



2019 Groundwater Monitoring Report

Stoney Lake Road Transfer Station

Township of Douro-Dummer

(PC of A No. A340901)

County of Peterborough

GHD | 347 Pido Road Unit 29 Peterborough Ontario K9J 6X7 Canada
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Table of Contents

1.	Introduction	1
2.	Background	1
3.	Site Conditions	2
3.1	General Geology	2
3.2	Monitoring Program	2
3.2.1	Groundwater	2
3.2.2	Surface Water	3
3.2.3	Landfill Gas	3
3.3	Pattern of Groundwater Movement.....	3
3.4	Horizontal Hydraulic Gradient.....	5
4.	Sampling/Monitoring Program	6
5.1	General	7
5.2	Groundwater Monitors	7
5.3	Reasonable Use Criteria	12
5.4	Surface Water Monitors	15
5.5	Surface Water Trigger Mechanism	17
5.6	Landfill Gas Monitoring	18
6.	Conclusions and Recommendations	19
6.1	Signatures	20

Table Index

Table 3.1	2019 Water Level Summary (Shallow Monitors)	4
Table 3.2	2019 Water Level Summary (Bedrock Monitors)	4
Table 3.3	Hydraulic Gradient Monitoring Wells	5
Table 5.1	May, 2019 Groundwater Quality Summary – Shallow Wells.....	8
Table 5.2	May, 2019 Groundwater Quality Summary – Deep Wells.....	9
Table 5.3	October 2019 Groundwater Quality Summary – Shallow Wells.....	10
Table 5.4	October 2019 Groundwater Quality Summary – Deep Wells	11
Table 5.5	Evaluation of Reasonable Use Criteria – May 2019 (Overburden and Shallow Bedrock Monitors).....	13
Table 5.6	Evaluation of Reasonable Use Criteria – May 2019 (Bedrock Monitors)	13



Table 5.7	Evaluation of Reasonable Use Criteria – October 2019 (Overburden and Shallow Bedrock Monitors).....	14
Table 5.8	Evaluation of Reasonable Use Criteria – October 2019 (Bedrock Monitors).....	14
Table 5.9	2019 Surface Water field Measurements	15
Table 5.10	2019 Landfill Perimeter and Trigger Station Surface Water Quality Results	16
Table 5.11	2019 Gas Monitoring	18

Appendices

Appendix A	MECP Provisional Certificates of Approval and MECP Correspondence
Appendix B	Monitoring Well Details and Borehole Data
Appendix C	Established Monitoring Program and Sampling Protocol
Appendix D	Water Levels, Alkalinity, Chloride and Iron Graphs
Appendix E	2019 Water Quality Data
Appendix F	Monitoring and Screening Checklist

Enclosures

Plate 1	Geologic Plan
Plate 2	Site Plan
Plate 3A	Plot Plan (Survey)
Plate 3B	Plot Plan (Property Boundary)
Plate 3C	Plot Plan (Monitoring Station Locations)
Plate 3D	Plot Plan (Shallow Groundwater Flow)
Plate 3E	Plot Plan (Bedrock Groundwater Flow)
Plate 4	2019 Field Monitoring Summary
Plate 5	2019 Water Level Monitoring Summary
Plate 6A	RUC Spring Summary
Plate 6B	RUC Fall Summary



1. Introduction

This report presents the results of the 2019 groundwater-monitoring program completed for the Stoney Lake Road Transfer Station in the Township of Douro-Dummer (formerly Township of Douro) in the County of Peterborough. The monitoring program was conducted in accordance with the scope of work as presented by our proposal dated January 15, 2009 as well as additional requirements outlined in the Ministry of the Environment, Conservation and Parks (MECP) review of AECOM Canada Ltd. "Stoney Lake Road Transfer Station, 2008 Annual Monitoring Report" and July 30, 2017 Memorandum.

2. Background

The Stoney Lake Road Transfer Station is situated along the north side of Stoney Lake Road (also known as County Road 6) 2.5km east of Highway 28. The Geologic Plan, Plate 1, illustrates the location of the landfill with respect to nearby roads and watercourses. The property is described as a 1.6 hectare (ha) refuse footprint situated within a 4.25 ha property in part of Lot 21, Concession 4 in the Township of Douro-Dummer.

The site is licensed under Amended Provisional Certificate of Approval (PC of A) No. A340901, issued in 2004, to receive municipal and solid waste, including large metal, brush, wood, tires, industrial, commercial and institutional waste, construction and demolition wastes. The site currently functions as a transfer station (Amended C of A 2007) and MECP Amendment dated March 5, 2013. A copy of the PC of A and its amendments is presented in Appendix A.

A MECP Memorandum dated July 30, 2015 provides commentary on the groundwater aspects of the 2013 monitoring program. Background data pertaining to the site was compiled prior to the commencement of the monitoring program in 2016. MECP comments were considered during the implementation of the 2019 sampling circuit.

Four (4) additional monitoring wells and two (2) landfill gas monitors (gas probes) were installed at the former landfill site in December 2014. Two (2) of the groundwater monitors replaced the background monitors while the two others were installed down gradient of the landfill in order to provide additional data. Well records for the monitors are included in Appendix B. The gas probes were advanced into the existing refuse. As indicated on the Well Records, a 0.3m thick clay layer was penetrated directly above the refuse that is interpreted to represent the cover material used for closure of the landfill.

Background data pertaining to the site was obtained from the AECOM Canada Ltd. (AECOM) 2008 report and the 2009 through to 2018 Geo-Logic Inc./GHD Reports. In general, the background data consisted of documents listed below:

1. Current PC of As issued by the MECP (Appendix A).



2. Excerpts from a report prepared by AECOM regarding details of the monitoring well construction and borehole records (Appendix B).
3. Monitoring program and sampling protocol established for the landfill site by the MECP Amended C of A No. A240901 dated September 24, 2003.
4. Reports prepared by AECOM dated 2007 and 2008 presenting the results of previous monitoring programs and Geo-Logic Inc./GHD 2009 through to 2018 reports.
5. MECP Memorandum by Mr. Greg Faaren, P.Geo. dated July 30, 2017.

3. Site Conditions

3.1 General Geology

The site is situated in an area within the physiographic region known as the Peterborough Drumlin Field (Chapman and Putnam, 1984). This region is characterized by northeast-to-southwest trending drumlin features. Bedrock underlying the site consists of limestone, with the minor shale of the Middle Ordovician Trenton-Black River Group.

Surface drainage at the site is southeast to towards the Galeburg Wetland. A minor tributary flows from the wetland into Sawers Creek, which eventually outlets into the Otonabee River.

3.2 Monitoring Program

3.2.1 Groundwater

In the past, sixteen (16) monitoring wells were utilized within the well monitoring program. Monitors TW-2-1, TW-2-2, TW-3-1, TW-3-2, TW-4-1, TW-4-2, TW-5-1 and TW-5-2 were installed within and adjacent to the refuse perimeter. Monitors TW-6-1, TW-6-2, TW-7-1 and TW-7-2, were installed near the down-gradient property boundary. Monitors TW-9-1 and TW-9-2 were installed south of Stoney Lake Road. Monitors TW-8-1 and TW-8-2 were installed up-gradient of the refuse footprint to serve as background monitors. Deeper bedrock monitors are designated as “-1” while shallower monitors are designated as “-2”.

In late 2014, two new wells were installed to replace the background monitors, TW-8-1 (previously abandoned) and TW-8-2 (always dry). The new wells are identified as TW-8-1 (2014) and TW-8-2 (2014). Two new shallow down-gradient monitoring wells were installed east of the landfill. These monitors are identified as TW-10-2 and TW-11-2. The shallow monitors were completed at or near the bedrock/overburden interface.

In the past wells within the landfill are analyzed for the indicator list of Landfill Standards Guidelines (Schedule 5 Column 2) while the down-gradient wells were analyzed for the comprehensive list (Schedule 5 Column 1). The 2014 MECP memorandum indicated that all shallow wells should be analyzed for the parameters of Schedule 5 Column 3, the Comprehensive list for Surface water.



Monitoring wells TW-3-2 and TW-4-2 were reported dry in past monitoring programs and were confirmed dry in the 2019 monitoring circuits. Monitors TW-3-1 and 10-2 had too little water to sample in the fall monitoring program. Background monitor TW 8-2 was dry during 2019 fall circuit. It had been dry for the previous 2 years. Should it continue to be dry in 2020, it is recommended that a new overburden background monitor be established.

There are no residential wells included in the monitoring program. Installation information and construction particulars for the monitoring wells are presented in Appendix B. The locations of the monitors are depicted on the Plot Plan, Plate 3C.

3.2.2 Surface Water

The surface water monitoring component of the annual monitoring program uses four (4) stations. SW 3 is located near the southwest corner of the property and is considered a receiving area for a portion of the surface water runoff. SW 6 is located along the east side adjacent to TW6. SW 1 is located at the wetland culvert approximately 300m east along Stoney Lake Road. This station is considered to be the trigger sampling point to monitor the impact of the surface water flowing down-gradient and away from the landfill property. The MECP has acknowledged that SW-1 will comprise the primary downstream trigger location. SW 8 is located in the wetland area 200m north of Stoney Lake Road and approximately 0.5km to the east of the landfill. This location is considered to be the background surface water station. The surface water locations are depicted on the Plot Plan, Plate 3C.

3.2.3 Landfill Gas

The landfill gas monitoring network of groundwater monitors listed in section 3.2.1 (twice per year). The location of the groundwater monitors are depicted on the Plot Plan, Plate 3C. Two new landfill gas monitors were installed in December 2014. In addition, measurements of gas were conducted within the on-site buildings. The measurements did not yield any detectable concentrations within any of the buildings. The results of the gas monitoring are summarized in section 5.6.

3.3 Pattern of Groundwater Movement

Groundwater level monitoring was conducted during the two sampling circuits in 2019. The water level data was acquired on May 29 and October 28. The measurements are presented on Plate 5 and summarized in Tables 3.1 and 3.2. Elevation data in the past was obtained from the AECOM 2007 monitoring report. After the installation of the new monitoring wells, Ontario Land Surveyors J.B. Fleguel Surveyors from Lakefield, Ontario was retained to establish new elevations for all wells. The results of the survey work are summarized on the Plot Plan, Plate 3A. The historical water levels have been updated to reflect the new elevations.

The shallow overburden groundwater monitoring data for 2019 is presented on Table 3.1. The direction of groundwater flow follows the general topography of the ground surface as illustrated on the Plot Plan, Plate 3D. Water levels are within the range reported in previous monitoring programs. Historical data from AECOM (2007-2008) are included in the report in Appendix D.



Table 3.1 2019 Water Level Summary (Shallow Monitors)

MONITOR NO.	ELEVATION TOP OF CASING*	MONITOR WATER LEVEL ELEVATION (masl)	
		May 29, 2019	October 28, 2019
TW-2-2	245.16	241.80	240.24
TW-5-2	241.40	238.53	237.66
TW-6-2	240.35	238.39	237.59
TW-7-2	239.86	237.76	237.59
TW-8-2 (2014)	245.34	242.90	Dry
TW-9-2	238.70	237.39	237.19
TW-10-2	241.20	239.04	237.80
TW-11-2	242.09	238.19	237.04

Notes: All measurements are presented in metres. Monitor top of casing elevations provided by J.B. Fleguel Land Surveyors 2014.

The bedrock groundwater monitoring data for 2019 is presented on Table 3.2. Based on the data, the pattern of bedrock groundwater movement appears to be in a southerly direction following the general topography of the land surface as illustrated on the Plot Plan, Plate 3E. Historical data from AECOM Canada Ltd. (2007-2008) are included in Appendix D.

Table 3.2 2019 Water Level Summary (Bedrock Monitors)

MONITOR NO.	ELEVATION TOP OF CASING*	MONITOR WATER LEVEL ELEVATION (masl)	
		May 29, 2019	October 28, 2019
TW 2-1	245.05	239.61	238.02
TW 3-1	244.84	239.76	237.03
TW 4-1	245.74	238.94	237.74
TW 5-1	241.40	238.42	237.71
TW 6-1	240.57	238.44	237.59
TW 7-1	245.37	238.35	237.69
TW 8-1(2014)	239.66	---	237.63
TW 9-1	238.53	238.38	237.75

Notes: All measurements are presented in metres. *Monitor top of casing elevations provided by J.B. Fleguel Land Surveyors.



3.4 Horizontal Hydraulic Gradient

Horizontal hydraulic gradient is the slope of the water table or potentiometric surface. It is the change in hydraulic head over the change in distance between the two monitoring wells or dh/dl . In mathematical terms, horizontal gradient is rise over run:

$$\begin{aligned} dh/dl &= \text{difference in head} / \text{horizontal distance between wells} \\ &= (h_2 - h_1) / L. \end{aligned}$$

All well locations were recorded using a handheld "Garmin" GPS unit and plotted on the Plot Plan, Plate 3C. The distances between the wells were measured using MNR Property Maps distance calibrator. Water level elevation was obtained from Table 3.1.

Three gradients for the June and October 2019 data sets were calculated for the shallow overburden wells. The average horizontal gradient for the shallow wells was 18.2 m/km in the May and 10.8 m/km in the October. The horizontal gradient for the deeper overburden wells was 4.8 m/km in May and 1.4 m/km in October of 2019. The results are summarized in Table 3.3.

Table 3.3 Hydraulic Gradient Monitoring Wells

Monitoring Wells	June / November	Groundwater Elevation (m)	Distance Between Wells (km)	Hydraulic Gradient (m/km)
Shallow Aquifer				
TW-2-2	May	242.80	0.199	22.2
TW-6-2		238.39		
TW-2-2	May	242.80	0.237	18.0
TW-5-2		238.53		
TW-2-2	May	242.80	0.371	14.6
TW-9-2		237.39		
Average-Shallow				18.2
Deeper Aquifer				
TW-2-1	May	239.64	0.199	6.0
TW-6-1		238.44		
TW-2-1	May	239.64	0.237	5.1
TW-5-1		238.42		
TW-2-1	May	239.64	0.371	3.4
TW-9-1		238.38		
Average - Deep				4.8
Shallow Aquifer				
TW-2-2	October	240.24	0.199	13.3
TW-6-2		237.59		
TW-2-2	October	240.24	0.237	10.9
TW-5-2		237.66		
TW-2-2	October	240.24	0.371	8.2



Table 3.3 Hydraulic Gradient Monitoring Wells

Monitoring Wells	June / November	Groundwater Elevation (m)	Distance Between Wells (km)	Hydraulic Gradient (m/km)
TW-9-2		237.19		
Average-Shallow				10.8
Deeper Aquifer				
TW-2-1	October	238.02	0.199	2.2
TW-6-1		237.59		
TW-2-1	October	238.02	0.237	1.3
TW-5-1		237.71		
TW-2-1	October	238.02	0.371	0.7
TW-9-1		237.75		
Average Deeper				1.4

4. Sampling/Monitoring Program

GHD followed the established sampling and monitoring protocol for the Stoney Lake Road Transfer Station. Details of this protocol are summarized in Appendix C. An overview of the protocol is presented as follows:

1. Fieldwork was carried out at ten (10) monitoring stations during the spring and fall season.
2. Four (4) surface water stations were sampled during the spring monitoring circuit. Two stations were monitored in September. The other stations were dry. Two (2) stations were sampled in October. The other stations were dry.
3. Methane and hydrogen sulphide gas generation was measured at each well using a 4 gas meter during sampling periods as well as the two newly installed monitoring stations and the on-site buildings.
4. Water levels were recorded for each monitor prior to well purging.
5. Three to five measured casing volumes were then removed from each monitor in order to ensure that representative groundwater samples were obtained.
6. In-situ chemical analyses were carried out during the purging operation in order to determine a stabilized water quality condition. The in-situ testing included temperature, conductivity, and pH.
7. After the purging operation, representative samples of groundwater were collected in proper containers with appropriate preservatives where needed.
8. The water samples were then delivered to SGS Laboratories for detailed chemical testing.



5. Water Quality Data

5.1 General

Representative groundwater samples from each of the monitors were subjected to chemical testing for specified parameters. The bedrock monitoring wells located within the former landfill area were tested for the indicator list of parameters listed in Schedule 5 Column 2 of the Landfill Standards Guidelines. The remaining bedrock monitoring wells were tested for the comprehensive list of parameters listed in Schedule 5 Column 1 of the Landfill Standards Guidelines. All shallow wells (-2 wells) were analyzed for the parameters of Schedule 5 Column 3 (comprehensive surface water list) of the Landfill Standards Guidelines.

In addition, samples from TW-2-2 and TW-6-2 were analyzed for volatile organic compounds (VOCs).

The surface water stations were analyzed for the parameters listed in Column 3 of Schedule 5 of the Landfill Standards Guideline (Comprehensive List for Surface Water).

5.2 Groundwater Monitors

The sampled monitors are categorized as: up-gradient shallow background monitor TW-8-2(2014) and background bedrock monitor TW-8-1 (2014); landfill monitors (TW-2, TW-3 and TW-4); and down-gradient monitors (TW-5, TW-6, TW-7, TW-9, TW-10 and TW-11). Monitors TW-5, TW-6, and TW-11 are directly adjacent to the refuse area. As in past years, monitors in the refuse area or directly adjacent to it reported the majority of values with exceedances compared to the Ontario Drinking Water Standards (ODWS) with the exception of TW-2-1 which met all parameters during both circuits. Down-gradient monitoring wells TW-7-1, TW-9-1 and 9-2 yielded samples that met the ODWS criteria for both circuits.

Parameters that reported values above the ODWS in one or both sampling circuits included Iron Alkalinity, Total Dissolved Solids (TDS), Sulphate, Ammonia, Manganese, Boron, Chloride and Dissolved Organic Carbon (DOC). In general, these results are similar in concentration than from past monitoring programs. Future monitoring programs should continue to monitor these parameters to evaluate the potential for environmental concern.

Down-gradient shallow and deep wells were also compared to Provincial Water Quality Objectives (PWQO). The exceedance were similar to the parameters previously listed as exceeding the ODWS. Future monitoring programs should continue to monitor these parameters to evaluate the potential for environmental concern. The chemical results from the monitoring wells where samples were obtained have been summarized in Table 5.1 - 5.4. The data is presented with the ODWS for comparison purposes. The certificates of analysis are included in Appendix E. chemical comparison graphs are presented in Appendix D.



Table 5.1 May, 2019 Groundwater Quality Summary – Shallow Wells

PARAMETERS	Stony Lake Road Landfill Site Monitors								ODWS	PWQO
	TW 2-2	TW 5-2	TW 6-2	TW 7-2	TW 9-2	TW 10-2	TW 11-2	Background TW 8-2 2018		
May 29, 2019										
BOD	< 4	< 4	< 4	< 4	4	< 4	< 4	< 4	---	---
TSS	32	86	7	224	2210	355	437	35	---	---
Alkalinity	398	322	276	382	340	628	303	229	30-500	---
pH	7.47	7.33	8.04	7.07	7.96	7.49	7.50	8.18	6.5-8.5	6.5-8.5
Conductivity	882	2070	572	2140	448	1170	516	422	---	---
TDS	251	1900	489	1590	274	606	311	234	500	---
COD	< 8	16	< 8	11	< 8	35	< 8	< 8	---	---
Phosphorus	< 0.03	0.03	< 0.03	0.22	0.73	0.13	0.36	< 0.03	---	---
TKN	< 0.5	< 0.5	0.6	< 0.5	< 0.5	26.7	0.6	< 0.5	---	---
Ammonia	< 0.1	< 0.1	0.4	0.2	0.2	27.6	< 0.1	< 0.1	---	**3.3
Phenolics	0.001	0.003	<0.001	0.007	<0.001	0.004	0.002	< 0.001	---	0.005
Sulphate	6	880	23	520	15	8	9	8	500	--
Chloride	2	140	5	280	4	28	3	2	250	---
Nitrite	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	1.0	---
Nitrate	0.36	2.62	1.98	< 0.06	0.20	< 0.06	2.14	0.61	10	---
Mercury	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Arsenic	<0.0002	0.0003	<0.0002	0.0012	0.0004	0.0016	<0.0002	< 0.0002	0.002	0.05
Barium	0.0287	0.0254	0.114	0.128	0.487	0.398	0.0283	0.0293	200	---
Boron	0.160	49.6	0.080	1.25	0.026	0.431	0.047	0.013	1.0	0.2
Calcium	107	351	112	339	281	197	118	98.3	---	---
Cadmium	0.000003	0.000006	0.000007	0.000004	0.000064	0.000010	0.000003	< 0.000003	0.005	0.0002
Chromium	0.00013	0.00031	0.00012	0.00014	0.00401	0.00092	0.00016	0.00020	0.05	---
Cooper	0.0007	0.0051	0.0009	0.0012	0.0081	0.0020	0.0010	0.0007	1.0	0.005
Iron	0.106	0.440	0.011	8.41	2.82	41.3	0.067	0.020	0.3	0.3
Potassium	0.780	1.55	2.32	2.46	1.10	19.7	0.814	0.444	---	---
Magnesium	3.19	113	5.33	41.0	8.30	15.8	1.87	2.82	---	----
Manganese	8	0.0442	0.463	2.47	0.273	2.49	0.00169	0.00091	0.05	----
Sodium	2.34	108	7.51	127	3.00	28.2	2.61	2.86	200	---
Lead	0.00001	0.00015	0.00001	0.00001	0.00249	0.00129	0.00003	0.00002	0.01	0.005
Zinc	0.002	0.004	<0.002	0.004	0.017	0.019	0.004	0.003	5	0.02

All results in mg/L with the exception of Conductivity (uS/cm) and pH.

<0 **Highlighted** indicates an exceedance of the ODWS (Ontario Drinking Water Standards and/ or PWQO (Provincial water Quality Objectives)).

** Ammonia value based on 7.5 pH at 10° Celsius



Table 5.2 May, 2019 Groundwater Quality Summary – Deep Wells

PARAMETERS	Stony Lake Road Landfill Site Monitors								ODWS	PWQO
	TW 2-1	TW 3-1	TW 4-1	TW 5-1	TW 6-1	TW 7-1	TW 9-1	Background		
								TW-8-1 2018		
May 29, 2019										
Alkalinity	228	483	272	451	399	244	251	dry	30-500	---
pH	8.12	7.11	8.01	7.08	7.71	7.85	7.90		6.5-8.5	6.5-8.5
Conductivity	451	822	529	2570	817	528	544		---	---
TDS	260	389	280	2390	509	283	300		500	---
COD	< 8	78	< 8	32	< 8	< 8	< 8		---	---
Phosphorus					< 0.03	< 0.03	< 0.03		---	---
TKN					0.8	< 0.5	< 0.5		---	---
Ammonia	< 0.1	21.3	< 0.1	0.7	0.6	< 0.1	< 0.1		---	3.3**
Phenolics					< 0.002	< 0.002	< 0.002		---	0.005
Sulphate	3	9	9	950	12	18	27		500	--
Chloride	3	19	3	160	5	12	18		250	---
Nitrite					0.16	< 0.03	< 0.03		1.0	---
Nitrate	0.96	< 0.06	1.87	< 0.06	2.58	< 0.06	< 0.06		10	---
DOC	1	6	2	12	2	2	1		5	6
Mercury	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01			
Arsenic	< 0.0002	0.0130	< 0.0002	0.0004	< 0.0002	< 0.0002	< 0.0002		0.002	0.05
Barium	0.0192	0.639	0.0190	0.0273	0.117	0.174	0.110		200	---
Boron	0.007	0.266	0.012	1.49	0.023	0.024	0.022		1.0	0.2
Calcium	102	135	120	475	115	102	114		---	---
Cadmium	0.000004	0.000009	<0.000003	<0.000003	0.000016	0.000003	<0.000003		0.005	0.0002
Chromium	0.00016	0.00371	0.00014	0.00025	0.00011	0.00012	0.00034		0.05	---
Cooper	0.0007	0.0009	0.0009	0.0023	0.0010	0.0018	0.0008		1.0	0.005
Iron	0.007	140	0.042	6.36	0.012	0.015	0.009		0.3	0.3
Potassium	0.671	13.9	0.820	4.92	2.33	1.21	1.24		---	---
Magnesium	2.06	10.0	1.88	48.0	3.65	4.86	5.29		---	---
Manganese	0.00011	0.646	0.00053	0.852	0.568	0.00239	0.00194		0.05	---
Sodium	2.19	18.6	2.75	82.9	4.20	8.40	8.59		200	---
Lead	0.00001	0.00049	0.00002	0.00002	< 0.003	< 0.003	< 0.003		0.01	0.005
Zinc	0.002	0.006	0.003	0.003	0.00002	0.00005	0.00001		5.0	0.03

All results in mg/L with the exception of Conductivity (uS/cm) and pH.

Highlighted indicates an exceedance of the ODWS (Ontario Drinking Water Standards and/

** Ammonia value based on 7.5 pH at 10° Celsius



Table 5.3 October 2019 Groundwater Quality Summary – Shallow Wells

PARAMETERS	Stony Lake Road Landfill Site Monitors								ODWS	PWQO
	TW 2-2	TW 5-2	TW 6-2	TW 7-2	TW 9-2	TW 10-2	TW 11-2	Background TW 8-2 2018		
October 28, 2019										
BOD	<4	<4	<4	<4	<4	Dry	<4	Dry		
TSS	3	4	3	19	< 2		108		---	---
Alkalinity	569	493	415	345	215		646		30-500	---
pH	7.53	7.76	7.77	7.78	8.26		7.06		6.5-8.5	6.5-8.5
Conductivity	1480	3810	1350	1730	384		1560		---	---
TDS	1140	3690	909	1320	291		891		500	---
COD	25	45	11	13	< 8		51		---	---
Phosphorus	0.03	0.10	0.03	0.04	< 0.03		< 0.03		---	---
TKN	< 0.5	0.7	0.6	< 0.5	< 0.5		31.8			
Ammonia	< 0.1	< 0.1	0.7	0.2	0.1		33.4		---	**3.3
Phenolics	0.003	0.008	0.004	0.002	< 0.001		0.004		---	0.005
Sulphate	320	2200	140	460	10		170		500	--
Chloride	20	210	110	130	4		56		250	---
Nitrite	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03		< 0.03		1.0	---
Nitrate	< 0.06	5.89	0.15	< 0.06	0.09		< 0.06		10	---
Mercury	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		---	---
Arsenic	0.0008	0.0005	< 0.0002	0.0007	< 0.0002		0.0005		0.002	0.05
Barium	0.125	0.0249	0.287	0.0965	0.210		0.404		200	---
Boron	0.236	10.2	0.359	1.49	0.011		0.371		1.0	0.2
Calcium	358	561	252	263	86.8		212		---	---
Cadmium	0.000019	0.000014	0.000012	0.000005	<0.000003		0.000011		0.005	0.0002
Chromium	0.00034	0.00033	0.00014	0.00015	0.00009		0.00041		0.05	---
Cooper	0.0008	0.0226	0.0019	0.0003	0.0007		0.0008		1.0	0.005
Iron	0.068	0.011	0.010	0.267	0.017		8.11		0.3	0.3
Potassium	1.01	2.61	4.39	2.48	0.723		29.2		---	---
Magnesium	14.8	210	15.1	30.5	2.87		24.5		---	----
Manganese	2.41	0.0529	1.32	2.25	0.00726		1.52		0.05	----
Sodium	15.8	206	36.6	123	3.09		49.9		200	---
Lead	0.00003	0.00063	0.00003	0.00003	0.00004		0.00004		0.01	0.005
Zinc	0.004	0.011	0.002	0.005	0.009		0.004		5.0	0.03

All results in mg/L with the exception of Conductivity (uS/cm) and pH.

Highlighted indicates an exceedance of the ODWS (Ontario Drinking Water Standards and/ or PWQO (Provincial water Quality Objectives)).

** Ammonia value based on 7.5 pH at 10o Celsius



Table 5.4 October 2019 Groundwater Quality Summary – Deep Wells

PARAMETERS	Stony Lake Road Landfill Site Monitors								ODWS	PWQO
	TW 2-1	TW 3-1	TW 4-1	TW 5-1	TW 6-1	TW 7-1	TW 9-1	Background		
								TW-8-1 2018		
October 28, 2019										
Alkalinity	252	dry	436	413	534	231	237	247	30-500	---
pH	8.02		7.72	7.62	7.80	8.07	8.02	8.03	6.5-8.5	6.5-8.5
Conductivity	581		1360	2800	1270	513	543	522	---	---
TDS	334		966	2670	806	303	303	297	500	---
COD	< 8		24	25	16	8	< 8	< 8	---	---
Phosphorus	< 0.003		0.013	0.003	0.03	< 0.03	< 0.03	0.14	---	---
TKN					6.4	< 0.5	< 0.5	< 0.5	---	---
Ammonia	< 0.1		0.2	0.6	5.4	< 0.1	< 0.1	< 0.1	---	3.3**
Phenolics					< 0.002	< 0.002	< 0.002	< 0.002	---	0.005
Sulphate	7		340	1100	110	17	28	7	500	--
Chloride	8		43	170	55	13	18	7	250	---
Nitrite					< 0.03	< 0.03	< 0.03	< 0.03	1.0	---
Nitrate	3.71		1.33	< 0.06	0.08	< 0.06	< 0.06	1.21	10	---
DOC	< 1		8	11	8	< 1	< 1	< 1	5	6
Mercury					< 0.01	< 0.01	< 0.01	< 0.01		
Arsenic	< 0.0002		0.0004	< 0.0002	0.0006	< 0.0002	< 0.0002	0.0009	0.002	0.05
Barium	0.0230		0.0701	0.00597	0.393	0.0157	0.109	0.0611	200	---
Boron	0.008		0.090	0.374	0.145	0.002	0.025	0.015	1.0	0.2
Calcium	112		305	57.9	253	14.1	108	120	---	---
Cadmium	<0.00003		0.000004	<0.00003	0.000056	0.000003	0.000010	0.000017	0.005	0.0002
Chromium	0.00024		0.00039	< 0.00008	0.00032	<0.00008	0.00015	0.00127	0.05	---
Cooper	0.0006		0.0012	< 0.0002	0.0010	< 0.0002	0.0008	0.0027	1.0	0.005
Iron	0.129		0.077	1.45	0.221	< 0.007	0.007	1.05	0.3	0.3
Potassium	0.771		1.91	0.573	8.14	0.120	1.84	1.37	---	---
Magnesium	2.10		7.31	7.95	13.6	0.668	5.10	2.98	---	---
Manganese	0.00054		0.0313	0.117	4.36	0.00057	0.00340	0.0863	0.05	---
Sodium	4.62		31.0	11.7	38.0	1.30	9.64	3.34	200	---
Lead	0.00004		0.00011	< 0.00001	0.00034	0.00001	0.00002	0.00107	0.01	0.005
Zinc	0.003		0.004	< 0.002	0.003	< 0.002	0.003	0.022	5.0	0.03

All results in mg/L with the exception of Conductivity (uS/cm) and pH.

Highlighted indicates an exceedance of the ODWS (Ontario Drinking Water Standards) and/ or PWQO.

** Ammonia value based on 7.5 pH at 10o Celsius

In accordance with the PC of A (September 24, 2003), monitors TW-2-2 and TW-6-2 were sampled for VOC analysis. All parameters tested were reported with values below their respective detection limits in both the spring and fall. Monitors that were analyzed for Column 1 parameters reported values below their respective detection limits in both the spring and fall. All values were within the ODWS.

This should be closely monitored to see if there is a reoccurrence in the 2019 monitoring program. The certificates of analysis are included in Appendix E.



5.3 Reasonable Use Criteria

At the request of the MECP, the transfer station was assessed for its conformance with Guideline B-7 as a reasonable use criteria (RUC) assessment. This monitoring report presents estimated criteria for significant contaminant indicators. The criteria establish the maximum acceptable concentrations of various parameters at the property boundary permitted by MECP Procedure B-7-1. An evaluation of the RUC criteria was conducted using the 2019 data. The criterion is based on the following equation.

$$X = B + F (W - B)$$

where: X = maximum acceptable concentration at property boundary

B = background concentration of parameter

F = factor of 0.5 for aesthetic parameter and 0.25 for health related parameter

W = ODWS value for each particular parameter

The RUC was applied to leachate parameters. Water quality for the monitors utilized the chemical results from the shallow overburden / shallow bedrock monitors at stations at the down-gradient locations (TW-6-2, TW-7-2, TW-9-2, TW-10-2 and TW-11-2) and the deeper bedrock monitoring stations (TW-6-1, TW-7-1 and TW-9-1). Background monitor TW-8-1 and TW-8-2 were established as the background monitors as they are located the farthest up-gradient of the site and the shallow groundwater movement has been established to flow away from this location. The RUC calculations for the site are presented in Tables 5.5 to 5.8.



Table 5.5 Evaluation of Reasonable Use Criteria – May 2019 (Overburden and Shallow Bedrock Monitors)

Parameter (mg/L)	ODWS (MAC or IMAC)	TW-8-2 May 2019	Monitoring Wells					Calculated RUP (mg/L)*
			TW-6-2	TW-7-2	TW-9-2	TW-10-2	TW-11-2	
Alkalinity	500	229	276	224	2210	355	437	364.50
Barium	1	0.0293	0.11	0.13	0.49	0.40	0.03	0.51
Boron	5	0.013	0.08	1.25	0.03	0.43	0.05	2.51
Chloride	250	2	5	280	4	28	3	126.00
Iron	0.3	0.02	0.01	8.41	2.82	41.30	0.07	0.16
Manganese	0.05	0.00091	0.46	2.47	0.27	2.49	0.00	0.03
TDS	500	234	489	1590	274	606	311	367.00
Nitrate	10	0.61	1.98	< 0.06	0.20	< 0.06	2.14	5.31
Sodium	200	2.86	7.51	127.00	3.00	28.20	2.61	101.43
Sulphate	500	8	23	520	15	8	9	254.00

*RUC is calculated as background+Fx(ODWS-TW-8) where F=0.5 for aesthetic parameter and 0.25 for health related parameter. All results in mg/L with the exception of Conductivity (uS/cm) and pH. Highlighted indicates an exceedance.

Table 5.6 Evaluation of Reasonable Use Criteria – May 2019 (Bedrock Monitors)

Parameter (mg/L)	ODWS (MAC or IMAC)	TW-8-1 (Nov. 2018)	Monitoring Wells			Calculated RUP (mg/L)*
			TW-6-1	TW-7-1	TW-9-1	
Alkalinity	500	234.00	399	244	251	367.00
Barium	1	0.04	0.117	0.174	0.11	0.52
Boron	5	0.04	0.023	0.024	0.022	2.52
Chloride	250	2.00	5	12	18	126.00
Iron	0.3	0.14	0.012	0.015	0.009	0.22
Manganese	0.05	0.01	0.568	0.00239	0.00194	0.03
TDS	500	269.00	509	283	300	384.50
Nitrate	10	0.61	2.58	< 0.06	< 0.06	5.31
Sodium	200	1.90	4.2	8.4	8.59	100.95
Sulphate	500	4.00	12	18	27	252.00

*RUC is calculated as background+Fx(ODWS-TW-8) where F=0.5 for aesthetic parameter and 0.25 for health related parameter. All results in mg/L with the exception of Conductivity (uS/cm) and pH. Highlighted indicates an exceedance.



Table 5.7 Evaluation of Reasonable Use Criteria – October 2019 (Overburden and Shallow Bedrock Monitors)

Parameter (mg/L)	ODWS (MAC or IMAC)	TW-8-2 May 2019	Monitoring Wells					Calculated RUP (mg/L)*
			TW-6-2	TW-7-2	TW-9-2	TW-10-2	TW-11-2	
Alkalinity	500	229	415	345	215	Dry	646	364.50
Barium	1	0.0293	0.287	0.0965	0.210		0.404	0.51
Boron	5	0.013	0.359	1.49	0.011		0.371	2.51
Chloride	250	2	110	130	4		56	126.00
Iron	0.3	0.02	0.10	0.267	0.017		8.11	0.16
Manganese	0.05	0.00091	1.32	2.25	0.00726		1.52	0.03
TDS	500	234	909	1320	291		891	367.00
Nitrate	10	0.61	<0.01	< 0.01	<0.01		<0.01	5.31
Sodium	200	2.86	36.6	123	3.09		49.9	101.43
Sulphate	500	8	140	460	10		170	254.00

*RUC is calculated as background+Fx(ODWS-TW-8) where F=0.5 for aesthetic parameter and 0.25 for health related parameter. All results in mg/L with the exception of Conductivity (uS/cm) and pH. Highlighted indicates an exceedance.

Table 5.8 Evaluation of Reasonable Use Criteria – October 2019 (Bedrock Monitors)

Parameter (mg/L)	ODWS (MAC or IMAC)	TW-8-1 October 2019	Monitoring Wells			Calculated RUP (mg/L)*
			TW-6-1	TW-7-1	TW-9-1	
Alkalinity	500	247	534	231	237	373.50
Barium	1	0.0611	0.393	0.0157	0.11	0.53
Boron	5	0.015	0.145	0.002	0.03	2.51
Chloride	250	7	55	13	18	128.50
Iron	0.3	1.05	0.221	< 0.007	0.01	0.68
Manganese	0.05	0.0863	4.36	0.00057	0.00	0.07
TDS	500	297	806	303	303	398.50
Nitrate	10	1.21	0.08	< 0.06	< 0.06	5.61
Sodium	200	3.34	38	1.3	9.64	101.67
Sulphate	500	7	110	17	28	253.50

*RUC is calculated as background+Fx(ODWS-TW-8) where F=0.5 for aesthetic parameter and 0.25 for health related parameter. All results in mg/L with the exception of Conductivity (uS/cm) and pH. Highlighted indicates an exceedance.

The shallow monitors yielded results that exceeded the RUC criteria in monitors TW-6-2, 7-2, 9-2, 10-2 and TW 11-2 for parameters including Alkalinity, Chloride, Iron, TDS and Manganese. This is similar to previous years. It is interpreted that the organics associated with the existing wetland that abuts the east and southern property limits is impacting the water quality at locations down-gradient of the refuse area. In addition, it is unclear if the farming operations that border the property to the north and west are contributing to the adverse water quality. Nevertheless, it is recommended that the existing monitoring program be continued in order to evaluate if off-site impacts are occurring.



The deeper monitors yielded groundwater samples with an RUC exceedance limited to 6-1 for TDS, Alkalinity and Manganese. TW 6-1 has in the past reported exceedances of the RUC. The data suggests that the existing refuse is having a minimal impact on the deeper bedrock aquifer complex.

5.4 Surface Water Monitors

Surface water samples were collected during spring, summer and fall sampling periods. In-field measurements were taken at the surface water station as presented in Table 5.9. SW-6 was dry during all sampling circuits while SW-3 was dry in August and November. SW-8 was dry in August. The certificates of analysis are included in Appendix E.

Table 5.9 2019 Surface Water field Measurements

Parameter	Field Measurement							
	SW-1			SW-3	SW-6	SW-8		
	May	Sep.	Oct.	May	May	May	Sep.	Oct.
Temperature (°C)	13.0	21.2	11.8	13.1	12.1	16.1	24.4	11.6
pH	7.74	7.38	7.71	7.95	7.63	7.78	8.45	7.90
Conductivity (us/cm)	324	7.49	411	586	656	480	323	305
Dissolved Oxygen (mg/L)	6.30	4.57	5.98	9.20	9.24	9.40	7.81	8.86
ORP	111	---	225	115	115	140	---	203

Guideline B-9 does not apply as the landfill is closed. Based on the fact that no groundwater source exists between the landfill and the wetland, Guideline B-9 is interpreted to be met. However, Guideline B-9 does not supersede PWQO as the landfill discharge must not impact the adjacent surface water feature.

As such, surface water quality at the landfill perimeter stations SW 3 and SW-6 as well as trigger station SW 1 were compared to the PWQO to assess the landfill compliance. The MOE “Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water – Technical Guidance Document” (November 2010) indicates assessments should compare values to those on Table A and B of the document. The values on these charts are obtained from the Aquatic Protection Value (APV) and the Canadian Water Quality Objective (CWQO).

The surface water samples were submitted for analysis of Schedule 5 Column 3 of the Landfill Standards Guideline (Comprehensive List for Surface Water). The results of the analysis are included in Appendix E and the data are summarized in Table 5.10.



Table 5.10 2019 Landfill Perimeter and Trigger Station Surface Water Quality Results

Parameters	Surface Water Locations								APV	CWQO	PWQO
	SW-1			SW-3	SW-6	SW-8					
	May	Sep.	Oct.	May	May	May	Sep.	Oct.			
BOD	< 4	5	< 4	< 4	< 4	< 4	34	< 4			
TSS	14	13	2	2	3	8	83	3			
Alkalinity (mg/L)	204	273	164	251	417	195	168	139			---
pH	8.17	8.00	8.17	8.17	7.69	7.71	8.64	7.82		6.0-9.0	6.5-8.5
Conductivity	407	543	402	724	860	558	358	372			
TDS	206	329	286	426	491	303	300	274			
COD	19	27	27	14	17	19	70	30			
Phosphorus	< 0.003	0.037	0.014	0.137	0.036	0.028	0.286	0.026			3.3
TKN	< 0.5	0.9	< 0.5	< 0.5	2.4	0.7	1.7	< 0.5			
Ammonia	< 0.1	0.2	< 0.1	< 0.1	1.6	< 0.1	< 0.1	< 0.1			
Phenolics	0.003	0.006	< 0.001	0.004	0.003	0.004	0.009	0.003	0.04**	0.004	0.005
Sulphate	6	3	33	53	41	< 2	3	32			
Chloride	12	13	24	62	19	63	16	22	180	128	---
Nitrite	< 0.03	< 0.03	< 0.03	< 0.03	0.03	< 0.03	< 0.03	< 0.03		0.06	
Nitrate	< 0.06	< 0.06	< 0.06	< 0.06	0.52	< 0.06	< 0.06	1.65		2.9	
Mercury	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.26		
Arsenic	0.0002	0.0005	0.0005	0.0002	0.0004	0.0002	0.0026	0.0005	0.150	0.0005	
Barium	0.0608	0.0955	0.0599	0.0577	0.110	0.0513	0.0880	0.0605	2.30		
Boron	0.016	0.034	0.018	0.126	0.189	0.011	0.030	0.015	3.55	1.50	0.2
Calcium	70.8	117	81.0	113	164	74.8	71.6	68.9			
Cadmium	<0.00003	0.000019	0.000003	0.000003	0.000005	0.000006	0.000010	0.000098	0.00021	0.000017	0.0005
Chromium	0.00011	0.00021	0.00015	0.00024	0.00071	0.00015	0.00014	0.00017	0.064		
Copper	< 0.0002	0.0009	0.0005	0.0008	0.0008	< 0.0002	0.0006	0.0004	0.0069		0.005
Iron (mg/L)	0.071	1.51	0.106	0.064	1.05	0.067	1.23	0.036	1.00*	0.3	0.3
Potassium	0.581	0.660	2.06	1.68	10.4	1.30	8.64	1.97			
Magnesium	1.96	2.81	2.39	6.71	11.6	1.81	2.95	2.31			
Manganese	0.0193	0.639	0.0168	0.00770	1.35	0.0211	0.494	0.0101			
Sodium	6.56	7.64	10.9	28.4	21.2	35.3	5.86	8.62			
Lead	<0.00001	0.00009	0.00012	<0.00001	0.00016	0.00008	0.00038	0.00015	0.02		0.005
Zinc	0.002	0.009	<0.002	0.004	0.005	0.003	0.004	<0.002	0.089	0.03	0.02

Highlighted indicates exceedance of PWQO, * USA EPA Criterion, ** Lowest observed effect criterion

All results in mg/L with the exception of Conductivity (uS/cm) and pH.

PWQO=Provincial Water Quality Objective, CWQO=Canadian Water Quality Objective, APV=Aquatic Protection Value.

Trigger location SW 1 experienced an exceedance of the PWQO for iron and Phenolics in the Sep.2 sampling period but not in May or October. Both times the background monitor SW-8 also exceeded the PWQO. Iron should be monitored during the 2021 program to see if a trend is developing.



5.5 Surface Water Trigger Mechanism

As in past reports, the surface water trigger criteria at SW-1 should comprise those listed in Table 5.10. An exceedance for any listed parameter at SW-1 should be defined as the numerical elevation of an analytical value above the trigger concentration calculated from the 75th percentile at the background station SW 8.

Three consecutive annual exceedances for any sampled parameters at SW-1 that is considered to be caused by the Stoney Lake Road Transfer Station should trigger the preparation of a contingency plan to be submitted to the MECP after the receipt of the third consecutive exceedance analysis. This should continue to be reviewed on an annual basis. The contingency plan is based on a three tier system as outlined below.

Tier 1- Alert: This is an alert level monitoring mode. If a parameter exceeds the PWQO for 3 consecutive sampling events, then the Tier 2 trigger monitoring mode would be initiated.

Tier 2- Confirmation: This mode includes increased monitoring which includes: increased sampling frequency; a confirmation of the exceedance; and a discussion with the concerned parties. Samples would be required to be taken monthly for 3 months from the background location and the location where the exceedance(s) occurred. The tier 2 monitoring is conducted to provide an assessment of whether an observed exceedance of the trigger is in fact due to landfill impact as a whole, or whether the exceedance of the trigger is partly or wholly explained by other factors. This will be achieved by considering trends in the trigger parameter concentrations at the trigger location in the context of:

- Trigger parameter concentrations at non-trigger locations, i.e. other sampling locations; and
- Non-trigger leachate indicator parameter concentrations at trigger and non-trigger locations.

If the exceedance is confirmed, discussions will be held with the municipality and the MECP to decide whether implementation of remedial measures is warranted. This meeting should take place within 6 months from the activation of the tier 2 trigger. The discussions will define the optimum course of action and review the remedial measures alternatives available to the municipality at that time.

The course of action should be commenced by the initiation of a detailed surface water/biological study to determine if the trigger exceedances caused acceptable or unacceptable quality/biological impacts on the receiving watercourse. The plan should provide recommendations for: 1) the site closure or continued operation with the design/construction of appropriate engineered facilities (such as leachate collection and treatment works, surface water drainage control, low permeability soil and geotextile capping on the refuse footprint); 2) the timing for the installation of the recommended facilities; and 3) the subsequent quality monitoring to confirm the acceptable water conditions. If acceptable impact is demonstrated by the surface water/biological study, the MECP would be requested to support the continuance of the routine sampling without mitigation regarding the specific trigger exceedance.



If however, unacceptable impact is demonstrated by the surface water/biological study, the implementation of the remedial plan should commence shortly after the receipt of the next exceedance analysis for the trigger parameter during any routine sampling survey.

Tier 3- Compliance: This mode initiates the implementation of the remedial measures and assesses the effectiveness of the implemented contingency works. The scope of the monitoring will be established following the remedial measures proposed to be undertaken.

SW-1 experienced an exceedance for iron and phenolics in the Sep. sampling. The spring and fall result did not experience an exceedance, therefore the surface water trigger criteria was not triggered. The background monitor also exceeded for phenolics and iron in the Sep. sampling. It is our professional opinion that the iron and phenolics exceedances are not related to the Stoney Lake Road Transfer Station and should not be considered as part of the trigger mechanism. It is our opinion that the trigger mechanism was not exceeded during the 2019 monitoring period.

5.6 Landfill Gas Monitoring

Landfill gas monitoring was conducted in May and October, at each monitoring well location using a 4 gas meter for methane and hydrogen sulphide. Hydrogen sulphide was also measured but none was detected in any of the wells or monitors. Methane was detected in TW-3-1 and TW-11-2 during the fall circuit but not in the spring. The level of methane detected ranged from 3- 9% by volume. The results of the monitoring are included in Table 5.11. New Methane gas probes were inserted into the landfill in December of 2015 within the refuse area above the water table. Readings for the probes ranged from 8 to 35%. Methane monitoring was also conducted at the on-site buildings. No methane gas was measured in any of the buildings.

Table 5.11 2019 Gas Monitoring

Monitor ID	Stoney Lake Road Transfer Station Monitors	
	May 2019 (% by volume)	October 2019 (% by volume)
TW-2-1	0	0
TW-2-2	0	0
TW-3-1	0	3
TW-3-2	0	0
TW-4-1	0	0
TW-4-2	0	0
TW-5-1	0	0
TW-5-2	0	0
TW-6-1	0	0
TW-6-2	0	0
TW-7-1	0	0
TW-7-2	0	0
TW 8-1 2014	0	0
TW-8-2 2014	0	0
TW-9-1	0	0
TW-9-2	0	0



Table 5.11 2019 Gas Monitoring

Monitor ID	Stoney Lake Road Transfer Station Monitors	
	May 2019 (% by volume)	October 2019 (% by volume)
TW-10-2	0	0
TW-11-2	0	9
GP-1	35	18
GP-2	20	8
Office	0	0
Sorting Building	0	0

*Monitoring wells are screened at water table. Gas Probes (GP) are screened in the refuse area above the water table

The concentration limits specified in the C of A and MECP Regulations are:

- less than 2.5 percent methane gas in the subsurface at the property boundary,
- less than 1.0 percent methane in an on-site building, or its foundation, and
- less than 0.05 percent methane (i.e. not present) in a building, or its foundation, which is located off-site.

These detected levels are below the MECP guideline criteria.

6. Conclusions and Recommendations

This report presents the results of the 2019 groundwater monitoring program completed at the Stoney Lake Road Transfer Station in the Township of Douro-Dummer. It is our professional opinion that the groundwater level and chemical data do not indicate a significant anomaly from the results from previous years. Chloride levels in the refuse monitors at MW-2 and MW-5 seem to be trending upwards and is likely related to use of deicing agents during winter months for the site activities.

The majority of the parameters are within their acceptable limits with a few exceedances in the monitors located adjacent to the refuse area as determined by MECP Policy B-7.

Future monitoring programs should consider the following recommendations.

1. The monitoring wells located within the former landfill area should continue to be tested for the indicator list of parameters listed in Schedule 5 Column 2 of the Landfill Standards Guidelines. The remaining monitoring wells should continue to be tested for the comprehensive list of parameters listed in Schedule 5 Column 1 of the Landfill Standards Guidelines. All shallow wells (-2 wells) should continue to be analyzed for the parameters of Schedule 5 Column 3 (comprehensive surface water list) of the Landfill Standards Guidelines.
2. Surface water samples should be tested for the surface water comprehensive list of parameters listed in Schedule 5 Column 3 of the Landfill Standards Guidelines.



3. Sampling should continue for VOCs for the wells listed in the 2004 PC of A.
4. Surface water results should continue to be compared with PWQO criteria.
5. Groundwater, surface water and landfill gas sampling should continue at the same frequency as in 2019.
6. Background Monitor TW 8-2 was again dry in the fall of 2019. If it continues to be dry in 2020 it is recommended that a new overburden background monitor be established.

6.1 Signatures

We trust that this report meets with your immediate requirements. Should you have any questions, please contact our office.

Sincerely,

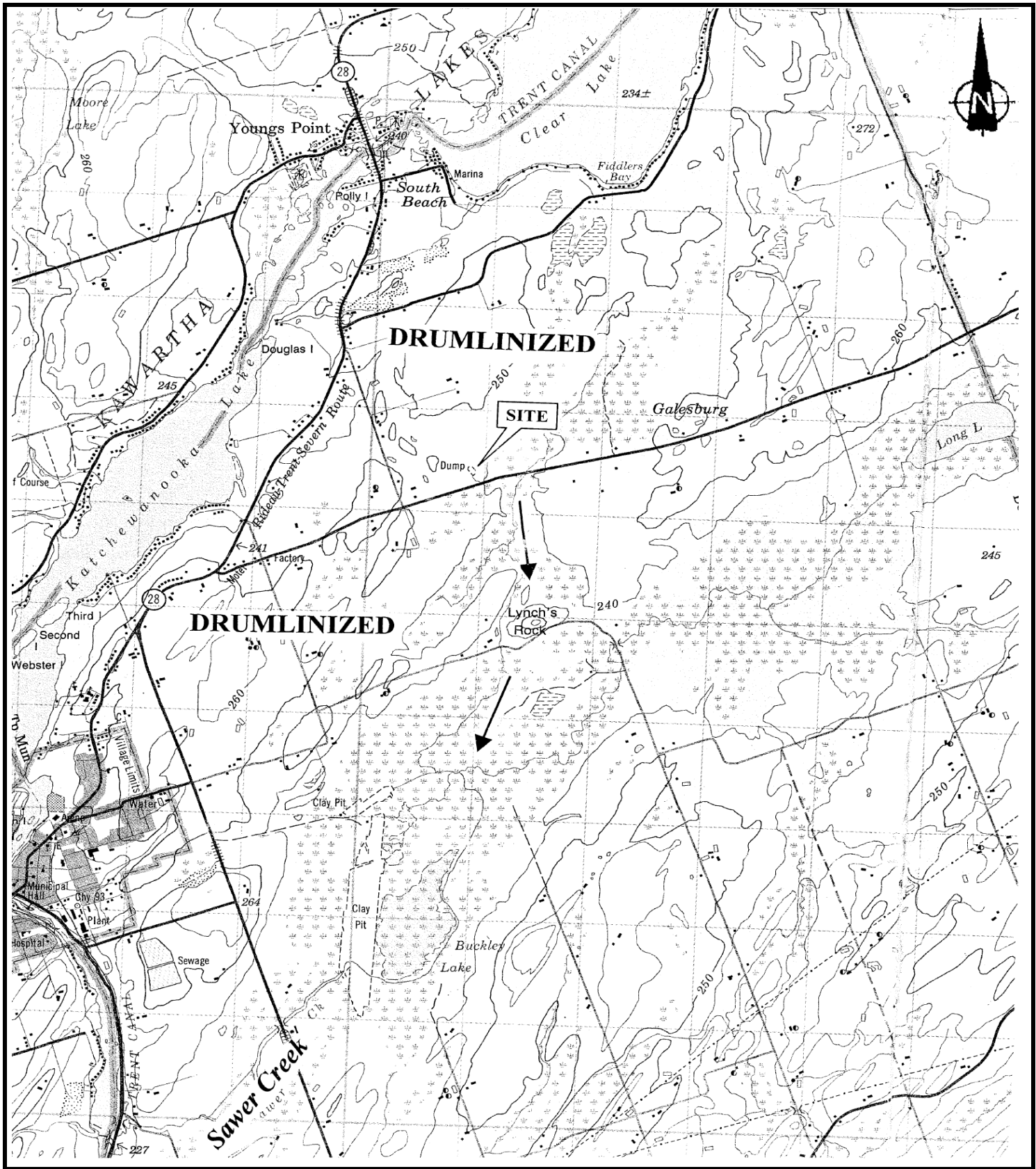
GHD

Steven Gagne, H.B.Sc.

Nyle McIlveen, P.Eng.



Enclosures



Base map compiled from Energy, Mines and Resources Canada Map 31 D/8 dated 1985. Air photography dated 1981.

Scale:
1:10000
Coordinate System
NAD 1983 UTM

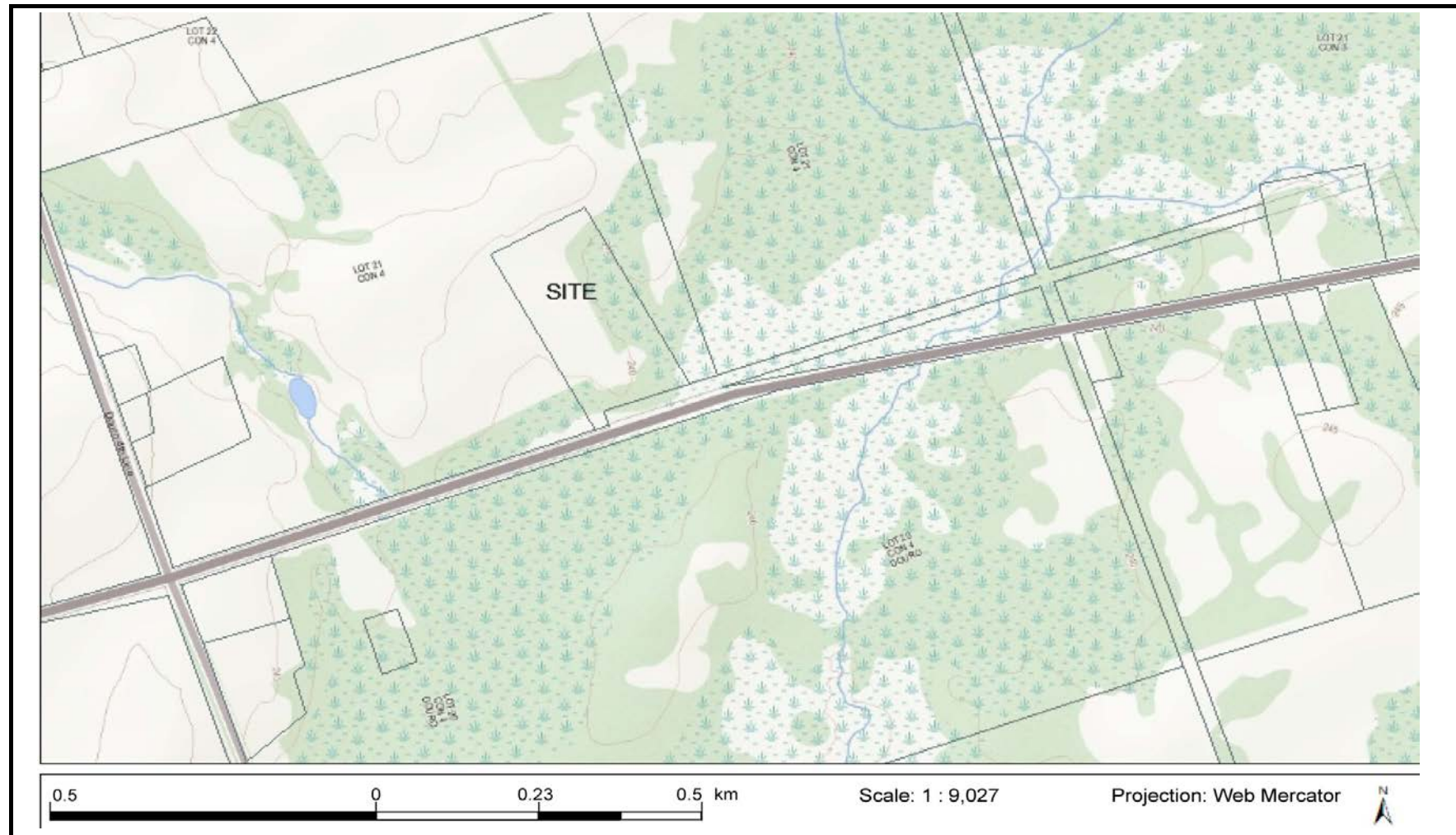


Stoney Lake Rd Transfer Station
Part Lot 21, Concession 4
Township of Douro-Dummer

11193449-01
March 2020

Geologic Plan

FIGURE 1



Source: Ministry of Natural Resources and Forestry. © Queen's Printer for Ontario, 2015. Note: Property boundary is not a legal survey.

Scale:
See Scale Bar
Coordinate System:
NAD 1983 UTM Zone 17

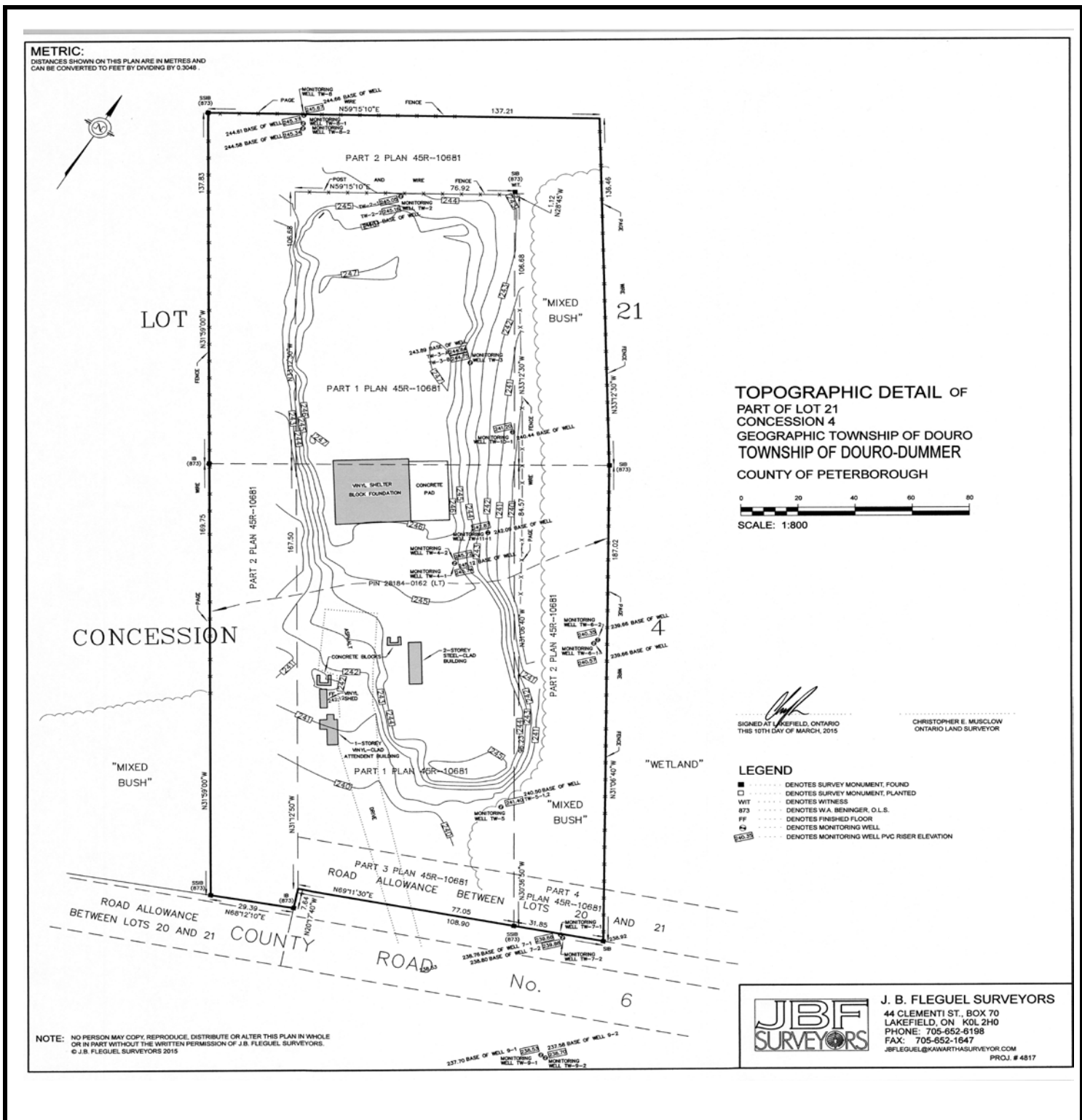


Part Lot 21, Concession 4 Douro
Township of Douro-Dummer, Ontario
Stoney Lake Road Transfer Station

Site Plan

11193449-01
March 2020

FIGURE 2



Base map compiled from J.B. Fluegel Surveyors, 2015

Scale:
Refer to Scale Bar
Coordinate System
NAD 1983 UTM

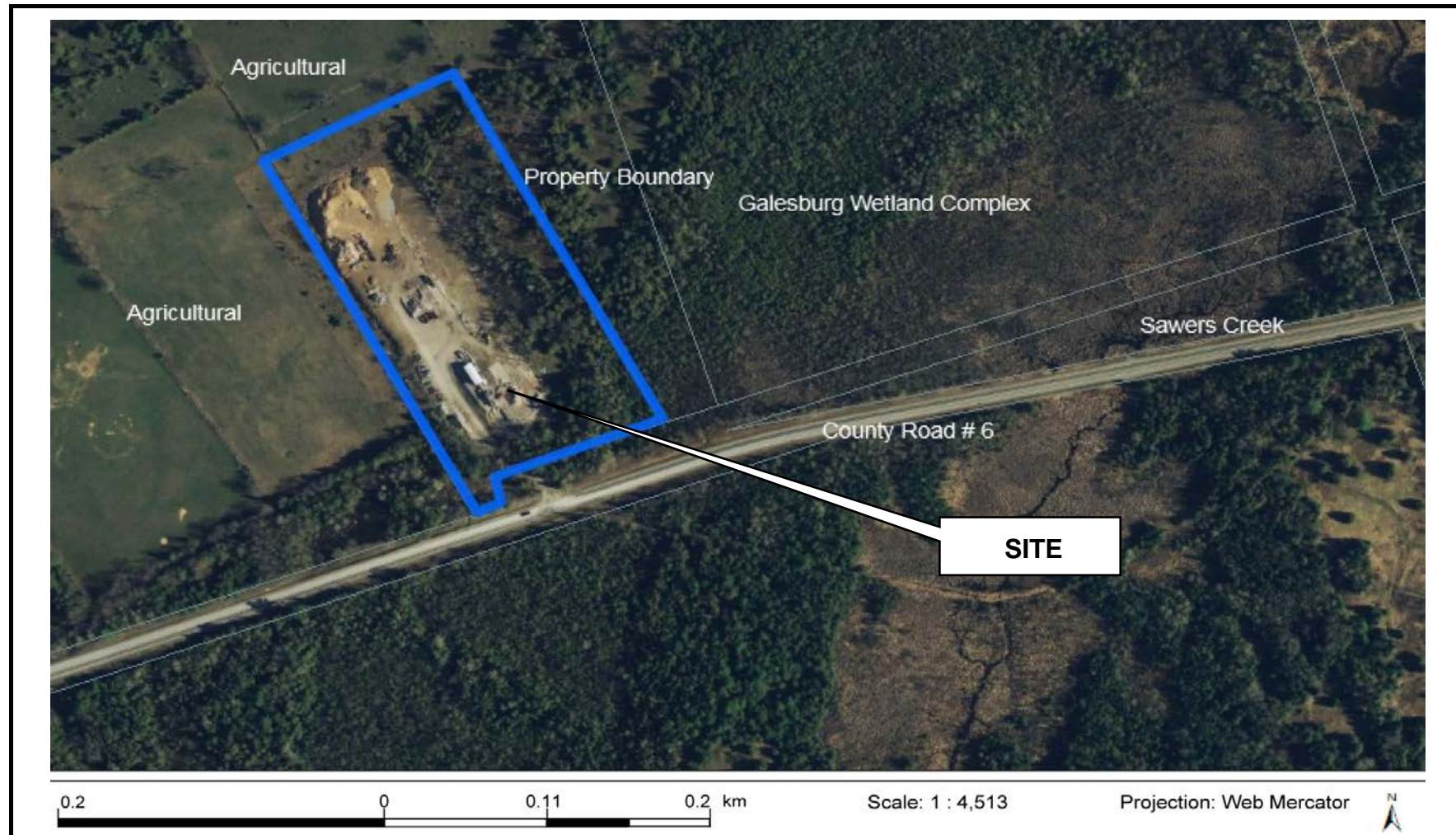


Stoney Lake Rd Transfer Station
348 County Road #6
Part Lot 21, Concession 4
Township of Douro-Dummer

11193449-01
March 2020

Site Plan

FIGURE 3A



Source: Ministry of Natural Resources and Forestry. © Queen's Printer for Ontario, 2015. Note: Property boundary is not a legal survey.

Scale:
See Scale Bar
Coordinate System:
NAD 1983 UTM Zone 17



Part Lot 21, Concession 4 Douro
Township of Douro-Dummer, Ontario
Stoney Lake Road Transfer Station

11193449-01
March 2020

Property Boundary

FIGURE 3B



Base Plan compiled from MNR mapping

Scale:
NTS
Coordinate System:
NAD 1983 UTM Zone 17

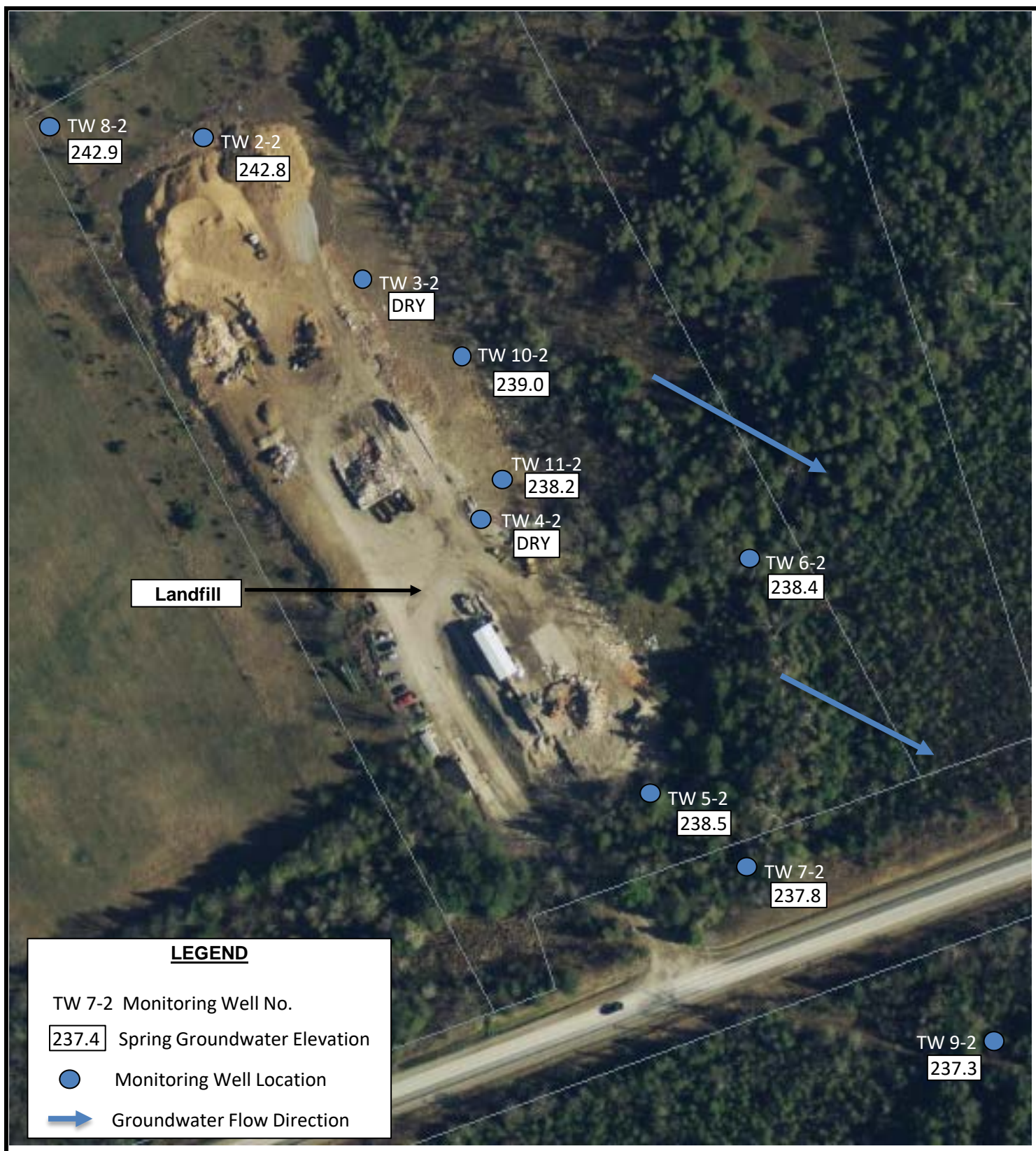


Stoney Lake Rd Transfer Station
Part Lot 21, Concession 4
Township of Douro-Dummer

11193449-01
March 2020

Monitoring Location

FIGURE 3C



Base map compiled from J.B. Fluegel Surveyors, 2015

Scale:
 Not To Scale
 Coordinate System
 NAD 1983 UTM



Stoney Lake Rd Transfer Station
 Part Lot 21, Concession 4
 Township of Douro-Dummer

11193449-01
 March 2020

Groundwater Flow

FIGURE 3D



Base map compiled from J.B. Fluegel Surveyors, 2015

Scale:
 NTS
 Coordinate System
 NAD 1983 UTM



Stoney Lake Rd Transfer Station
 Part Lot 21, Concession 4
 Township of Douro-Dummer

11193449-01
 March 2020

Groundwater Flow

FIGURE 3E

2019 FIELD MONITORING SUMMARY
 Stoney Lake Road Transfer Station
 Township of Douro-Dummer, County of Peterborough
 Project No. 11193449-01

May 29, 2019							
MONITORING WELL	TEMPERATURE (°C)	ELECTRICAL CONDUCTIVITY (uS/cm)	H2S	METHANE (% CH4)	pH	ORP	DO mg/L
TW-2-1	9.5	343	0	0	7.60	75.0	7.6
TW-2-2	9.1	365	0	0	7.85	76.0	5.4
TW-3-1	10.8	686	0	0	7.15	60.0	5.0
TW-3-2			0	0			
TW-4-1	9.7	400	0	0	7.40	189.0	7.5
TW-4-2			0	10			
TW-5-1	9.1	2130	0	0	6.81	20.0	5.7
TW-5-2	9.3	1708	0	0	7.31	118.0	7.5
TW-6-1	9.6	650	0	0	7.38	126.0	4.5
TW-6-2	8.6	517	0	0	7.71	118.0	4.2
TW-7-1	8.9	430	0	0	7.45	-14.0	10.3
TW-7-2	8.5	1694	0	0	7.03	-15.0	6.6
TW-8-1 (2014)			0	0			
TW-8-2 (2014)	10.1	404	0	0	7.56		5.7
TW-9-1	9.1	311	0	0	7.59	85.0	9.2
TW-9-2	10.8	362	0	0	7.82	115.0	4.1
TW-10-2	10.0	1000	0	0	6.70	25.0	6.6
TW-11-2	7.7	396	0	0	7.70	193.0	8.1
SW-1	13.0	324	0		7.74	111.0	6.3
SW-3	13.1	586	0		7.95	115.0	9.2
SW-6	12.1	656	0		7.63	115.0	9.2
SW-8	16.1	480	0		7.78	140.0	9.4

Notes:
 (---) indicates no data

2019 FIELD MONITORING SUMMARY
 Stoney Lake Road Transfer Station
 Township of Douro-Dummer, County of Peterborough
 Project No. 11156055-01

October 28, 2019							
MONITORING WELL	TEMPERATURE (°C)	ELECTRICAL CONDUCTIVITY (uS/cm)	H2S	METHANE (% CH4)	pH	ORP	DO mg/L
TW-2-1	11.3	502	0	0	7.35	117.0	8.2
TW-2-2	12.0	1103	0	0	6.87	139.0	5.3
TW-3-1	too little to sample		0	3			
TW-3-2	Dry		0	3.8			
TW-4-1	12.1	1107	0	0	7.07	155.0	6.5
TW-4-2	Dry		0	0			
TW-5-1	10.9	221	0	0	6.65	122.0	6.9
TW-5-2	11.3	1058	0	0	6.55	165.0	7.2
TW-6-1	11.4	959	0	0	7.03	164.0	7.0
TW-6-2	11.3	1006	0	0	7.01	167.0	7.0
TW-7-1	11.7	395	0	0	6.72	118.0	6.3
TW-7-2	11.9	1751	0	0	6.35	162.0	5.2
TW-8-1 (2014)	12.1	413	0	0	7.23	118.0	7.2
TW-8-2 (2014)	Dry		0	0			
TW-9-1	12.5	410	0	0	6.42	179.0	6.3
TW-9-2	11.9	339	0	0	6.59	167.0	6.7
TW-10-2	Dry		0	0			
TW-11-2	10.9	1266	0	9	6.64	-5.8	5.8
SW-1	11.8	411	0		7.71	121.0	6.0
SW-3	dry						
SW-6	dry						
SW-8	7.9	305	0		7.90	126.0	8.9

Notes:
 (---) indicates no data

2019
Stoney Lake Road Transfer Station
Township of Douro-Dummer, County of Peterborough
Project No. 11193449-01

		May 29, 2019		Oct. 28, 2019	
MONITORING WELL	TOP OF CASING ELEVATION	WATER LEVEL FROM TOP OF CASING	WATER LEVEL ELEVATION	WATER LEVEL FROM TOP OF CASING	WATER LEVEL ELEVATION
	(M)	(M)	(M)	(M)	(M)
TW-2-1	245.05	5.41	239.64	7.03	238.02
TW-2-2	245.16	2.36	242.80	4.92	240.24
TW-3-1	244.84	5.08	239.76	7.81	237.03
TW-4-1	245.74	6.80	238.94	8.00	237.74
TW-5-1	241.40	2.98	238.42	3.69	237.71
TW-5-2	241.40	2.87	238.53	3.74	237.66
TW-6-1	240.57	2.13	238.44	2.98	237.59
TW-6-2	240.35	1.96	238.39	2.76	237.59
TW-7-1	239.66	1.31	238.35	1.97	237.69
TW-7-2	239.86	2.10	237.76	2.27	237.59
TW-8-1 (2014)	245.37	---		7.74	237.63
TW-8-2	245.34	2.44	242.90	dry	---
TW-9-1	238.53	0.15	238.38	0.78	237.75
TW-9-2	238.20	0.81	237.39	1.01	237.19
TW-10-2	241.20	2.16	239.04	3.40	237.80
TW-11-2	242.09	3.90	238.19	5.05	237.04

Notes:

All measurements presented in metres.

(na) - indicates not available

EVALUATION OF REASONABLE USE CRITERIA, May 2019
Stoney Lake Road Transfer Station

Overburden Wells

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	MONITORS					BACKGROUND WELL
				TW 6-2	TW 7-2	TW 9-2	TW 10-2	TW 11-2	TW8-2
Alkalinity	500	229	364.50	276.00	224.00	2210.00	355.00	437.00	229
Barium	1	0.0293	0.51	0.11	0.13	0.49	0.40	0.03	0.0293
Boron	5	0.01	2.51	0.08	1.25	0.03	0.43	0.05	0.013
Chloride	250	2.00	126.00	5.00	280.00	4.00	28.00	3.00	2
Iron	0.3	0.02	0.16	0.01	8.41	2.82	41.30	0.07	0.02
Manganese	0.05	0.00	0.03	0.46	2.47	0.27	2.49	0.00	0.00091
TDS	500	234.00	367.00	489.00	1590.00	274.00	606.00	311.00	234
Nitrate	10	0.61	5.31	1.98	< 0.06	0.20	< 0.06	2.14	0.61
Sodium	200	2.86	101.43	7.51	127.00	3.00	28.20	2.61	2.86
Sulphate	500	8.00	254.00	23.00	520.00	15.00	8.00	9.00	8

Background Monitor was Dry. Values from last available data for TW-8-2

Bedrock Wells

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	MONITORS					BACKGROUND WELL
				TW 6-1	TW 7-1	TW 9-1			TW 8-1
Alkalinity	500	234	367.00	399	244	251			234.00
Barium	1	0.044	0.52	0.117	0.174	0.11			0.04
Boron	5	0.035	2.52	0.023	0.024	0.022			0.04
Chloride	250	2	126.00	5	12	18			2.00
Iron	0.3	0.141	0.22	0.012	0.015	0.009			0.14
Manganese	0.05	0.0121	0.03	0.568	0.00239	0.00194			0.01
TDS	500	269	384.50	509	283	300			269.00
Nitrate	10	0.61	5.31	2.58	< 0.06	< 0.06			0.61
Sodium	200	1.9	100.95	4.2	8.4	8.59			1.90
Sulphate	500	4	252.00	12	18	27			4.00

All results are represented in mg/L unless otherwise stated

ODWS - Ontario Drinking Water Standards, 2000

RUP - Reasonable Use Policy (Policy B-4)

Values exceed RUP.

EVALUATION OF REASONABLE USE CRITERIA, October 2019
Stoney Lake Road Transfer Station

Overburden Wells

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	MONITORS					BACKGROUND WELL
				TW 6-2	TW 7-2	TW 9-2	TW 10-2	TW 11-2	TW8-2 (May 2019)
Alkalinity	500	229	364.50	415.00	345.00	215.00		646.00	229
Barium	1	0.0293	0.51	0.29	0.10	0.21		0.40	0.0293
Boron	5	0.01	2.51	0.36	1.49	0.01		0.37	0.013
Chloride	250	2.00	126.00	110.00	130.00	4.00		56.00	2
Iron	0.3	0.02	0.16	0.01	0.27	0.02		8.11	0.02
Manganese	0.05	0.00	0.03	1.32	2.25	0.01		1.52	0.00091
TDS	500	234.00	367.00	909.00	1320.00	291.00		891.00	234
Nitrate	10	0.61	5.31	0.15	< 0.06	0.09		< 0.06	0.61
Sodium	200	2.86	101.43	1.32	2.25	0.01		1.52	2.86
Sulphate	500	8.00	254.00	140.00	460.00	10.00		170.00	8

Background Monitor was Dry. Values from last available data for TW-8-2

Bedrock Wells

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	MONITORS					BACKGROUND WELL
				TW 6-1	TW 7-1	TW 9-1			TW 8-1
Alkalinity	500	247	373.50	534	231	237.00			247
Barium	1	0.0611	0.53	0.393	0.0157	0.11			0.0611
Boron	5	0.015	2.51	0.145	0.002	0.03			0.015
Chloride	250	7	128.50	55	13	18.00			7
Iron	0.3	1.05	0.68	0.221	< 0.007	0.01			1.05
Manganese	0.05	0.0863	0.07	4.36	0.00057	0.00			0.0863
TDS	500	297	398.50	806	303	303.00			297
Nitrate	10	1.21	5.61	0.08	< 0.06	< 0.06			1.21
Sodium	200	3.34	101.67	38	1.3	9.64			3.34
Sulphate	500	7	253.50	110	17	28.00			7

All results are represented in mg/L unless otherwise stated

ODWS - Ontario Drinking Water Standards, 2000

RUP - Reasonable Use Policy (Policy B-4)

Values exceed RUP.

Appendix A

MECP PCoA and Correspondence

Ministry of the Environment
Environmental Assessment and
Approvals Branch
Floor 12A
2 St Clair Ave W
Toronto ON M4V 1L5
Fax: (416) 314-8452
Telephone: (416) 314-1081

Ministère de l'Environnement
Direction des évaluations et des
autorisations environnementales
Étage 12A
2 av St Clair O
Toronto ON M4V 1L5
Télécopieur : (416) 314-8452
Téléphone : (416) 314-1081



August 22, 2008

David Clifford, CAO
The Corporation of the Township of Douro-Dummer
894 South St
Post Office Box, No. 92
Warsaw, Ontario
K0L 3A0

Dear Sir/Madam:

**Re: Application for Approval of Waste Disposal Sites
Amendment to CofA # A340901
Douro-Dummer Township, County of Peterborough
MOE Reference Number 2649-7HMJDA**

We acknowledge receipt of your application for approval dated August 15, 2008 and received on August 15, 2008 for the following:

Approval Type:	Waste Disposal Sites
Project Description:	This application is for an amendment to the existing CofA No. A340901 to increase the total amount of residual waste leaving the transfer station to 100 tonnes per day
Site Location:	Stoney Lake Road Landfill Lot 21, Concession 4, Douro Ward Douro-Dummer Township, County of Peterborough

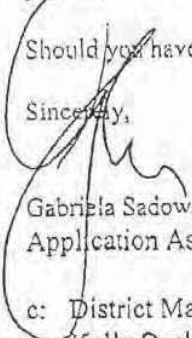
The Ministry's reference number for your application is 2649-7HMJDA. Please quote this number in any correspondence or enquiries regarding this application.

Please note that your submission has only been screened with respect to the presence of the supporting documentation normally required for this type of application, and did not include any technical analysis of the documentation, and therefore you may still be requested to provide some additional information during our detailed technical review of the application. In such a case, the Reviewer will contact you and/or your identified Project Technical Information Contact at this time.

Also, please note that a duplicate copy of the application and all supporting information should have been sent to the local District Office of the Ministry. If this has not been done, please do so as soon as possible.

Should you have any questions related to your application, please contact me at the above phone number.

Sincerely,



Gabriela Sadowska

Application Assessment Officer

c: District Manager, MOE Peterborough

Kelly Dechert, P. Eng., Totten Sims Hubicki Associates (1997) Limited, fax No.
(905)668-0221



Ontario

Ministry of the Environment
Ministère de l'Environnement

*AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE*

NUMBER A340901

Notice No. 2

Issue Date: February 13, 2008

The Corporation of the Township of Douro-Dummer
894 South Street
Post Office Box, No. 92
Warsaw, Ontario
K0L 3A0

Site Location: Stoney Lake Road Landfill
Lot 21, Concession 4, Douro Ward
Douro-Dummer Township, County of Peterborough

You are hereby notified that I have amended Provisional Certificate of Approval No. A340901 issued on September 11, 2003 for a waste disposal site (landfill/transfer), as follows:

I. The following Definitions are hereby added:

- (q) *"trained personnel"* means any operator at the Transfer Station who is knowledgeable and able to carry out any necessary duties, in the following through instruction and practice;
 - (i) relevant waste management legislation, regulations and guidelines;
 - (ii) occupational health and safety concerns pertaining to the waste to be handled;
 - (iii) any environmental concerns pertaining to the Transfer Station and wastes to be transferred;
 - (iv) emergency management procedures for the waste to be handled;
 - (v) use and operation of any equipment to be used;
 - (vi) operation and management of the Transfer Station, or areas within the Transfer Station, as per the specific job requirements of each individual operator, and which include procedures for receiving, screening, refusal, and handling of waste;
 - (vii) use of the Emergency Response Plan, and in the procedures to be employed in the event of an emergency;
 - (viii) Transfer Station specific operations and/or procedures; and
 - (ix) the requirements of this Certificate.
- (r) *"dry waste"* means municipal waste, limited to clean wood, concrete and masonry, bricks, cardboard, plaster and drywall, scrap metal, glass, plastic, shingles, ceramics and furniture from home and light commercial activity.
- (s) *"municipal waste"* means the definition that is specified in Regulation 347 of the Environmental Protection Act.

- (i) "*clean wood*" means waste that is wood or a wood product that is not contaminated with chromated-copper arsenate, ammoniacal copper arsenic pentachlorophenol, creosote or other wood preservative.
- (ii) "*residual waste*" means waste that is destined for final disposal and includes wood waste and tires.

II. The following Items are hereby added to Schedule "A"

- 9. Application for a Provisional Certificate of Approval for a Waste Disposal Site dated November 20, 2007, and signed by David Clifford, C.A.O., including the attached report entitled "Stoney Lake Road Transfer Station and Waste Processing Site. Design, Operations and Maintenance Report. November 2007."
- 10. e-mails from Kelly Dechert, Manager, Environmental Management Group Totten Sims Hubicki Associates to Senior Review Engineer Jim Chisholm dated December 12, 2007, January 4, 2008, January 10, 2008 (4:04pm) with attachment, January 18, 2008, and Feb. 4, 2008 (4:34pm).
- 11. e-mails from Senior Review Engineer Jim Chisholm to Kelly Dechert dated January 3, 2008, January 4, 2008 (2:33pm), January 10, 2008, January 11, 2008, January 18, 2008 (2:58pm), January 30, 2008 and Feb. 4, 2008 (4:17pm).
- 12. Letters signed by Kelly Dechert addressed to Senior Review Engineer Jim Chisholm dated December 12, 2007, January 3, 2008, January 15, 2008 and January 28, 2008.
- 13. Letter dated January 8, 2008 from Senior Review Engineer Jim Chisholm to David Clifford, C.A.O., the Corporation of the Township of Douro-Dummer.

III. Definition (p) is hereby revoked and replaced by the following Definition (p):

- p. "*Transfer Station*" means the operation and infrastructure comprising the processing of *dry waste* and the transfer station described in Items 7, 9, 10, 11, 12 and 13 of Schedule "A".

IV. Conditions numbers 25, 29, 30, 31, 38, 39 and 45 are hereby revoked and replaced by the following:

- 25. The *Transfer Station* shall be designed, developed, built, operated, maintained, and the management, processing and disposal of all *dry waste* shall be carried out, in accordance with the *EPA, Regulation 347*, and except as otherwise provided by this *Certificate*, the applications for this *Certificate*, dated February 14, 2007 and November 20, 2007, and the supporting documentation listed in Schedule "A". At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

29. Only *dry waste* shall be accepted at the *Transfer Station*.
30. No more than 800 tonnes of *dry waste* per day shall be accepted at the *Transfer Station*.
31. No more than 800 tonnes of *dry waste, residual waste* and processed materials, shall be stored or be present at the *Transfer Station* at any time. If for any reason waste and processed materials cannot be transferred from the *Transfer Station*, the *Transfer Station* shall cease accepting waste.
38. The Design and Operations Report shall consist of the report identified in item 9 of Schedule "A", and shall be retained, kept up to date through periodic revisions, and made available for inspection by *Ministry* staff. Changes to the Design and Operations Report shall be submitted to the *Director* for approval.
39. a) A training plan shall be developed and maintained for all *operators* of the *Transfer Station*. The scope of the training plan shall include information that adequately covers all of the items outlined in definition (q) of this Notice. Only *trained personnel* may be *operators* at the *Transfer Station*.
- b) The *Owner* shall maintain a written or electronic record at the *Transfer Station* of training that was provided including:
- (i) date of training;
 - (ii) name and signature of person who has been trained; and
 - (iii) description of the training provided and who it was delivered by.
- c) Training records shall be made available to a *Provincial Officer* upon request.
45. The Emergency Response Plan in the Design and Operations Report shall be implemented as required. The *Owner* shall provide copies of the Emergency Response Plan to the local Municipality and to the Fire Department within thirty (30) days of the date of issuance of this Notice.

V. The following sub clause to Condition 44 is hereby added:

- d. if at any time noise and vibration nuisances are generated at the *Transfer Station*, resulting in complaints received by this *Ministry* and validated by a *Provincial Officer*, the *Owner* shall take remedial action immediately.

VI. The following conditions are hereby added:

Mobile Grinding

54. Mobile grinding at the *Transfer Station* is restricted to grinding shingles and *cleun wood*.
55. Any mobile grinding services at the *Transfer Station* shall be provided by a mobile grinding

services provider who has a Certificate of Approval (Air and Noise) for the operation of the mobile grinder.

Residual Waste

56. a) The total amount of *residual waste* arising out of the processing operations and leaving the *Transfer Station* for final disposal shall not exceed 40 tonnes per day.
- b) *Residual waste* at the *Transfer Station* shall be stored in container bins.
- c) *Residual waste* shall be moved off-site from the *Transfer Station* within fourteen (14) days of its receipt.
- d) If *residual waste* contains putrescible waste, it shall be moved off-site from the *Transfer Station* within 72 hours of its receipt. If any adverse effects occur as a result of the presence of putrescible waste, the waste must be removed from the *Transfer Station* immediately.

The reasons for these amendments to the Certificate of Approval are as follows:

1. The reason for Definitions p, q, r, s, t and u is to define terms used throughout this *Certificate*.
2. The reason for Conditions 25, 29, 38, 39, 44 d), 45, 54, 55, and 56 is to ensure that the *Transfer Station* is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.
3. The reason for Conditions 30 and 31 is to specify the types of waste that may be accepted at the *Transfer Station*, the amount of wastes that may be processed at the *Transfer Station*, the amount of waste and processed material that may be stored at the *Transfer Station* and the maximum rate at which the *Transfer Station* may receive waste based on the Company's application and supporting documentation.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A340901 dated September 11, 2003

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

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

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;

7. The name of the Director;
8. The municipality within which the waste disposal site is located;

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

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

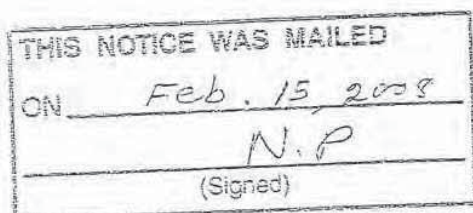
AND

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

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

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

DATED AT TORONTO this 13th day of February, 2008



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

IC/

c: District Manager, MOE Peterborough
Kelly Dechert, P. Eng., Totten Sims Hubicki Associates (1997) Limited ✓



Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE

NUMBER A340901

Notice No. 1

Issue Date: May 24, 2007

The Corporation of the Township of Douro-Dummer -
894 South St
Post Office Box, No. 92
Warsaw, Ontario
K0L 3A0

Site Location: Stoney Lake Road Landfill
Lot 21, Concession 4, Douro Ward
Douro-Dummer Township, County of Peterborough

You are hereby notified that I have amended Provisional Certificate of Approval No. A340901 issued on September 11, 2003 for a waste disposal site (landfill/transfer), as follows:

I. Definition (i) is hereby revoked and replaced by the following Definitions (i).1 and (i).2:

- (i).1 "Operator " means any person, other than the *Owner's* employees, authorized by the *Owner* as having the charge, management or control of any aspect of the site, and includes its successors or assigns;
- (i).2 "Owner " means any person that is responsible for the establishment or operation of the site being approved by this *Certificate*, and includes The Corporation of the Township of Douro-Dummer, its successors and assigns;

II. The following Definitions are hereby added:

- (m) "PA " means the *Pesticides Act*, R.S.O. 1990, c. P-11, as amend from time to time;
- (n) "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* .
- (o) "Reg. 347 " means Regulation 347, R.R.O. 1990, made under the *EPA* , as amended from time to time;
- (p) "Transfer Station " means the operation and infrastructure comprising the transfer station described in Item 7 of Schedule "A".

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

7. Application for a Provisional Certificate of Approval for a Waste Disposal Site dated February 14, 2007, and signed by David Clifford, C.A.O., including the attached report entitled "Stoney Lake Road Landfill Site Transfer Station: Design, Operations and Maintenance Report" and all supporting documentation.
8. Fax dated May 8, 2007 from Mike Mundell, M & M Disposal Service, to Andrew Neill, MOE, with an alternate disposal location.

IV. The following sub-conditions are hereby added:

23. (f) a detailed monthly summary of the type and quantity of all-incoming and outgoing wastes at the *Transfer Station* and the destination of all outgoing wastes;
- (g) any environmental and operational problems, that could negatively impact the environment, encountered during the operation of the *Transfer Station* and during the facility inspections and any mitigative actions taken;
- (h) any changes to the Emergency Response Plan, the Design and Operations Report and the Closure Plan that have been approved by the Director since the last *Annual Report*;
- (i) any recommendations to minimize environmental impacts from the operation of the *Transfer Station* and to improve *Transfer Station* operations and monitoring programs in this regard.

V. The following Conditions are hereby added:

Transfer Station

The following conditions apply to the operation of the *Transfer Station* only.

Operations

25. The *Transfer Station* shall be designed, developed, built, operated, maintained, and the management and disposal of all waste shall be carried out, in accordance with the *EPA*, *Regulation 347*, and except as otherwise provided by this *Certificate*, with the application for this *Certificate*, dated **February 14, 2007**, and the supporting documentation listed in Schedule "A". At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

Hours of Operation

26. Waste may be accepted at the *Transfer Station* between the hours of 8:00am and 5:00pm, Monday through Friday, except statutory holidays.

27. With the prior written approval of the *District Manager* , the time periods may be extended to accommodate seasonal or unusual quantities of waste.

Service Area

28. Only waste that is generated within 50 kilometres of the *Site* shall be accepted at the *Transfer Station*.

Waste Types

29. Only solid non-hazardous waste limited to construction and demolition debris shall be accepted at the *Transfer Station* .

Waste Limits

30. No more than 100 tonnes of waste per day shall be accepted at the *Transfer Station* .
31. No more than 100 tonnes of waste shall be stored or be present at the *Transfer Station* at any time. If for any reason waste cannot be transferred from the *Transfer Station*, the *Transfer Station* shall cease accepting waste.

Signage

32. A sign shall be posted and maintained at the *Transfer Station* in a manner that is clear and legible, and shall include the following information:
- a. the name of the *Transfer Station* and *Owner* ;
 - b. this *Certificate* number;
 - c. the name of the *Operator* ;
 - d. the normal hours of operation;
 - e. the allowable and prohibited waste types;
 - f. a telephone number to which complaints may be directed;
 - g. a twenty-four (24) hour emergency telephone number (if different from above); and
 - h. a warning against dumping outside the *Transfer Station* .

Waste Inspection

33. All waste shall be inspected by *Trained personnel* prior to being accepted at the *Transfer Station* to ensure that the waste is of a type approved for acceptance under this *Certificate* .
34. In the event that any waste load is refused, a record shall be made in the daily log book of the reason the waste was refused and the origin of the waste, if known.

Incoming / Outgoing Waste

35. All incoming and outgoing wastes shall be inspected by *Trained personnel* prior to being

received, transferred and/or shipped to ensure wastes are being managed and disposed of in accordance with the *EPA* and *Reg. 347*.

Labelling

36. All waste storage containers at the *Transfer Station* shall have a label or sign clearly identifying the contents.

Vermin, etc.

37. The *Transfer Station* shall be operated and maintained such that vermin, vectors, dust, litter, odour and noise do not create a nuisance.

Design and Operations Report

38. The Design and Operations Report shall consist of the Item 7 in Schedule "A", and shall be retained, kept up to date through periodic revisions, and made available for inspection by *Ministry* staff. Changes to the Design and Operations Report shall be submitted to the *Director* for approval.

Training Plan

39. A training plan shall be developed and maintained for all employees that operate the *Transfer Station*. Only *Trained personnel* may operate the *Transfer Station* or carry out any activity required under this *Certificate*.
40. The *Owner* shall ensure that *Trained personnel* are available at all times during the hours of operation of this *Transfer Station*. *Trained personnel* shall supervise all transfer or processing of waste material at the *Transfer Station*.

Site Security

41. The *Transfer Station* shall be operated and maintained in a secure manner, such that unauthorized persons cannot enter the *Transfer Station*.

Site Inspection

42. An inspection of the entire *Transfer Station* and all equipment on the *Transfer Station* shall be conducted each week the *Transfer Station* is in operation to ensure that: the *Transfer Station* is secure; that the operation of the *Transfer Station* is not causing any nuisances; that the operation of the *Transfer Station* is not causing any adverse effects on the environment; and that the *Transfer Station* is being operated in compliance with this *Certificate*. Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the *Transfer Station* if needed.

43. A record of the inspections, including the following information, shall be kept in the weekly log book:
- a. the name and signature of person that conducted the inspection;
 - b. the date and time of the inspection;
 - c. a list of any deficiencies discovered;
 - d. any recommendations for remedial action; and
 - e. the date, time and description of actions taken.

Complaint Response

44. If at any time, the *Owner* receives complaints regarding the operation of the *Transfer Station*, 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 separate log book, along with the following information:
 - i. the nature of the complaint,
 - ii. if the complaint is odour or nuisance related, the weather conditions and wind direction at the time of the complaint;
 - iii. the name, address and telephone number of the complainant (if provided); and
 - iv. the time and date of the complaint;
 - 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, notify the *District Manager* of the complaint within 48 hours of receiving 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.

Emergency Response Plan

45. The Emergency Response Plan in Item 7 of Schedule "A" shall be implemented as required. The *Owner* shall provide copies of the Emergency Response Plan to the local Municipality and the Fire Department within thirty (30) days of the date of issuance of this Notice.
46. The Emergency Response Plan shall be kept up to date, and a copy shall be retained and accessible to all staff at all times. Changes to the Emergency Response Plan shall be submitted to the *Director* for approval.
47. The equipment, materials and personnel requirements outlined in the Emergency Response Plan shall be immediately available on the *Transfer Station* at all times. The equipment shall be kept

in a good state of repair and in a fully operational condition.

48. All staff that operate the *Transfer Station* shall be fully trained in the use of the contingency and Emergency Response Plan, and in the procedures to be employed in the event of an emergency.
49. The *Owner* shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation of this *Transfer Station* and immediately implement the emergency response plan if required.

Closure Plan

50. A Closure Plan shall be submitted to the *Director* for approval, with a copy to the *District Manager*, no later than six (6) months before the planned closure date of the *Transfer Station*. The Closure Plan shall include, at a minimum, a description of the work that will be done to facilitate closure of the *Transfer Station* and a schedule for completion of that work.
51. The *Transfer Station* shall be closed in accordance with the approved Closure Plan.
52. Within 10 days after closure of the *Transfer Station*, the *Owner* shall notify the *Director*, in writing, that the *Transfer Station* is closed and that the approved Closure Plan has been implemented.

Log Book

53. A log shall be maintained, either electronically or in written format, and shall include the following information as a minimum:
 - a. the date;
 - b. quantity and source of waste received;
 - c. quantity of waste at the *Transfer Station* at the end of the operating week;
 - d. quantities and destination of each type of waste shipped from the *Transfer Station*;
 - e. a record of inspections required by this *Certificate*;
 - f. a record of any spills or process upsets at the site, the nature of the spill or process upset and the action taken for the clean up or correction of the spill, the time and date of the spill or process upset, and for spills, the time that the *Ministry* and other persons were notified of the spill in fulfilment of the reporting requirements in the *EPA*;
 - g. a record of any waste refusals which shall include; amounts, reasons for refusal and actions taken; and
 - h. the signature of the *Trained Personnel* conducting the inspection and completing the report.

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

1. The reason for Definitions (i).1, (i).2, (m), (n), (o) and (p) is to define terms used throughout this *Certificate*.

2. The reasons for sub-conditions 23(f), (g), (h) and (i) 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.
3. The reason for Conditions 25 and 37 is to ensure that the Transfer Station is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.
4. The reasons for Conditions 26 and 27 are to specify the hours of operation for the Transfer Station and a mechanism for amendment of the hours of operation, as required.
5. The reasons for Conditions 28, 29, 30 and 31 are to specify the approved service area from which waste may be accepted at the Transfer Station, the types of waste that may be accepted at the Transfer Station, the amounts of waste that may be stored and processed at the Transfer Station, and the maximum rate at which the Transfer Station may receive waste based on the Company's application and supporting documentation.
6. The reason for Conditions 32 is to ensure that users of the Transfer Station are fully aware of important information and restrictions related to Transfer Station operations and access under this Certificate of Approval.
7. The reasons for Conditions 33 and 34 are to ensure that all incoming wastes are inspected to ensure compliance with this *Certificate*, and to ensure that a record is made of any waste load refusal.
8. The reason for Conditions 35 and 36 is to ensure that all wastes are properly classified to ensure that they are managed, processed and disposed in accordance with O. Reg. 347, R.R.O. 1990 and in a manner that protects the health and safety of people and the public.
9. The reason for Condition 38 is to ensure that an up-to-date Design and Operations Report is maintained on-site at all times.
10. The reason for Condition 39 and 40 is to ensure that the Transfer Station is operated by properly Trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.
11. The reason for Condition 41 is to ensure the controlled access and integrity of the Transfer Station by preventing unauthorized access when the Transfer Station is closed and no site attendant is on duty.
12. The reasons for Conditions 42 and 43 are to ensure that routine Transfer Station inspections are completed, and that detailed records of Transfer Station inspections are recorded and maintained for inspection and information purposes.

13. The reason for Condition 44 is to ensure that any complaints regarding Transfer Station operations at the Transfer Station are responded to in a timely manner.
14. The reasons for Conditions 45, 46, 47, 48 and 49 are to ensure that an Emergency Response Plan is developed and maintained at the Transfer Station and that staff are properly trained in the operation of the equipment used at the Transfer Station and emergency response procedures.
15. The reasons for Condition 50, 51 and 52 are to ensure that the Transfer Station is closed in accordance with Ministry standards and to protect the health and safety of the public and the environment.
16. The reasons for Condition 53 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 Certificate of Approval, the EPA and its regulations.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A340901 dated September 11, 2003

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

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

The Notice should also include:

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

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

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

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

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the

Ministry of the
Environment

Peterborough District Office
300 Water Street
Peterborough ON K9J 8M5
Telephone: (705) 755-4300
Fax: (705) 755-4321

Ministère de
l'Environnement

Bureau de district de Peterborough
300, rue Water
Peterborough ON K9J 8M5
Téléphone: (705) 755-4300
Télécopieur: (705) 755-4321



June 21, 2006

Mr. David Clifford, CAO Clerk-Treasurer
The Corporation of the Township of Douro-Dummer
894 South Street, Box 92
Warsaw, ON K0L 3A0

Dear Mr. Clifford:

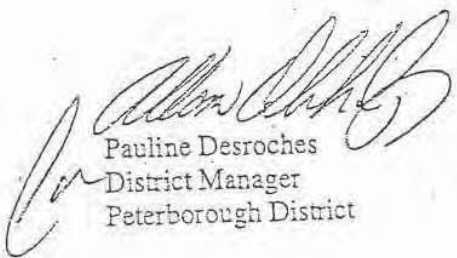
Re: Change to Schedule "B" of the Certificate of Approval No. A340901
Stoney Lake Road Waste Disposal Site
Lot 21, Concession 4, Township of Douro-Dummer, County of Peterborough

In accordance with the request of your consultant SGS Lakefield Research detailed in the annual reports for the Stoney Lake Road Waste Disposal Site, I am amending the required parameters detailed in Schedule "B" of the Certificate of Approval Numbered A340901

The authorization to make this change is detailed in Condition 20 of the above mentioned Certificate of Approval. The amendment deletes the parameters in Schedule "B" consisting of total cyanide, DO and fluorine. This amendment adds the parameter of dissolved organic carbon (DOC) to the Extended Suite Monitoring Wells.

If you have any questions or require additional information concerning the above, please do not hesitate to contact Mr. Dave Beretta, Provincial Officer at 705-755-4338, or the undersigned at 705-755-4315.

Yours truly,


Pauline Desroches
District Manager
Peterborough District

c: SGS Lakefield Research Limited
P.O. Box 4300, Concession Street
Lakefield, ON K0L 2H0

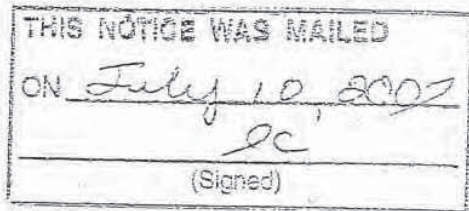
JUN 27 2006

Project Number: 06-1006-002	
Project Manager: CW	
To: CW	
Please....	And....
<input checked="" type="checkbox"/> Read	<input type="checkbox"/> Forward To:
<input type="checkbox"/> Act	<input type="checkbox"/> Return
<input type="checkbox"/> Approve	<input type="checkbox"/> Discard
<input type="checkbox"/>	<input type="checkbox"/> Review with Me
Notes:	

Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca

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

DATED AT TORONTO this 24th day of May, 2007



Tesfaye Gebrezghi, P.Eng.

Director

Section 39, *Environmental Protection Act*

AN/

c: District Manager, MOE Peterborough
Chris Visser, Totten Sims Hubicki Associates (1997) Limited ✓

Senior Environmental Officer
Peterborough District Office

File Storage Number: SI PB DO CO4 610 Lot 21, Concession 4, Douro Ward
Mr. David Bucholtz, SGS Lakefield Research Limited, P.O. Box 4300, 185 Concession Street,
Lakefield, ON K0L 2H0

Ministry of the Environment
Eastern Region
Peterborough District Office
Peterborough Area Office
2nd Floor South Tower
300 Water St S
Peterborough ON K9J 8M5
Fax: (705) 755-4321
Telephone: (705) 755-4300

Ministère de l'Environnement
Direction régionale de l'Est
Bureau du district de Peterborough
Bureau du secteur de Peterborough
2e étage tour sud
300 rue Water S
Peterborough ON K9J 8M5
Télécopieur: (705) 755-4321
Téléphone: (705) 755-4300



January 23, 2006

The Corporation of the Township of Douro-Dummer
Attn: Mr. Dave Clifford, CAO
PO Box 92
Warsaw, Ontario K0L 3A0

RE: Ministry of the Environment
Technical Support Section Comments - Groundwater
Stoney Lake Road Waste Disposal Site
Provisional Certificate of Approval Number A340901
Lot: 21, Concession: 4, Douro Ward
Douro-Dummer, County of Peterborough
Reference Number 6141-6LBKAA

Dear Mr. Clifford:

Staff from the Ministry of the Environment's Eastern Region Technical Support Section have completed a review of the 2004 Annual Monitoring Report for the Stoney Lake Road Waste Disposal Site, produced by SGS Lakefield Research Limited, dated March 2005. Based upon a review of this document, Eastern Region Technical Support Section staff have made several comments and recommendations with respect to hydrogeological issues at the site. Please find attached for your review and action, a copy of the Ministry's technical support section comments, dated January 17, 2006.

It is requested that a written response be provided to this office by no later than February 28, 2006, identifying when and how the Ministry's recommendations will be implemented at the Stoney Lake Road Waste Disposal Site.

Should you have any questions or concerns regarding the information provided, please do not hesitate to contact the undersigned at 705-755-4331.

Yours truly,

Gary Muloin

Leachate Water Quality

TW2-II is located upgradient of the landfill in the shallow aquifer, but it is at the toe of fill area and it has been impacted by leachate. TW3-I is located within the fill area and it is screened in the deep aquifer.

Table 2 Leachate Water Quality

Parameter	TW3-I	TW2-II
Aquifer	Deep	Shallow
Chloride (mg/L)	48	7.8
Alkalinity (mg/L)	754	732
Hardness (mg/L as CaCO ₃)	526	671
Total Dissolved Solids (TDS) (mg/L)	679	834

Except for chloride in the shallow aquifer, the concentrations of leachate parameters are elevated when compared to the background water quality. TW2-2 was also sampled for VOCs and all of the parameters were below detection limits.

Downgradient Water Quality

The downgradient water quality is measure in TW6, which is located between the landfill and the wetland along the eastern property line.

Table 3 Downgradient Water Quality

Parameter	TW6-I	TW6-II
Aquifer	Deep	Shallow
Chloride (mg/L)	47	31
Alkalinity (mg/L)	689	712
Hardness (mg/L as CaCO ₃)	492	552
Total Dissolved Solids (TDS) (mg/L)	720	786

The concentrations of the typical landfill leachate parameters in TW6 are elevated. When downgradient water quality is compared to the leachate water quality in Table 2 there is little difference, which means the leachate is not being well attenuated over the 30 metre bufferlands prior to discharging to the wetland. It will be interesting to see if capping the landfill will result in the improvement of the water quality in TW6. TW6-2 was also sampled for VOCs and all of the samples were below detection limits.

Guideline B-7 and B-9

Guideline B-7 no longer applies to the site because it is closed. The water quality in TW6 is to be monitored closely for the next four (4) years to determine if capping the landfill will improve the quality of water at the downgradient property line. The consultant recommends that additional lands be acquired if the water quality does not improve in four years and I support this recommendation.

MEMORANDUM

17 January 2006

TO: G. Muloin
Environmental Officer
Peterborough District Office
Eastern Region

FROM: S. Ryan
Hydrogeologist
Technical Support Section
Eastern Region

RE: Stoney Lake Road Waste Disposal Site
Lot 21 Concession IV Douro-Dummer Township (Douro)
Certificate of Approval A340901

I have reviewed the *2004 Annual Report Stoney Lake Road Landfill* dated March 2005. The main purpose of the report and the review is to evaluate the site according to Guidelines B-7 and B-9. Based on my review I offer the following comments.

Summary

Based on my review I offer the following conclusions and recommendations.

- 1) Guideline B-7 Reasonable Use does not apply to the site because the landfill is closed.
- 2) Survey the location of any domestic wells in the area and determine whether they should be part of the annual monitoring program.
- 3) The extent of the leachate plume is delineated and within the monitoring well network.
- 4) The primary pathway for the leachate is from the fill area through the overburden and fractured bedrock into the adjacent wetland to the southeast.
- 5) The potential exists for surface water impacts to occur to the adjacent wetland.
- 6) The proposed groundwater monitoring program is acceptable including the recommended changes to the parameter list (removing flourene, cyanide and dissolved oxygen and adding dissolved organic carbon).
- 7) Include information on the cover and capping of the landfill in the 2005 annual report, including the restoration of monitoring wells that were buried in the cover material.
- 8) Given that groundwater discharges to surface water future reports should compare selected groundwater analytical results from key monitoring wells to PWQO.
- 9) Future annual reports should include a more detailed description of the geology and borehole logs.



June 23, 2005

Ontario Ministry of Environment
Peterborough District Office
Robinson Place, South Tower
300 Water Street
Peterborough, Ontario
K9J 8M5

Attn: Mr. Dave Arnott
Senior Environmental Officer

Re: Request for Clarification of Analytical Parameters
Stoney Lake Road Waste Disposal Site, Township of Douro-Dummer
Certificate of Approval No. A340901
SGS Lakefield Reference No. 10058-013

Dear Mr. Arnott:

On behalf of the Township of Douro-Dummer (Township), SGS Lakefield requests the clarification of the parameters for laboratory analysis of groundwater samples as approved in the Certificate of Approval for the Stoney Lake Waste Disposal Site. The specific parameters in question are flourene, total cyanide, and "DO" (assumed to refer to dissolved oxygen) which are listed in the approved monitoring program detailed in Schedule "B" of the Certificate of Approval dated September 11, 2003.

As neither flourene, dissolved oxygen, nor total cyanide are typical leachate indicator parameters for the analysis of groundwater, SGS Lakefield respectfully requests clarification on the requirement of these analytical parameters, and proposes that these parameters be removed from the approved monitoring program. SGS Lakefield further recommends that the parameter dissolved organic carbon be included in the approved monitoring program in place of "DO".

Lakefield Research



If you have any questions or comments regarding this request, please do not hesitate to contact the undersigned at (705) 652-2000 ext. 2058.

Best regards,

SGS LAKEFIELD RESEARCH LIMITED

Environmental Services

A handwritten signature in cursive script that reads 'Christine Wolf'.

Christine M. Wolf, B.A.Sc, EIT
Project Technologist

CMW/njg

c.c. Dave Clifford, CAO, Township of Douro-Dummer

F:\Projects\10051-10100\10056-013 Storey Lk Rd 2005\Correspondence\Ltr to MOE re GW parameters 6-25-05.doc



Ontario

Ministry of the Environment
Ministère de l'Environnement

CERTIFICATE OF APPROVAL
AIR
NUMBER 9365-5YWQFU

The Corporation of the Township of Douro-Dummer
PO Box 92
Warsaw, Ontario
K0L 3A0

Site Location: Stony Lake Road Landfill
Lot 21, Concession 4, Douro Ward
Douro-Dummer Township, County of Peterborough

You have applied in accordance with Section 9 of the Environmental Protection Act for approval of:

- a passive landfill gas venting system serving a municipal landfill, consisting of four (4) vents, each having a diameter of 0.1 metre, extending 3.0 metres above grade;

all in accordance with the application for a Certificate of Approval (Air) and all supporting information dated August 21, 2003, signed by D. Clifford.

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

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

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

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

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal

The Director
Section 9, *Environmental Protection Act*

2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

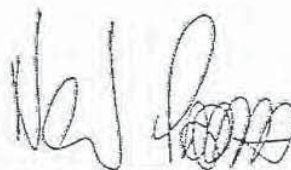
AND

Ministry of Environment and Energy
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

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

The above noted works are approved under Section 9 of the Environmental Protection Act.

DATED AT TORONTO this 13th day of May, 2004



Neil Parrish, P.Eng.
Director
Section 9, *Environmental Protection Act*

QN/

c: District Manager, MOE Peterborough
Linda Elliott, SGS Lakefield Research Limited



Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A340901

The Corporation of the Township of Douro-Dummer
894 South Street, Box 92
Warsaw, Ontario K0L 3A0

Site Location: Stoney Lake Road Waste Disposal Site
Lot 21, Concession 4
Douro-Dummer Township, County of Peterborough

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

a 1.6 hectare landfill within a 4.25 hectare site

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

- (a) "Act" means the *Environmental Protection Act*, R.S.O. 1990, C.E-19, as amended;
- (b) "Buffer" means those lands between the limit of fill and the boundaries of the property owned by the Owner, that shall in no instance be less than 30 metres;
- (c) "Certificate" means this Provisional Certificate of Approval;
- (d) "Director" means Director, Environmental Assessment and Approvals Branch, Ontario Ministry of the Environment;
- (e) "District Manager" means District Manager, Peterborough District Office, Ontario Ministry of the Environment;
- (f) "Limit of Fill" means the area in which waste is approved for final disposal according to this Certificate;
- (g) "Ministry" and "MOE" means the Ontario Ministry of the Environment; and
- (h) "OWRA" means the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended;
- (i) "Owner" or "Operator" means the owner of a Site or the person responsible for managing the farming operations on a Site on behalf of the Owner;

- (j) "FWQO" means the Provincial Water Quality Objectives included in the July 1994 publication entitled *Water Management Policies, Guidelines, Provincial Water Quality Objectives*, as amended from time to time;
- (k) "RUP" means the Reasonable Use Policy (Guideline B-7) of the Ministry of the Environment; and
- (l) "Site" means the 4.25 hectare property located at east half, lot 21, Concession 4, Township of Duoro-Dummer Township, County of Peterborough.

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

TERMS AND CONDITIONS

General

1. This Provisional Certificate of Approval supersedes and replaces Provisional Certificate Number A340901 issued September 17, 1982.
2. Except as otherwise provided by these Conditions, the Site shall be closed and maintained, and all clean-up, grading and seeding activities shall be undertaken in accordance with the Application for a Certificate of Approval for a Waste Disposal Site dated April 7, 2002, and supporting documentation, and plans and specifications listed in Schedule "A".
3. The requirements specified in this Certificate are requirements under the Act. Issuance of this Certificate in no way abrogates the Owner's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.
4. The requirements of this Certificate are severable. If any requirements of this Certificate, or the application of any requirement of this Certificate to any circumstance, is held invalid, the application of such requirement to other circumstances and the remainder of this Certificate shall not be affected in any way.
5. The Owner must ensure compliance with all terms and conditions of this Certificate. Any non-compliance constitutes a violation of the Act and is grounds for enforcement.
6. (a) The Owner shall, forthwith upon request of the Director, District Manager, or Provincial Officer (as defined in the Act), furnish any information requested by such persons with respect to compliance with this Certificate, including but not limited to, any records required to be kept under this Certificate; and

- (b) In the event the Owner provides the Ministry with information, records, documentation or notification in accordance with this Certificate (for the purposes of this condition referred to as "Information"),
- (i) the receipt of Information by the Ministry;
 - (ii) the acceptance by the Ministry of the Information's completeness or accuracy; or
 - (iii) the failure of the Ministry to prosecute the Owner, or to require the Owner to take any action, under this Certificate or any statute or regulation in relation to the Information;
- shall not be construed as an approval, excuse or justification by the Ministry of any act or omission of the Owner relating to the Information, amounting to non-compliance with this Certificate or any statute or regulation.
7. The Owner shall allow Ministry personnel, or a Ministry authorized representative(s), upon presentation of credentials, to:
- (a) carry out any and all inspections authorized by Section 156, 157 or 158 of the Act, Section 15, 16 or 17 of the OWRA, or Section 19 or 20 of the Pesticides Act, R.S.O. 1990, as amended from time to time, of any place to which this Certificate relates; and,
 - (b) without restricting the generality of the foregoing, to:
 - (i) enter upon the premises where records required by the conditions of this Certificate are kept;
 - (ii) have access to and copy, at reasonable times, any records required by the conditions of this Certificate;
 - (iii) inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required by the conditions of this Certificate; and
 - (iv) sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this Certificate.
8. Where there is a conflict between a provision of any document referred to in Schedule "A", and the conditions of this Certificate, the conditions in this Certificate shall take precedence. Where there is a conflict between the documents listed in Schedule "A", the document bearing the most recent date shall prevail.
9. Any information relating to this Certificate and contained in Ministry files may be made available to the public in accordance with the provisions of the *Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, C. F-31.
10. All records and monitoring data required by the conditions of this Certificate must be kept on the Owner's premises for a minimum period of five (5) years from the date of their creation.

11. (a) The Owner shall notify the District Manager in writing within thirty (30) days of becoming aware of any of the following changes:
- (i) change of Owner/Operator of the Site or both; and
 - (ii) address of the new Owner or change of address.
- (b) In the event of any change in ownership of the Site, the Owner shall notify in writing the succeeding owner of the existence of this Provisional Certificate of Approval, and a copy of such notice shall be forwarded to the Director.

Certificate of Prohibition / Registration on Title

12. Pursuant to Section 197 of the Act, neither the Owner nor any person having an interest in the Site shall deal with the Site in any way without first giving a copy of this Certificate to each person acquiring an interest in the Site as a result of the dealing. The Owner shall:
- (a) Within sixty (60) calendar days of the date of this Certificate, submit to the Director for the Director's signature two (2) copies of a completed Certificate of Prohibition containing a registerable description of the Site, in accordance with Form 1 of O. Regulation 14/92 (Document General - Form 4 - *Land Registration Reform Act*); and
 - (a) Within ten (10) calendar days of receiving the Certificate of Prohibition signed by the Director, register the Certificate of Prohibition in the appropriate Land Registry Office on title to the Site and submit to the Director immediately following registration the duplicate registered copy.

Site Operations

13. The Site shall not receive waste for landfilling.
14. The Owner shall close the Site by:
- (a) removing all remaining waste from the surface of Site, including all litter accumulated outside the Limit of Fill;
 - (b) grading of the property;
 - (c) placement of final cover; and
 - (d) seeding of the cover material with vegetation as soon as practical;
- all as described in Item 2 of Schedule "A".
15. The Site closure shall be carried out in a manner which protects adjacent properties, nearby water courses and natural drainage paths from Site surface runoff.
16. (a) The Owner shall maintain the Site in a manner which ensures the health and safety of all persons and the protection of the environment through active prevention of any possible environmental adverse effects, including but not be limited to soil erosion into natural watercourses, litter, vectors and vermin.

- (b) If at any time problems such as vectors or vermin are generated at the Site, the Owner shall take appropriate, immediate remedial action to eliminate the problem.

Inspections

17. The Owner shall conduct Site inspections according to the following schedule:
- (a) every two (2) weeks for a six (6) month period following the application of final cover and vegetation;
 - (b) monthly for the period from six (6) to twelve (12) months following the application of final cover and vegetation;
 - (c) quarterly following one (1) year after application of final cover and vegetation; and
 - (d) at the discretion of the District Manager following two (2) years after application of final cover and vegetation.
18. The Site inspections shall consist of:
- (a) a visual inspection of
 - (i) integrity of the landfill cover;
 - (ii) buffer area and adjacent properties;
 - (iii) entrance gate and perimeter fencing;
 - (iv) monitoring wells;
 - (v) storm water system
 - (b) visual scan for evidence of leachate breakout/seepage; and
 - (c) litter pick-up
19. The Owner shall record the following information from the site inspection in a log book:
- (a) date of inspection;
 - (b) Site personnel conducting the inspection;
 - (c) areas inspected;
 - (d) deficiencies noted during the inspection;
 - (e) remedial action initiated as a result of noted deficiencies; and
 - (f) date that deficiencies were rectified.

Groundwater and Surface Water Monitoring

20. The Owner shall monitor groundwater and surface water according to the environmental monitoring program outlined in Schedule "B". Changes to Schedule "B" must be approved by the District Manager.
21. The Owner shall ensure that all monitoring wells which form part of any monitoring program are protected from damage. Any groundwater monitoring wells that are damaged shall be repaired, replaced forthwith or properly abandoned.

22. In the event that the results of the monitoring program show an exceedance of an indicator parameter trigger level, the Owner shall notify the District Manager as soon as reasonably possible and shall immediately conduct an investigation into the cause and the need for implementation of remedial or contingency actions in accordance with Schedule "C".

Annual Reports

23. By March 31 of each year, the Owner shall submit to the District Manager an annual monitoring report for the Landfill which shall include as a minimum, the following:
- (a) a drawing(s) of the Landfill indicating all groundwater and surface water monitoring locations;
 - (b) tables outlining monitoring locations, analytical parameters sampled and the frequency of sampling and measurements;
 - (c) an analysis and interpretation of the groundwater and surface water monitoring data, a review of the adequacy of the monitoring programs, conclusions of the monitoring data, and recommendations for any changes in monitoring programs that may be necessary;
 - (d) an assessment of surface water quality in respect to the PWQO; and
 - (e) an assessment of groundwater quality in relation to the Guideline and the Ontario Drinking Water Standard.
24. In the event that the results of the monitoring program are such that an off-site exceedance of the RUP, Ontario Drinking Water Standard or PWQO can reasonably be predicted to occur, the Owner shall include in the annual report:
- (a) the details of any such predicted off-site exceedance, including the assumptions upon which the prediction is based;
 - (b) a discussion of the modifications, if any, to intended operations which would be necessary to prevent the predicted off-site exceedance;
 - (c) a discussion of the modifications, if any, which should be made to the monitoring program; and
 - (d) a discussion of other mitigation measures or contingency actions, if any, which may be necessary to prevent off-site impacts.

Schedule "A"

This Schedule "A" forms part of this Provisional Certificate of Approval.

1. Application for a Provisional Certificate of Approval for a Waste Disposal Site signed by Mr. David Clifford, C.A.O. Clerk-Treasurer, Township of Douro-Dummer, dated April 07, 2002.
2. Closure Plan, Stoney Lake Road (North) Waste Disposal Site, prepared by Lakefield Research Limited, dated September 2000.
3. Township of Douro-Dummer, Report Addendum, prepared by Lakefield Research Limited, dated March 31, 2003.
4. Transfer/Deed of Land for Part of Lot 21, Concession 4, designated as Parts 1 & 2, Plan 45R-10681, dated February 27, 1996.
5. Memo from B.W. Metcalf, MOE, Water Resources Unit - Surface Water, Technical Support Section, Eastern Region, Re: Closure Plan review comments, dated March 19, 2001.
6. Memo from S. Ryan, MOE, Technical Support Section, Eastern Region, Re: Closure Plan review comments, dated June 13, 2001.

Schedule "B"

Groundwater Monitoring Program

Sampling Location	Parameters	Frequency
Short Suite Monitoring Wells: TW1-1, TW1-2, TW2-1, TW2-2, TW3-1, TW3-2, TW4-1, TW4-2, TW5-1, TW5-2	water level, pH, alkalinity, ammonia (Total), BOD, COD, calcium, chloride, conductivity, hardness, iron, magnesium, manganese, nitrate, nitrite, pH, potassium, sodium, TDS, TKN, TOC	semi-annual basis (spring and fall)
Extended Suite Monitoring Wells: TW6-1, TW6-2, TW7-1, TW7-2, TW8-2, TW9-1, TW9-2	short suite parameters plus: arsenic, barium, boron, chromium, DO, fluorene, lead, mercury, phenols, selenium, total cyanide, unionized ammonia, zinc	semi-annual basis (spring and fall)
VOC Monitoring Wells: TW2-2, TW6-2	In addition to the above noted parameters, these wells will also be analyzed for VOCs	semi-annual basis (spring and fall)

Surface Water Monitoring Program

Sampling Location	Parameters	Frequency
SW1, SW3, SW4, SW8	pH, conductivity, dissolved oxygen, temperature, velocity, alkalinity, chloride, conductivity, iron, manganese, phenols	three times per year (spring runoff, low flow period and late fall flow period)

Landfill Gas Monitoring

Sampling Location	Parameters	Frequency
TW-1, TW-2, TW-3, TW-4, TW-5	methane	semi-annually concurrent with groundwater sampling

Schedule "C"
Contingency Plan

Tier I - "Alert"

If the downstream concentration of any of the defined trigger mechanism parameters exceeds the 75th percentile of the upstream results in a given sampling year, then the trigger is activated. If the exceedance occurs three sampling events in a row, then Tier II is activated.

Tier II - "Confirmation"

Sampling shall be conducted on a monthly basis for three (3) months. If the exceedance is confirmed, the Owner shall initiate discussion with the MOE to define the optimum course of remedial action with six (6) months of the activation of the Tier II trigger.

Tier II - "Compliance"

Implementation of the remedial actions as agreed upon with the MOE.

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

The reason for Conditions 1, 3, 4, 5, 8, 9, 10 and 11 is to clarify the legal responsibilities and obligations imposed by this Provisional Certificate of Approval.

The reason for Condition 2 is to ensure that this Site is closed in accordance with the application submitted by the Owner, and not in a manner which the Director has not been asked to consider.

The reason for Conditions 6 and 7 is to ensure that appropriate Ministry staff have ready access to the Site in order to confirm that the Site has been closed and post-closure monitoring is undertaken according to this Certificate. The condition is supplementary to the powers afforded a Provincial Officer pursuant to the Act, the OWRA, and the Pesticides Act, as amended.

The reason for the Condition 12 is to prohibit any use being made of the lands after they cease to be used for waste disposal purposes within a period of twenty-five years from the year in which such land ceased to be used unless the approval of the Minister for the proposed use has been given. The purpose of this prohibition is to protect future occupants of the Site and the environment from any hazards which might occur as a result of waste being disposed of on the site. This prohibition and potential hazard should be drawn to the attention of future owners and occupants by the Certificate being registered on title.

The reason for Condition 13 is to clarify that the Owner is prohibited from depositing any additional waste on this Site.

The reason for Conditions 14, 15, 16, 17, 18, 19, 20, 21, 22 and 23 is to ensure that the Site is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.

This Provisional Certificate of Approval revokes and replaces Certificate(s) of Approval No. A340901 issued on September 17, 1982

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

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

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;

6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

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

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

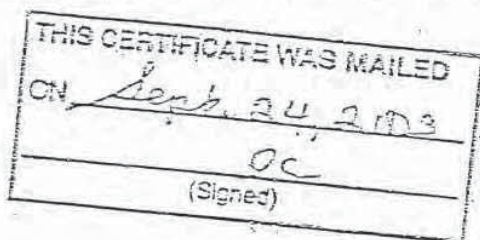
AND

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

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

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

DATED AT TORONTO this 11th day of September, 2003



Ian Parrott, P.Eng.
Director
Section 39, Environmental Protection Act

VZ/

c: District Manager, MOE Peterborough
Linda Elliot, SGS Lakefield Research Limited ✓



MEMORANDUM

July 30, 2014

TO: Chris Johnston
Senior Environmental Officer
Peterborough District Office
Eastern Region

FROM: Greg Faaren
Hydrogeologist
Technical Support Section
Eastern Region

RE: Stoney Lake Road Waste Disposal Site, 2013 Monitoring Report
Lot 21, Concession IV, Geographic Region of Duoro
Township of Duoro-Dummer, County of Peterborough, A340901

Purpose

I have reviewed the hydrogeologically pertinent sections of the document entitled "2013 Groundwater Monitoring Report, Stoney Lake Road Transfer Station, Township of Douro-Dummer, County of Peterborough, Project No. G024388 E1" dated March 2014 and prepared by Geo-Logic Inc. (GLI). This report was provided on behalf of Township of Douro-Dummer to fulfill the requirements of the Provisional Environmental Compliance Approval (ECA) for the site. I offer the following comments for your consideration.

Summary

- The Stoney Lake Road waste disposal site was closed in 2003 and final cover was applied to the waste mound in 2005. The site is currently operated as a waste transfer station.
- The Ministry applies Guideline B-7 Reasonable Use to all operating waste disposal sites, and sites that closed post 1986. Therefore Guideline B-7 is applicable to the Stoney Lake Road waste disposal site. GLI did not complete a Guideline B-7 Reasonable Use assessment as part of the 2013 annual monitoring report. A Reasonable Use assessment should be conducted as part of each annual report.
- GLI reports that several exceedances of the Ontario Drinking Water Quality Standards, Objectives and Guidelines (ODWSOG) were in the downgradient monitoring wells at the site in 2013. As such, the site is not in conformance with Guideline B-7. It is recommended that additional investigations be conducted to determine the extent of the leachate plume. Consideration should also be given to acquiring lands for a Contamination Attenuation Zone (CAZ) to the east of the landfill.

- The primary pathway for leachate migration is within the overburden and shallow bedrock to the east and southeast of the waste mound. Leachate impacted groundwater flows to the east from the waste mound, and is likely discharging to Lyon's Creek. The extent of the leachate plume is not delineated. It is recommended that additional monitoring wells be installed downgradient of the waste mound to better assess the quality of the groundwater immediately prior to discharging to Lyon's Creek. It is also recommended that groundwater in these wells be analyzed for the same suite of parameters as the surface water samples and with detection limits commensurate with the Provincial Water Quality Objectives (PWQO).
- GLI reports that methane was detected at monitoring well TW4-1. GLI reports that methane was not detected in the remaining monitoring wells. It is my understanding that passive landfill gas vents have been installed at the site; however the location of the vents were not provided in the report. It is also unknown if any landfill gas monitoring was conducted at the vents. The locations of the methane vents should be shown on the attached site plan and any monitoring data from the vents should be included as part of the annual report.
- Methane monitoring was not conducted in the on-site building. Given the concentrations of methane observed in some of the on-site monitoring wells, methane monitoring should be conducted in the on-site building.
- GLI indicates that there are some potential issues with the elevations of some of the monitoring wells. As such, GLI recommends that all of the wells at the site be surveyed by a licensed surveyor in 2014. I have no objections to this recommendation.
- GLI notes that as the background well TW8-2 has been repeatedly dry, a new background well is to be established at the site in 2014. I have no objections to this recommendation.
- It is recommended that historical groundwater sampling data and methane monitoring data be included as part of each annual report. The data should be provided in both hard copy and electronic format as well. It is also recommended that detailed trend analysis be conducted on the data as part of each annual report.
- It is recommended that additional hydrogeological information such as hydraulic conductivities and horizontal hydraulic gradients be provided as part of each annual monitoring report. Details regarding the type of material used to cap the landfill must also be provided.
- It is recommended that the figures provided in the report include the limits of the landfill site boundaries to better show the location of the site with respect to the monitoring well network and nearby site features.
- GLI recommends sampling the groundwater from all monitoring wells two (2) times per year for the parameters listed in Column 1 and 2 of Schedule 5 of the Landfill Standards Guideline (MOE, 1998) and the parameters listed in the ECA for the site. The reporting frequency is to be annual. I have no objections to this recommendation.

- As per the MOE's November 2010 Monitoring and Reporting for Waste Disposal Sites Technical Guidance Document, a Monitoring and Screening checklist is to be submitted with all 2011 annual monitoring reports. In reviewing the Stoney Lake Road waste disposal site report, it is noted that the checklist was not included. It is recommended that the 2014 report, and all subsequent future reports include a completed and signed checklist.

Environmental Compliance Approval (ECA)

The Stoney Lake Road waste disposal site previously operated under Provisional ECA A341004, however, the site stopped accepting waste in 2003 and began closure activities at that time. Final capping was reportedly completed in 2005. The site is located in Lot 21, Concession IV, Geographic Region of Duoro, Township of Douro-Dummer. The site is licensed for a 1.6 ha landfill within a 4.25 ha site. A groundwater monitoring program was implemented for the site as part of the post closure plan. The site currently operates as a waste transfer station.

According to MOE's November 2010 Monitoring and Reporting for Waste Disposal Sites Technical Guidance Document, and as communicated by the ministry (through webinars and information distributed in coordination with the Ontario Waste Management Association both last year and earlier this year), a Monitoring and Screening checklist is to be submitted with all annual monitoring reports, commencing in 2011. In reviewing the Stoney Lake Road waste disposal site report, it is noted that the checklist was included but was not completed or signed.

Geology

The consultants previously described the geology of the site as:

- A sand till unit;
- A silt to clay unit; and
- A limestone bedrock unit (Trenton-Black River Group).

The depth of overburden at the site is variable but is typically less than 5 m in thickness.

Hydrogeology

GLI provides limited information regarding the physical hydrogeological characteristics of the site. GLI reports that groundwater flow occurs within the deeper overburden and shallow fractured bedrock. Groundwater flows to the east to southeast towards a local wetland. No information regarding the horizontal hydraulic gradients or hydraulic conductivities on-site was provided in the report.

GLI reports that there are currently fifteen (15) nested monitoring wells at the site, however in 2013 groundwater samples were unable to be collected from wells TW-3-2, TW-4-2, TW-8-1 and TW-8-2.

GLI indicates that there are some potential issues with the elevations of some of the monitoring wells. As such, GLI recommends that all of the wells at the site be surveyed by a licensed surveyor in 2014. GLI also notes that as the background wells TW8-2 has been repeatedly dry, a new background well is to be established at the site in 2014.

Background Water Quality

GLI has used monitoring wells TW8-1 and TW8-2 to represent background water quality for the site. These monitoring wells are located hydraulically upgradient of the waste piles and are considered representative of background conditions. GLI reports that groundwater samples were unable to be collected from wells TW8-1 and TW8-2 in 2013 as these wells were dry.

Leachate

GLI reports that monitoring wells TW2-2, TW3-1 and TW4-1 are showing elevated concentrations of several leachate indicator parameters. GLI reports that concentrations of one (1) or more of hardness, iron, manganese and dissolved organic carbon (DOC) exceeded the ODWSOG on at least one (1) occasion in 2013 from wells TW2-2, TW3-1 and TW4-1.

Downgradient Water Quality

The primary pathway for leachate migration is inferred to be within the deeper overburden and shallow bedrock in a northeasterly direction. GLI reports that concentrations of one (1) or more of alkalinity, DOC, iron, total dissolved solids (TDS) and manganese exceeded the ODWSOG on at least one (1) occasion in 2013 in monitoring wells TW5-1, TW5-2, TW6-1, TW6-2, TW7-2, TW9-1 and TW9-2. It is noted that monitoring wells TW6-1, TW6-2 and TW7-2 are located at the downgradient property boundary. The extent of the impacts beyond wells TW6-1, TW6-2 and TW7-2 is not known.

It is noted that historical data and trend analysis of the historical and current data were not provided in the report. Trend analysis is required to determine if concentrations of contaminants at this site are decreasing following capping of the landfill.

The results of the volatile organic compound (VOC) analyses conducted on the samples from the monitoring wells indicated that no VOCs were observed in any downgradient monitoring wells during the 2013 sampling events. As such, GLI reports that there were no exceedances of the ODWSOG for VOC parameters.

Groundwater/Surface Water Interaction

The site plans provided by GLI indicate that Lyon's Creek is located off-site to the northeast, east and southeast of the waste mound. GLI reports that groundwater flows towards Lyon's Creek. Therefore there is the potential that shallow groundwater discharges to the creek. The downgradient monitoring wells are showing leachate impacts and therefore there is the potential for groundwater to impact nearby surface water features.

Potable Groundwater Sampling

GLI indicates that there are no potable water wells located immediately downgradient of the landfill. There are also no water supply wells located between the landfill and Lyon's Creek. Therefore no residential water wells were sampled as part of the monitoring program.

Guideline B-7 Reasonable Use

GLI has not conducted a Reasonable Use assessment as previous MOE review comments dated January 17, 2006 indicated that Guideline B-9 was applicable to this site. Current Ministry policy indicates that Guideline B-7 applies to operating waste disposal sites and to site closed post 1986. Therefore Guideline B-7 Reasonable Use is applicable to the site. The data provided by GLI shows that several downgradient monitoring wells are showing leachate impacts at concentrations above the ODWSOG. Therefore the site is not in conformance with Guideline B-7.

Trigger Mechanisms/Contingency Plans

GLI indicates that groundwater is likely discharging to Lyon's Creek located to the northeast, east and southeast of the site. As such, GLI has provided trigger mechanisms and contingency plans based on surface water issues.

Final Cover

The landfill site was closed in 2003. Final capping of the landfill was completed in 2005, however details of the materials used for the capping were not provided.

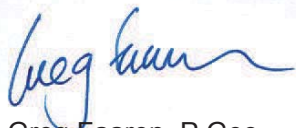
Landfill Gas Monitoring

Monitoring of the landfill gases generated at this site is conducted twice per year (i.e. spring and fall) by GLI. GLI reports that methane monitoring was conducted at the accessible monitoring wells. GLI reports that methane was detected at monitoring well TW4-2 (5 and 10 % by volume for the spring and fall monitoring events, respectively). GLI reports that methane was not detected in the remaining monitoring wells. However, it is noted that monitoring wells are not ideally suited for landfill gas monitoring.

It is my understanding that passive gas vents were previously installed at the site. However, the locations of these vents were not shown on the site plan provided. It is also unknown if methane monitoring was conducted at these vents. I also note that GLI does not indicate if methane monitoring was conducted in the on-site building.

Groundwater Monitoring

GLI recommends sampling the groundwater from all monitoring wells two (2) times per year (i.e. spring and fall) for the parameters listed in Column 1 and 2 of Schedule 5 of the Landfill Standards Guideline (MOE, 1998) and the parameters listed in the ECA for the site. The reporting frequency is to be annual.



Greg Faaren, P.Geo.
GF/gl

c: Laurel Rudd
File No. GW PB DD C4 01 03 (A340901)
GF/IDS# 6346-9AYLHZ / 1783-9KHR4Z

ec: Gillian Dagg-Foster
Jim Martherus

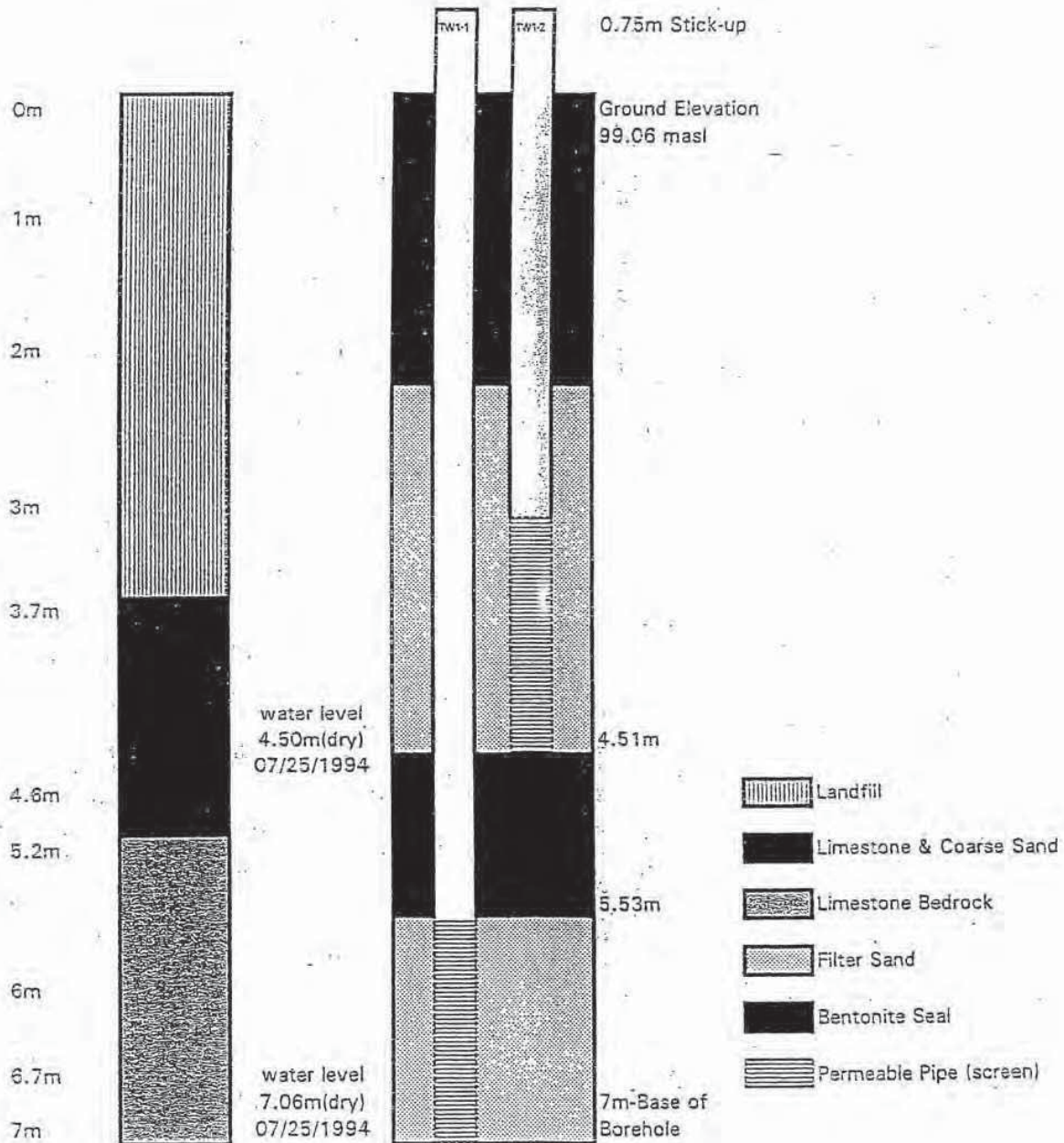
Appendix B

Monitoring Well Details and Borehole Data

Well Log and As-Built Diagrams for TW1 @Stoney Lake Road Landfill (Douro North)

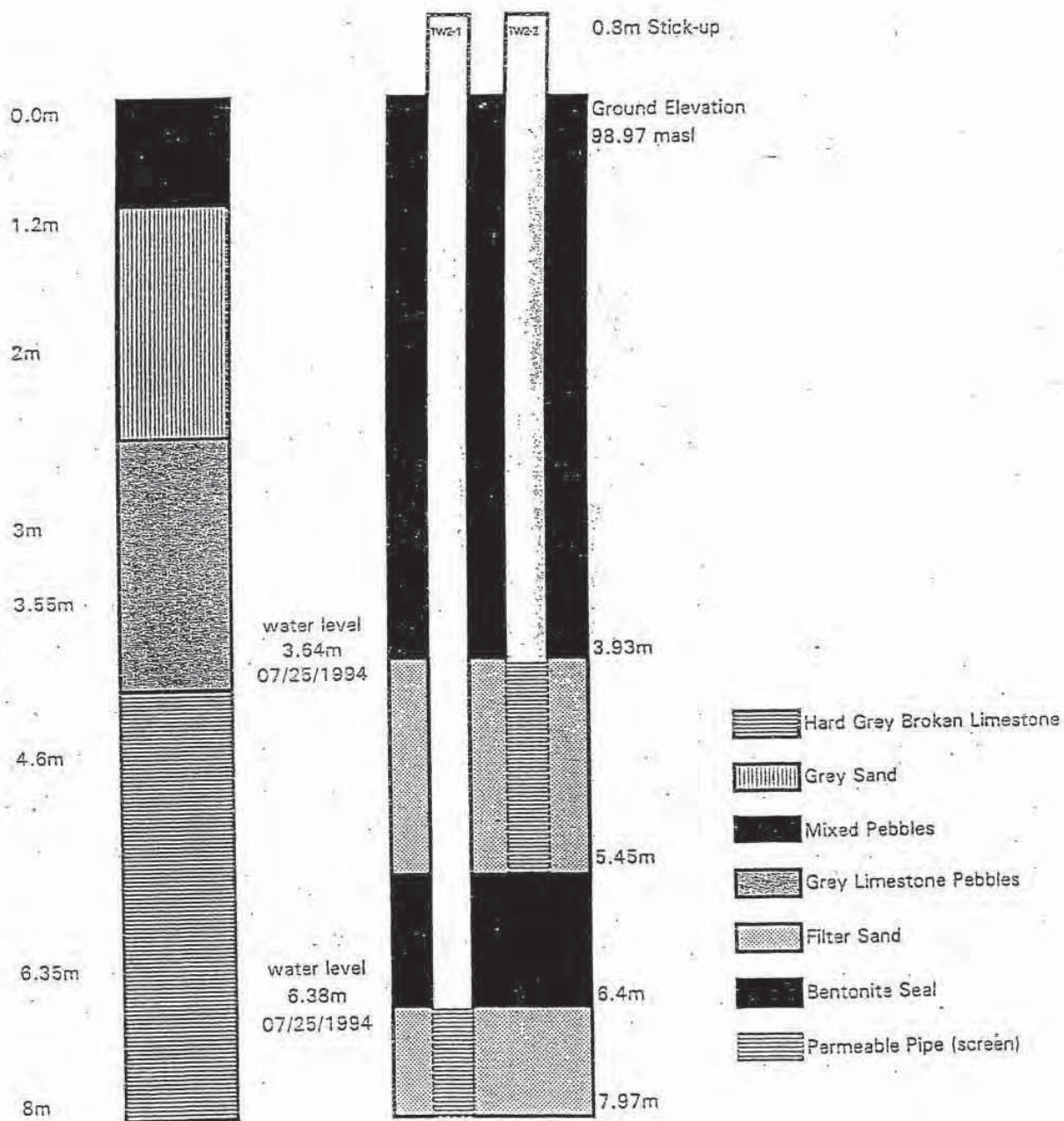
7777-096

Date Drilled: July 21 1994



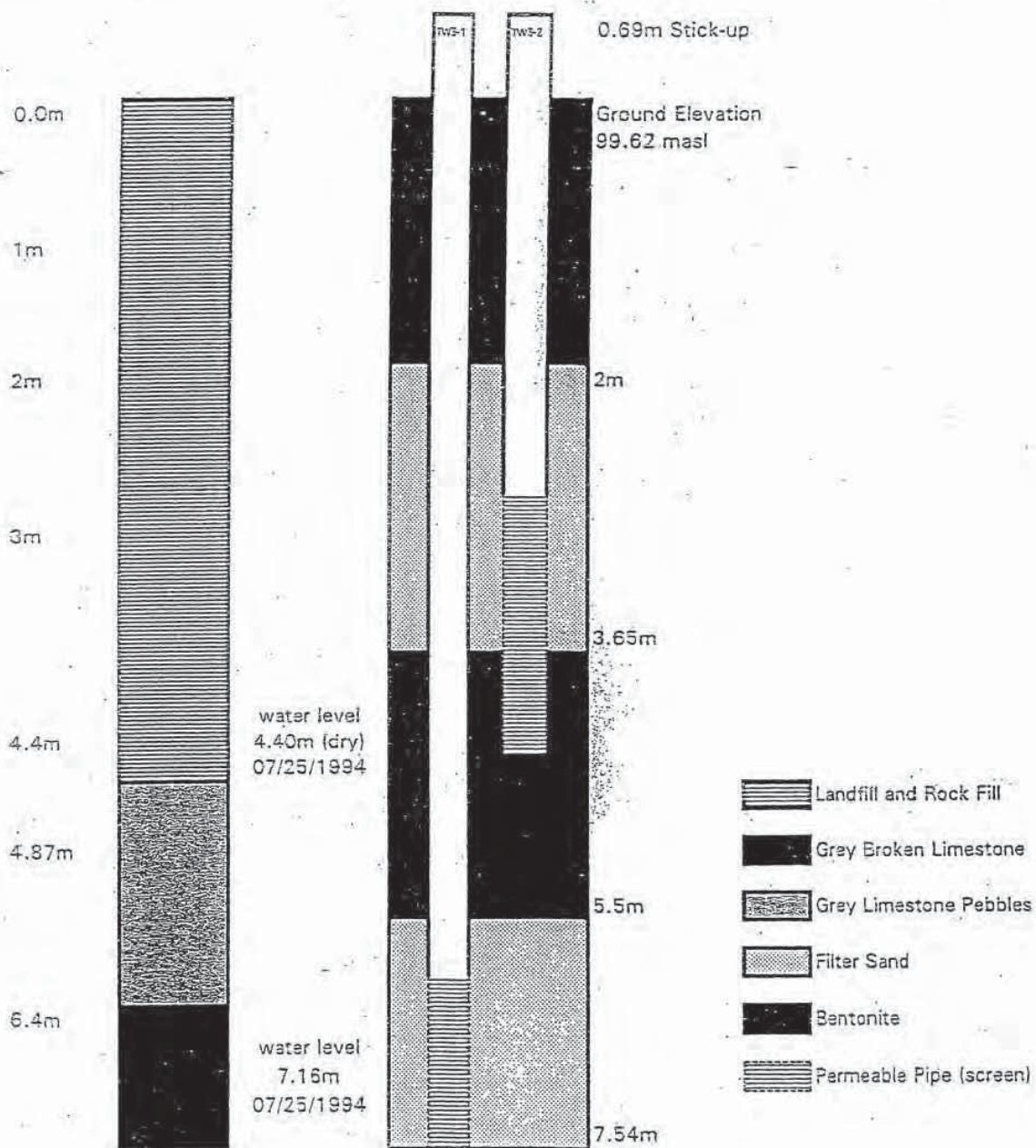
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Well Log and As-Built Diagrams for TW2 @Stoney Lake Road Landfill (Douro North)
 7777-096
 Date Drilled: July 21 1994



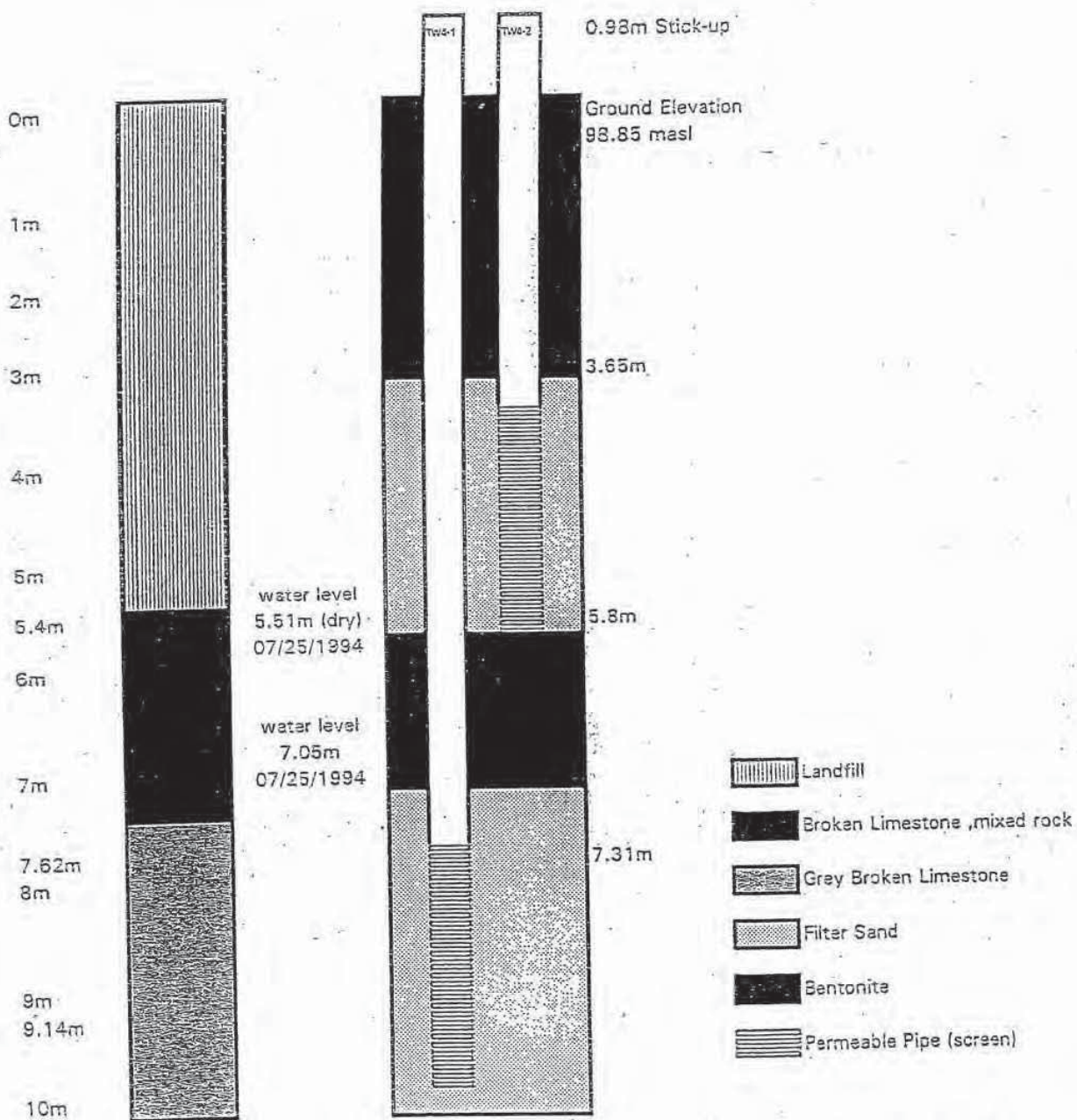
Not to Scale

Well Log and As-Built Diagrams for TW3 @Stoney Lake Road Landfill (Douro North)
 7777-096
 Date Drilled: July 21 1994



Not to Scale

Well Log and As-Built Diagrams for TW4 @Stoney Lake Road Landfill (Douro North)
 7777-096
 Date Drilled: July 21 1994

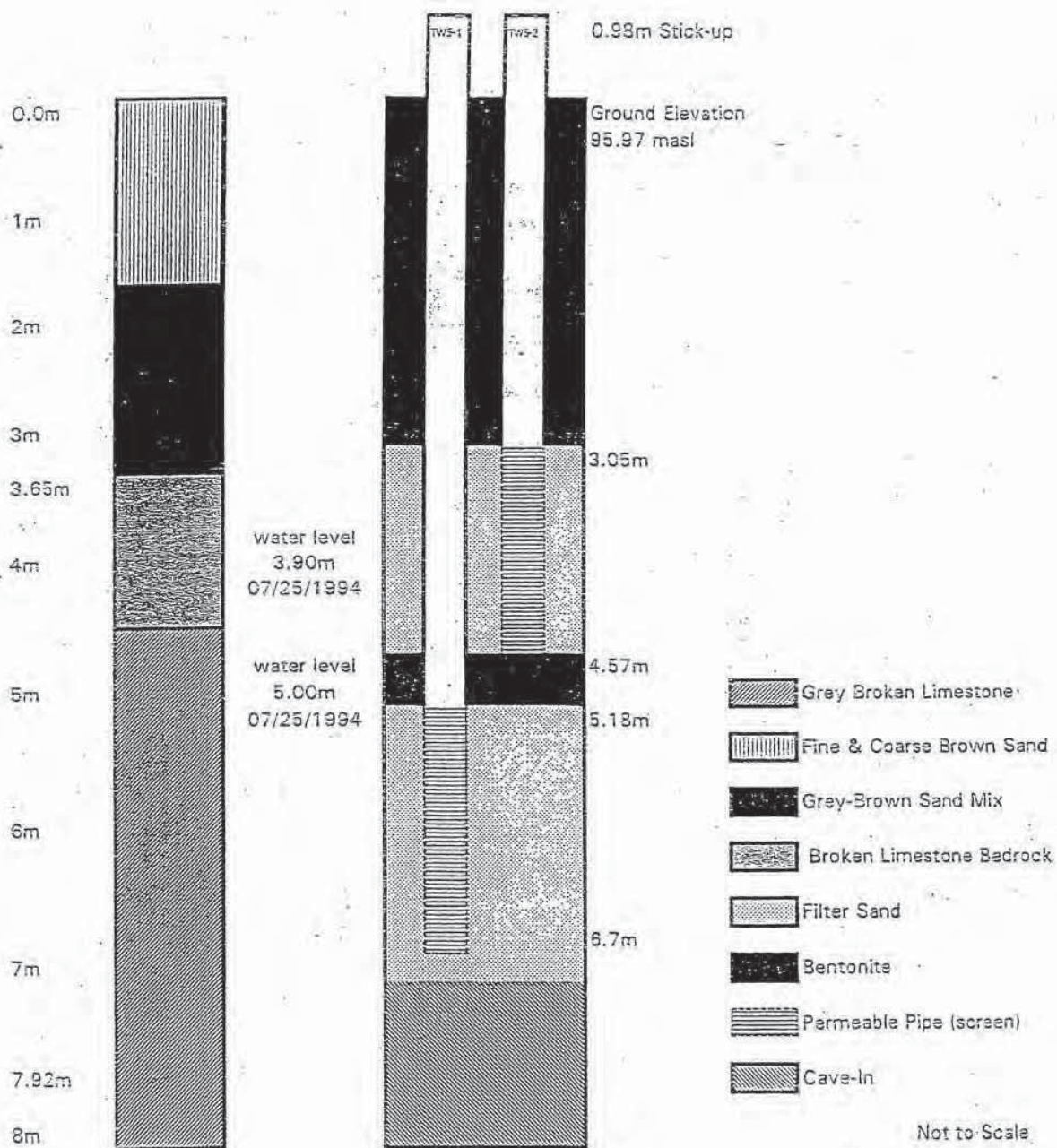


Not to Scale

Well Log and As-Built Diagrams for TW5 @Stoney Lake Road Landfill (Douro North)

7777-096

Date Drilled: July 21 1994



BOREHOLE LOG # TW 5-1		PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS		PROJECT No 7777-226	DATE DRILLED NOV 18, 1995	ELEVATION 95.258	SCALE NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE TYPE	N VALUE	COMMENTS
0			protective locking casing			Stick-up is 0.86m
1		Organic	cement			Water measurement taken after completion of well installation
2		SAND loose brown	bentonite			Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3			native fill			
4		BEDROCK fractured limestone	bentonite			Protective casing with lock was installed and cemented in place.
5			filter sand			1 1/4" PVC schedule 80 pipe and screen was installed.
6						Screen is 5' (1.52m) in length.
7						
8						
9						5.13m bottom of hole
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						



**LAKEFIELD
RESEARCH
LIMITED**
ENVIRONMENTAL SERVICES

185 CONCESSION STREET
LAKEFIELD, ONTARIO, CANADA

21, 1st AVENUE
SCHUMACHER, ONTARIO, CANADA

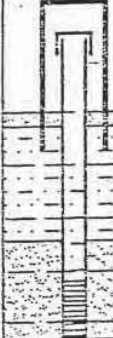
BOREHOLE LOG # TW 6-2		PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS		PROJECT No 7777-226	DATE DRILLED NOV 17, 1995	ELEVATION 95.024	SCALE NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	N VALUE	
0			protective locking casing			Stick-up is 0.87m
1		Organic	cement bentonite			Water measurement taken after completion of well installation
2		SAND loose brown				Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3			native fill			
4		BEDROCK fractured limestone				Protective casing with lock was installed and cemented in place.
5						2" PVC schedule 80 pipe and screen was installed.
6						Screen is 5' (1.52m) in length.
7						
8						
9						3.35m bottom of hole
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						

BOREHOLE LOG # TW 7-1		PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS		PROJECT No 7777-225	DATE DRILLED NOV 20, 1995	ELEVATION 94.315	SCALE NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	N VALUE	
0			protective locking casing			Stick-up is 0.92m
1		Organic SAND dark brown with Organics	cement bentonite			Water measurement taken after completion of well installation
2		Silt compact grey				Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3		SAND grey wet loose				Protective casing with lock was installed and cemented in place.
4			native fill			1 1/4" PVC schedule 80 pipe and screen was installed.
5						Screen is 5' (1.52m) in length.
6		BEDROCK fractured limestone	bentonite			9.25m bottom of hole
7						
8			filter sand			
9						
10						
11						
12						
13						
14						
15						
16						
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18						
19						

BOREHOLE LOG # TW 7-2		PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS		PROJECT No 7777-226	DATE DRILLED NOV 20, 1995	ELEVATION 94.395	SCALE NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS		SAMPLE		COMMENTS
					TYPE	VALUE	
			protective locking casing				Stick-up is 1.02m
0		Organic	cement				Water measurement taken after completion of well installation
1		SAND dark brown with Organics	bentonite				Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
2		Silt compact grey					
3		SAND grey wet loose	filter sand				Protective casing with lock was installed and cemented in place.
4							2" PVC schedule 80 pipe and screen was installed.
5							Screen is 5' (1.52m) in length.
6		BEDROCK fractured limestone					4.27m bottom of hole
7							
8							
9							
10							
11							
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17							
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19							

 **LAKEFIELD
RESEARCH
LIMITED**
ENVIRONMENTAL SERVICES

135 CONCESSION STREET
LAKEFIELD, ONTARIO, CANADA
21, 1st AVENUE
SCHUMACHER, ONTARIO, CANADA

BOREHOLE LOG # TW 8-1		PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS		PROJECT No 7777-226	DATE DRILLED NOV 30, 1995	ELEVATION 100.094	SCALE NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE TYPE	COMMENTS
0		Organic	protective locking casing		Stick-up is 1.33m
1		CLAY dark brown	cement bentonite		Water measurement taken after completion of well installation
2		SAND grey with GRAVEL	native fill		Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3			bentonite		Protective casing with lock was installed and cemented in place.
4					
5			native fill		1 1/4" PVC schedule 80 pipe and screen was installed.
6		BEDROCK fractured limestone			Screen is 5' (1.52m) in length.
7			bentonite		
8					10.97m bottom of hole
9			filter sand		
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					

**LAKEFIELD
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ENVIRONMENTAL SERVICES

135 CONCESSION STREET
LAKEFIELD, ONTARIO, CANADA
21, 1st AVENUE
SCHUMACHER, ONTARIO, CANADA

BOREHOLE LOG # TW 8-2		PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS		PROJECT No 7777-226	DATE DRILLED NOV. 30, 1995	ELEVATION 100.094	SCALE NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	VALUE	
0			protective locking casing			Stick-up is 1.33m
1		Organic	cement bentonite			Water measurement taken after completion of well installation
2		CLAY dark brown				Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3		SAND grey with GRAVEL				Protective casing with lock was installed and cemented in place.
4			native fill			2" PVC schedule 80 pipe and screen was installed.
5						Screen is 5' (1.52m) in length.
6		BEDROCK fractured limestone	bentonite			4.32m bottom of hole
7			filter sand			
8						
9						
10						
11						
12						
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14						
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16						
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19						

**LAKEFIELD
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ENVIRONMENTAL SERVICES

135 CONCESSION STREET
LAKEFIELD, ONTARIO, CANADA
21, 1st AVENUE
SCHUMACHER, ONTARIO, CANADA

BOREHOLE LOG

BH9-1PROJECT NAME
TOWNSHIP OF DOURO
STONE LAKE ROAD LANDFILLLOGGED BY D. BUCHOLTZ
LAKEFIELD RESEARCH LIMITED

DRILLING METHOD

HOLLOW STEM AUGER

PROJECT No
7777-371DATE DRILLED
AUGUST 19, 1997GROUND ELEV.
N/A

SCALE

NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS		SAMPLE		COMMENTS
					TYPE	N VALUE	
0			PROTECTIVE CASING				Drilling commenced 08:00hrs, Aug 19/97
			CEMENT				Well instrumented with dedicated inertic pump upon completion.
1		ORGANIC, overburden					TW9-1 has 50MM PVC Schedule 40 riser pipe and 1.52m No.10 slotted screen
2		SILT, till, grey, wet					
3			BENTONITE				
4							
5							
6		BEDROCK, limestone					
7							
8			SILICA SAND				Water was encountered @ 8.84m (29ft) below grade.
9							Bottom of hole at 9.60m (31.5ft) below grade.



**LAKEFIELD
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ENVIRONMENTAL SERVICES

185 CONCESSION STREET
LAKEFIELD, ONTARIO, CANADA21, 1st AVENUE
SCHUMACHER, ONTARIO, CANADA

BOREHOLE LOG	# BH9-2	PROJECT NAME TOWNSHIP OF DOURO STONE LAKE ROAD LANDFILL		LOGGED BY D. BUCHOLTZ LAKEFIELD RESEARCH LIMITED	
		DRILLING METHOD HOLLOW STEM AUGER	PROJECT No 7777-371	DATE DRILLED AUGUST 19, 1997	GROUND ELEV. N/A

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS		SAMPLE		COMMENTS
					TYPE	N VALUE	
0			PROTECTIVE CASING				Drilling commenced 13:30hrs. Aug 19/97
			CEMENT				Well instrumented with dedicated inertia pump upon completion.
1		ORGANIC, overburden					TW9-2 has 50MM PVC Schedule 40 riser pipe and 1.52m No.10 slotted screen
2		SILT, till, grey, wet	SILCA SAND				Water was encountered @ 1.83m (6ft) below grade.
3			BENTONITE				Bottom of hole at 3.51m (11.5ft) below grade.
4							
5							
6		BEDROCK, limestone					
7							
8							
9							

**LAKEFIELD
RESEARCH
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ENVIRONMENTAL SERVICES

195 CONCESSION STREET
LAKEFIELD, ONTARIO, CANADA
21, 1st AVENUE
SCHUMACHER, ONTARIO, CANADA

Well Owner's Information

First Name Eric	Last Name / Organization Dave Clifford	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) 8094 South Street		Municipality Warsaw	Province ON
		Postal Code K4L3A0	Telephone No. (inc. area code)

Well Location

Address of Well Location (Street Number/Name) 318 HURON ST. County Rd 6		Township	Lot	Concession
County/District/Municipality		City/Town/Village YONGE POINT	Province Ontario	Postal Code
UTM Coordinates NAD 83	Zone 17	Easting 700852	Northings 4946690	Municipal Plan and Sublot Number

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BRN	GRAVEL		LOOSE	0	2
BRN	SILT	CLAY	SOFT	2	6
GRY	CLAY	SILT	SOFT	6	7
BLK	FILL		SOFT	7	12

Annular Space				Results of Well Yield Testing			
Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was: <input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____	Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)
0	6	BENTONITE		If pumping discontinued, give reason: Static Level	1		1
6	12	SAND			2		2
					3		3
					4		4
					5		5
					10		10
					15		15
					20		20
					25		25
					30		30
					40		40
					50		50
					60		60

Method of Construction		Well Use	
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input type="checkbox"/> Domestic	<input type="checkbox"/> Municipal
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning
<input type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial	
<input type="checkbox"/> Other, specify Auger		<input type="checkbox"/> Other, specify _____	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To	
	PLASTIC		+3	7	<input type="checkbox"/> Water Supply
					<input type="checkbox"/> Replacement Well
					<input checked="" type="checkbox"/> Test Hole
					<input type="checkbox"/> Recharge Well
					<input type="checkbox"/> Dewatering Well
					<input type="checkbox"/> Observation and/or Monitoring Hole
					<input type="checkbox"/> Alteration (Construction)
					<input type="checkbox"/> Abandoned, Insufficient Supply
					<input type="checkbox"/> Abandoned, Poor Water Quality
					<input type="checkbox"/> Abandoned, other, specify _____
					<input type="checkbox"/> Other, specify _____

Construction Record - Screen			
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From
2	PLASTIC	10	7

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Depth (m/ft) From	Diameter (cm/in)
		0	12
			6

Well Contractor and Well Technician Information			
Business Name of Well Contractor Strata Soil Sampling		Well Contractor's Licence No. 71291	
Business Address (Street Number/Name) 165 Shields Court		Municipality Markham	
Province ON	Postal Code M3B 8V2	Business E-mail Address	
Bus. Telephone No. (inc. area code) (905) 940-7919		Name of Well Technician (Last Name, First Name) PAUL BILLY CLIFFORD	
Well Technician's Licence No. 7716		Signature of Technician and/or Contractor [Signature]	
		Date Submitted 2015 01/23	

Map of Well Location			
Please provide a map below following instructions on the back.			
<p>SEE ATTACHED MAP (NW6)</p>			

Comments:	
Well owner's information package delivered <input type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered 2014/12/12
Date Work Completed 2014/12/12	Ministry Use Only Audit No. 200302
Received	

Well Owner's Information

First Name CLIFFORD	Last Name / Organization Dave Clifford Township of Douro-Dummer	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) 894 Smith Street	Municipality Warsaw	Province ON	Postal Code K0L3A0
Telephone No. (inc. area code)			

Well Location

Address of Well Location (Street Number/Name) 348 County Rd 6	Township	Lot	Concession
County/District/Municipality	City/Town/Village Youngs Point	Province Ontario	Postal Code
UTM Coordinates Zone 17N Easting 720906 Northing 4926628	Municipal Plan and Sublot Number	Other	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
				From To
Brown	Fill	Gravel	Loose	0 1
Brown	Silt	Clay	Soft	1 6
Grey	Clay	Silt	Soft	6 7
Black	Fill			7 11

Annular Space			Results of Well Yield Testing					
Depth Set at (m/ft)		Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was: <input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____ If pumping discontinued, give reason: Pump intake set at (m/ft)	Draw Down		Recovery	
From	To				Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
0	5	PENONITE						
5	11	SAND						

Method of Construction	Well Use
<input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary (Conventional) <input type="checkbox"/> Rotary (Reverse) <input type="checkbox"/> Boring <input type="checkbox"/> Air percussion <input type="checkbox"/> Other, specify Auger	<input type="checkbox"/> Public <input type="checkbox"/> Domestic <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="checkbox"/> Other, specify <input type="checkbox"/> Commercial <input type="checkbox"/> Municipal <input checked="" type="checkbox"/> Test Hole <input type="checkbox"/> Cooling & Air Conditioning <input type="checkbox"/> Not used <input type="checkbox"/> Dewatering <input type="checkbox"/> Monitoring

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From To		
	Plastic		10 6		

Construction Record - Screen				Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		
			From To		
2	Plastic	10	6 11		

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify	Depth (m/ft)	Diameter (cm/in)
		From To	
		0 11	6

Well Contractor and Well Technician Information			
Business Name of Well Contractor Strata Soil Sampling	Well Contractor's Licence No. 71741		
Business Address (Street Number/Name) 165 Shields Court	Municipality Markham		
Province ON	Postal Code L3R 9U2	Business E-mail Address	

Bus. Telephone No. (inc. area code) (905) 940-7919	Name of Well Technician (Last Name, First Name) Baronette Thie
Well Technician's Licence No. 9716	Signature of Technician and/or Contractor [Signature]
Date Submitted 2015 01 23	

Map of Well Location			
Please provide a map below following instructions on the back.			
<p>SEE ATTACHED MAP (p. 5)</p>			
Comments:			

Well owner's information package delivered	Date Package Delivered	Ministry Use Only	
<input type="checkbox"/> Yes <input type="checkbox"/> No		Audit No. 200301	
	Date Work Completed 2014/12/12	Received	

Well Owner's Information

First Name Steve	Last Name / Organization Dave Clifford Township of Douro - Dummer	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) 894 South Street	Municipality Narsaw	Province ON	Postal Code K0L3A0

Well Location

Address of Well Location (Street Number/Name) 348 County Rd 6	Township	Lot	Concession
County/District/Municipality	City/Town/Village YORKVILLE	Province Ontario	Postal Code
UTM Coordinates NAD 83 17 720 904 492466 E51	Municipal Plan and Sublot Number		Other

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
Brown	TOP SOIL		Loose	0 to 2
Brown	FILL		Loose	2 to 9
Grey	Limestone	Bedrock		9 to 20

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/lb³)	After test of well yield, water was:			
0 to 9	Grout		<input type="checkbox"/> Clear and sand free	Draw Down		
9 to 20	SAND		<input type="checkbox"/> Other, specify	Time (min)	Water Level (m/ft)	Recovery
			If pumping discontinued, give reason:			
				Static Level		
				1		1
				2		2
				3		3
				4		4
			Pump intake set at (m/ft)	5		5
			Pumping rate (l/min / GPM)	10		10
			Duration of pumping	15		15
			hrs + min	20		20
			Final water level end of pumping (m/ft)	25		25
			If flowing give rate (l/min / GPM)	30		30
			Recommended pump depth (m/ft)	40		40
			Recommended pump rate (l/min / GPM)	50		50
			Well production (l/min / GPM)	60		60
			Disinfected?			
			<input type="checkbox"/> Yes <input type="checkbox"/> No			

Method of Construction		Well Use	
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input type="checkbox"/> Domestic	<input type="checkbox"/> Municipal
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning
<input checked="" type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial	
<input type="checkbox"/> Other, specify		<input type="checkbox"/> Other, specify	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From To	<input type="checkbox"/> Water Supply	
	Plastic		+3 16	<input type="checkbox"/> Replacement Well	
				<input checked="" type="checkbox"/> Test Hole	
				<input type="checkbox"/> Recharge Well	
				<input type="checkbox"/> Dewatering Well	
				<input checked="" type="checkbox"/> Observation and/or Monitoring Hole	
				<input type="checkbox"/> Alteration (Construction)	
				<input type="checkbox"/> Abandoned, Insufficient Supply	
				<input type="checkbox"/> Abandoned, Poor Water Quality	
				<input type="checkbox"/> Abandoned, other, specify	
				<input type="checkbox"/> Other, specify	

Construction Record - Screen			
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)
2	Plastic	10	10 20

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify	Depth (m/ft)	Diameter (cm/in)
		From To	
		0 9	5"
		9 20	3.5"

Well Contractor and Well Technician Information	
Business Name of Well Contractor Strata Soil Sampling	Well Contractor's Licence No. 7244V
Business Address (Street Number/Name) 165 Shields Court	Municipality Markham
Province ON	Postal Code L3R 8V2
Business E-mail Address	

Bus. Telephone No. (inc. area code) (905) 940-7919	Name of Well Technician (Last Name, First Name) Jonathan Smith
Well Technician's Licence No. 3410	Signature of Technician and/or Contractor <i>[Signature]</i>
	Date Submitted 2015/01/23

Map of Well Location			
Please provide a map below following instructions on the back.			

Comments:

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
<input type="checkbox"/> Yes <input type="checkbox"/> No		Audit No. 200299
	Date Work Completed	Received
	Nov 14/12/12	

Well Owner's Information

First Name Steve	Last Name / Organization Dave Clifford Township of Douro	E-mail Address Bummer	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) 894 South Street	Municipality Warsaw	Province ON	Postal Code K10L3A10

Well Location

Address of Well Location (Street Number/Name) 398 County Rd 6	Township	Lot	Concession
County/District/Municipality	City/Town/Village Voules Pt.	Province Ontario	Postal Code
UTM Coordinates Zone 17N	Easting 888149	Northing 617123	Municipal Plan and Sublot Number
Other			

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
BEN	TOP SOIL		LOOSE	0 2
BEN	SIG	CLAY	SOFT	2 3
GRA	LIMSTONE	BEDROCK	BEDROCK	3 10

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft)	From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	After test of well yield, water was:	Draw Down
0	4		PENETRA		<input type="checkbox"/> Clear and sand free	Time (min)
4	10		SAND		<input type="checkbox"/> Other, specify	Water Level (m/ft)
					If pumping discontinued, give reason:	Recovery
					Static Level	Time (min)
					1	1
					Pump intake set at (m/ft)	2
					3	3
					Pumping rate (l/min / GPM)	4
					Duration of pumping	5
					hrs + min	5
					Final water level end of pumping (m/ft)	10
					If flowing give rate (l/min / GPM)	15
					20	20
					Recommended pump depth (m/ft)	25
					30	30
					Recommended pump rate (l/min / GPM)	40
					50	50
					Well production (l/min / GPM)	60
					Disinfected?	60
					<input type="checkbox"/> Yes <input type="checkbox"/> No	

Method of Construction	Well Use
<input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary (Conventional) <input type="checkbox"/> Rotary (Reverse) <input type="checkbox"/> Boring <input checked="" type="checkbox"/> Air Percussion <input type="checkbox"/> Other, specify	<input type="checkbox"/> Public <input type="checkbox"/> Domestic <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="checkbox"/> Other, specify
<input type="checkbox"/> Diamond <input type="checkbox"/> Jetting <input type="checkbox"/> Driving <input type="checkbox"/> Digging	<input type="checkbox"/> Commercial <input type="checkbox"/> Not used <input type="checkbox"/> Municipal <input type="checkbox"/> Dewatering <input type="checkbox"/> Test Hole <input type="checkbox"/> Monitoring <input type="checkbox"/> Cooling & Air Conditioning

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	From	To
	PLASTIC		+3	5	

Construction Record - Screen				Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	From	To
2	PLASTIC	10	5	10	

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	Depth (m/ft)	Diameter (cm/in)
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify	From	To
		0	3
		3	10

Well Contractor and Well Technician Information

Business Name of Well Contractor Shasta Soil Sampling	Well Contractor's Licence No. 212141
Business Address (Street Number/Name) 165 Shields Court	Municipality Markham
Province ON	Postal Code L3R 8U2
Business Telephone No. (inc. area code) 905-494-7919	Name of Well Technician (Last Name, First Name) JOHN CLIFFORD
Well Technician's Licence No. 212141	Signature of Technician and/or Contractor JOHN CLIFFORD
Date Submitted 2015/01/23	

Map of Well Location			
Please provide a map below following instructions on the back.			
SEE ATTACHED MAP (HW3)			

Comments:

Well owner's information package delivered <input type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered 2014/12/12	Date Work Completed 2014/12/12
Ministry Use Only		Audit No. 200300
Received		

Well Owner's Information

First Name Steve	Last Name / Organization Dave Clifford Township of Douro-Dummer	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) 894 Smith Street	Municipality Narsaw	Province ON	Postal Code K101L3A10
Telephone No. (inc. area code)			

Well Location

Address of Well Location (Street Number/Name) 348 Country Rd 6	Township	Lot	Concession
County/District/Municipality	City/Town/Village Vank's Point	Province Ontario	Postal Code
UTM Coordinates NAD 83 17 720 761 492 6788	Municipal Plan and Sublot Number	Other	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Bru	Top Soil		Loose	0	2
brw	Soil	CLAY	Soft	2	8
GRY	Limestone	Bedrock	Bedrock	8	85

Annular Space			Volume Placed (m³/ft³)
Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	
0	24	RENTONITE	
24	35	SAND	

Method of Construction		Well Use	
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input type="checkbox"/> Domestic	<input type="checkbox"/> Municipal
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input checked="" type="checkbox"/> Test Hole
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Monitoring
<input checked="" type="checkbox"/> Air Percussion		<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling & Air Conditioning
<input type="checkbox"/> Other, specify		<input type="checkbox"/> Other, specify	

Results of Well Yield Testing				
After test of well yield, water was: <input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: Static Level				
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping hrs + min	4		4	
Final water level end of pumping (m/ft)	5		5	
If flowing give rate (l/min / GPM)	10		10	
	15		15	
Recommended pump depth (m/ft)	20		20	
	25		25	
Recommended pump rate (l/min / GPM)	30		30	
	40		40	
Well production (l/min / GPM)	50		50	
	60		60	
Disinfected? <input type="checkbox"/> Yes <input type="checkbox"/> No				

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input checked="" type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify <input type="checkbox"/> Other, specify
			From	To	
			+3	25	

Construction Record - Screen				
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To
2		10	25	35

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify	Depth (m/ft) From	To
		0	8
		8	35

Diameter (cm/in)	
5	
3.5	

Well Contractor and Well Technician Information			
Business Name of Well Contractor Strata Soil Sampling		Well Contractor's Licence No. 7741	
Business Address (Street Number/Name) 165 Shields Court		Municipality Markham	
Province ON	Postal Code L3R8R2	Business E-mail Address	
Bus. Telephone No. (inc. area code) 905-940-7919		Name of Well Technician (Last Name, First Name) Marcelle Orie	
Well Technician's Licence No. 77416		Signature of Technician and/or Contractor [Signature]	
Date Submitted 2015 01 23			

Map of Well Location

Please provide a map below following instructions on the back.

SEE ATTACHED
MAP
(TW-8D)

Comments:

Well owner's information package delivered <input type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered 2015 01 23	Ministry Use Only Audit No. 200305 Received
	Date Work Completed 2015 01 23	

Well Owner's Information

First Name Steve	Last Name / Organization Dave Clifford Township of Douro-Dummer	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) 894 South Street	Municipality Warsaw	Province ON	Postal Code K0L1Z4A0

Well Location

Address of Well Location (Street Number/Name) 348 County Rd 6	Township	Lot	Concession
County/District/Municipality	City/Town/Village Yolande Pt.	Province Ontario	Postal Code
UTM Coordinates Zone Easting Northing NAD 83 17 72 676599 26788	Municipal Plan and Sublot Number	Other	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BRN	TOP SOIL		LOOSE	0	2
BRN	SILT	CLAY	SOFT.	2	8
GLY	LIMESTONE		BEDROCK	8	15

Annular Space			
Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	7	BENTONITE	
7	15	SAND	

Method of Construction <input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary (Conventional) <input type="checkbox"/> Rotary (Reverse) <input type="checkbox"/> Boring <input checked="" type="checkbox"/> Air percussion <input type="checkbox"/> Other, specify _____	Well Use <input type="checkbox"/> Public <input type="checkbox"/> Domestic <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="checkbox"/> Other, specify _____	<input type="checkbox"/> Commercial <input type="checkbox"/> Not used <input type="checkbox"/> Dewatering <input checked="" type="checkbox"/> Test Hole <input checked="" type="checkbox"/> Monitoring <input type="checkbox"/> Cooling & Air Conditioning
---	--	---

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From	To	
	PLASTIC		+3	10	<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input checked="" type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

Construction Record - Screen				Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		
			From	To	
2	PLASTIC	10	10	15	<input type="checkbox"/> Other, specify _____

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Depth (m/ft) From	Diameter (cm/in) To
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	0	8 5
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	8	15 3.5

Business Name of Well Contractor Strata Soil Sampling	Well Contractor's Licence No. 71241
Business Address (Street Number/Name) 65 Shields Court	Municipality Markham
Province ON	Postal Code L3R1R8A1
Business E-mail Address	

Bus. Telephone No. (inc. area code) (905) 940-7919	Name of Well Technician (Last Name, First Name) FORNICKI JANE
Well Technician's Licence No. 31716	Signature of Technician and/or Contractor [Signature]
Date Submitted 2015/01/23	

Results of Well Yield Testing			
After test of well yield, water was:		Draw Down	
<input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____		Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Static Level	Recovery
Pump intake set at (m/ft)		1	1
Pumping rate (l/min / GPM)		2	2
Duration of pumping ____ hrs + ____ min		3	3
Final water level end of pumping (m/ft)		4	4
If flowing give rate (l/min / GPM)		5	5
Recommended pump depth (m/ft)		10	10
Recommended pump rate (l/min / GPM)		15	15
Well production (l/min / GPM)		20	20
Disinfected? <input type="checkbox"/> Yes <input type="checkbox"/> No		25	25
		30	30
		40	40
		50	50
		60	60

Map of Well Location

Please provide a map below following instructions on the back.

SEE ATTACHED MAP (TW-8)

Comments:

Well owner's information package delivered <input type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered	Ministry Use Only
Date Work Completed	Audit No. Z 200304	
Received		

Appendix C

Established Monitoring Program and Sampling Protocol

SECTION I: GROUNDWATER MONITORING AND SAMPLING PROTOCOL

1.0 WATER LEVEL MEASUREMENTS

1. Prior to purging/sampling, water levels shall be measured by the wetted-taped method or with an electric depth gauge to the nearest 0.01 metres (or 0.01 feet).
2. MEASUREMENTS SHALL BE TAKEN WITHOUT THE REMOVAL OF THE DEDICATED SAMPLING DEVICE. (tubing and foot-valve arrangements).
3. MEASUREMENTS SHALL BE TAKEN FROM TOP OF THE MONITORED WELL. IN MOST CASES, THE MEASUREMENT WILL BE TAKEN FROM TOP OF THE PVC CASING AND NOT THE TOP OF THE PROTECTIVE CASING.
4. Measurements shall be recorded on FORM 1 for each specific monitor in the log book, indicating MEASURING POINT.
5. Rinse tip of measuring device with distilled water after taking measurement in each monitor.

2.0 PURGING PROCEDURE

1. Prior to sampling, each well shall be purged to remove the stagnant water within the casing.
2. THREE CASING VOLUMES SHALL BE REMOVED BY THE DEDICATED SAMPLERS OR BY BAILER FROM THE WELLS WITH MODERATE INFLOW. THE PURGED WATER SHALL BE MEASURED INTO A CALIBRATED CONTAINER AND THE VOLUME REMOVED SHALL BE RECORDED ON FORM 2 FOR THE SPECIFIC MONITOR IN THE LOG BOOK.
3. SLOW INFLOW MONITORS SHALL BE PURGED ENTIRELY DRY. THE VOLUME OF PURGED WATER SHALL BE RECORDED IN FORM 2 FOR THE SPECIFIC MONITOR ON THE LOG BOOK.

SECTION I: GROUNDWATER MONITORING AND SAMPLING PROTOCOL

2.0 PURGING PROCEDURE (cont'd)

4. The volume of standing water in each monitor shall be calculated from the highest recorded static level and the total well depth and recorded on FORM 2. This volume will not appreciably change with seasonal fluctuations and may be used as the uniform standard in determining the purged volume during each sampling survey.
5. Conductivity, temperature and pH values shall be recorded after the removal of each casing volume to confirm stabilized quality conditions. When this field-measurement program is initiated, these quality results may be utilized to determine if the purged volume may be reduced to two casing volumes. Field monitoring equipment shall be calibrated each day prior to use, and results noted on FORM 6.

3.0 SAMPLING/SUBMISSION PROCEDURE

1. Suitable sample bottles (containing premeasured preservatives, as required) and QA/QC blanks shall be obtained from the analyzing laboratory in advance of the sampling program. The number and type of field and spiked blanks shall be determined by prior consultation with the laboratory representative.
2. Samples shall be collected the day following the purging exercise (to permit water-level recovery in the slower responding monitors) by means of the dedicated samplers in all monitor wells.
3. Sample collection shall be undertaken in the following sequence, as necessary:
 - Volatile organics
 - Pesticides/herbicides
 - Phenolics
 - Heavy metals
 - General chemistry

SECTION I: GROUNDWATER MONITORING AND SAMPLING PROTOCOL

3.0 SAMPLING/SUBMISSION PROCEDURE (cont'd)

4. Samples collected for heavy-metal determinations (which include iron and manganese) shall be field filtered before placement into sample bottle containing the acid preservative. If appreciable sediment occurs in the sample and filtering cannot be undertaken, a sample shall be collected in a bottle without preservative, and the sediment shall be allowed to settle before a sample is decanted into a bottle without preservative for subsequent filtration and analysis by the laboratory.
5. Sample collected for volatile organics shall completely fill the sample bottle, with no air space permitted.
6. PLACE SAMPLES INTO A COOLER WITH PRE-FROZEN ICE PACKS AND DELIVER TO LABORATORY WITHIN 24 HOURS AFTER COMPLETION OF PROGRAM.
7. Sampling information shall be recorded on FORM 3 of the log book.
8. Each sample bottle shall be labelled to indicate the project name, well designation, time of sample collection, preservatives added and analyses to be performed.
9. If submitted to other than the MOE, a chain of custody form shall be completed and submitted together with the samples to the laboratory.

SECTION II: SURFACE WATER MONITORING AND SAMPLING PROTOCOL

1. Water samples shall be collected upstream, opposite and downstream from the landfill side of the watercourse.
2. Sampling shall be preferably undertaken under baseflow conditions (to observe maximum quality impact). Thus, there shall be several days without precipitation antecedent to the sampling survey.
3. Sampling shall be preferably undertaken when the stream has a discernable flow. Sampling of pondings shall be discouraged unless representative of the local conditions.
4. Samples shall be collected at mid-depth in the stream (to prevent the uptake of bottom sediments) and preferably from the middle of the stream. Remove bottle cap when sampling point reached and point bottle opening opposite direction of flow.
5. Samples shall be directly collected into the sample bottles (with or without preservatives, as required) WITHOUT filtering.
6. Field measurements shall be taken of the temperature, conductivity, and pH at each sampling station when samples are collected for chemical analysis. Additionally, the stream and weather conditions shall be noted and the prevailing flow shall be determined by estimation of the stream depth, width and the current velocity.
7. Pertinent information on the stream conditions shall be recorded for each station during each site visit on FORM 4 of the log book.
8. Any digitally-metered instrument used to obtain field measurements (other than temperature) shall be calibrated before and after the sampling survey to ensure reliable results.

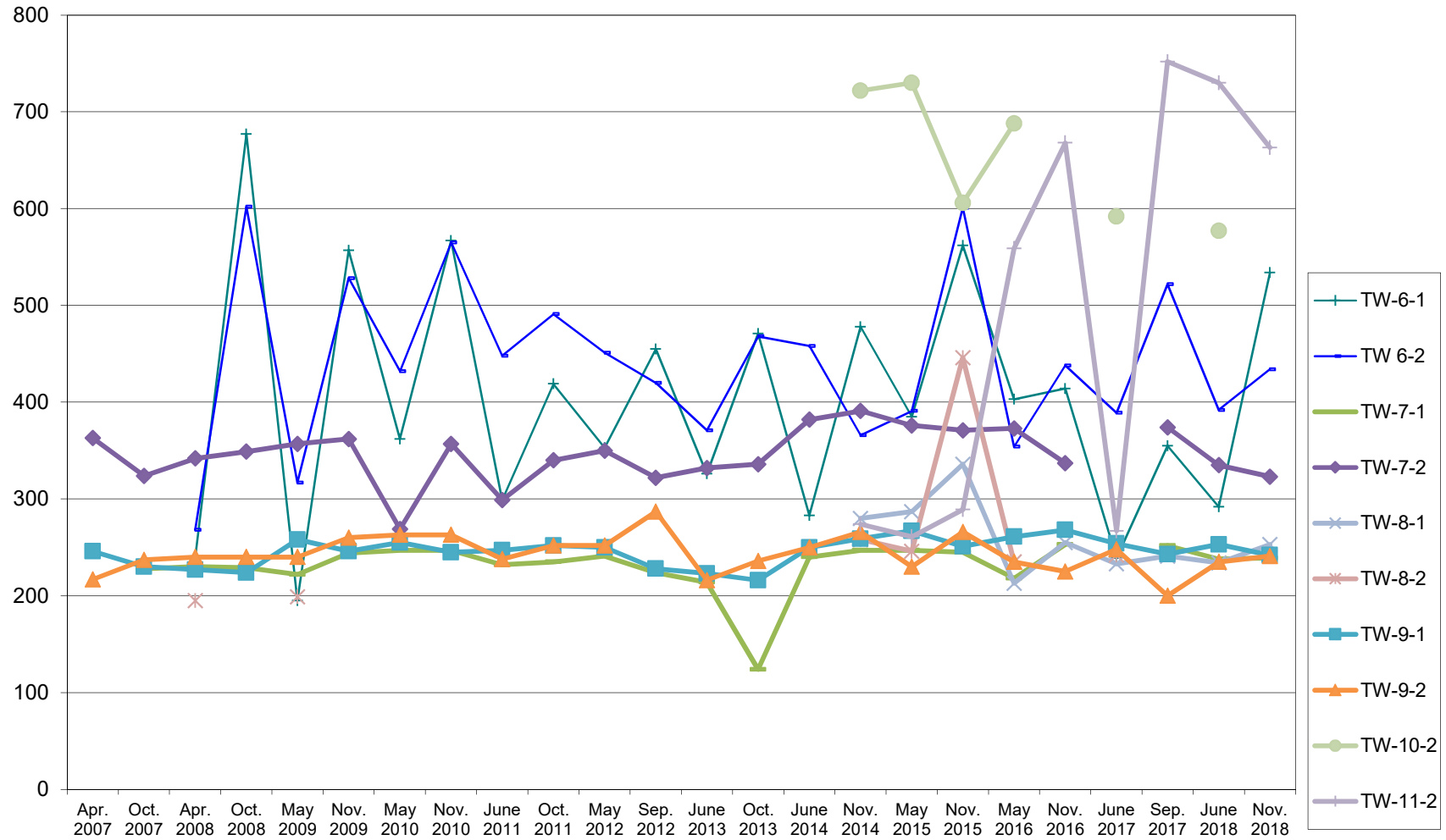
SECTION III: COMBUSTIBLE GAS MONITORING PROTOCOL

1. Prior to the field survey, the combustible gas detector shall be calibrated to ensure acceptable gas measurements.
2. When measuring the gas concentration in any probe, a specific sequence shall be followed:
 - i) Thoroughly purge by aspirating atmospheric air through instrument.
 - ii) Zero high-level (0-100 percent) and low-level (0-5 percent) detection scales.
 - iii) Aspirate gas from probe initially USING THE HIGH SCALE (0-100 percent) until a steady reading is observed on the scale.
 - iv) If a gas concentration below 5 percent is indicated, set to low-level scale (0-5 percent) and aspirate until a steady reading is observed on the scale.
 - v) Conclude test by purging instrument with atmospheric air.
3. Combustible gas presence/absence and concentrations shall be recorded on FORM 5 of the log book.

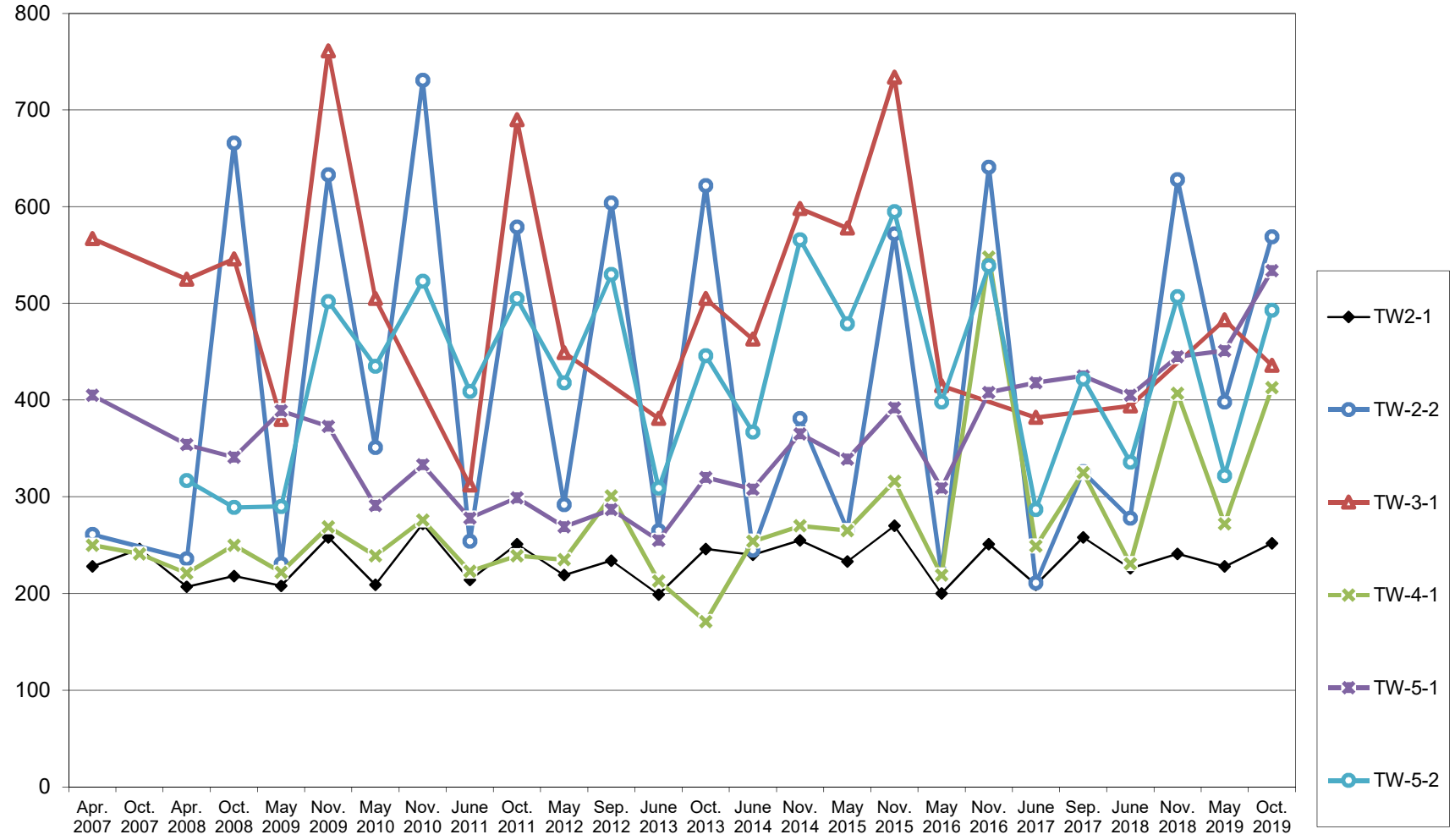
Appendix D

Alkalinity, Iron and Chloride Graphs

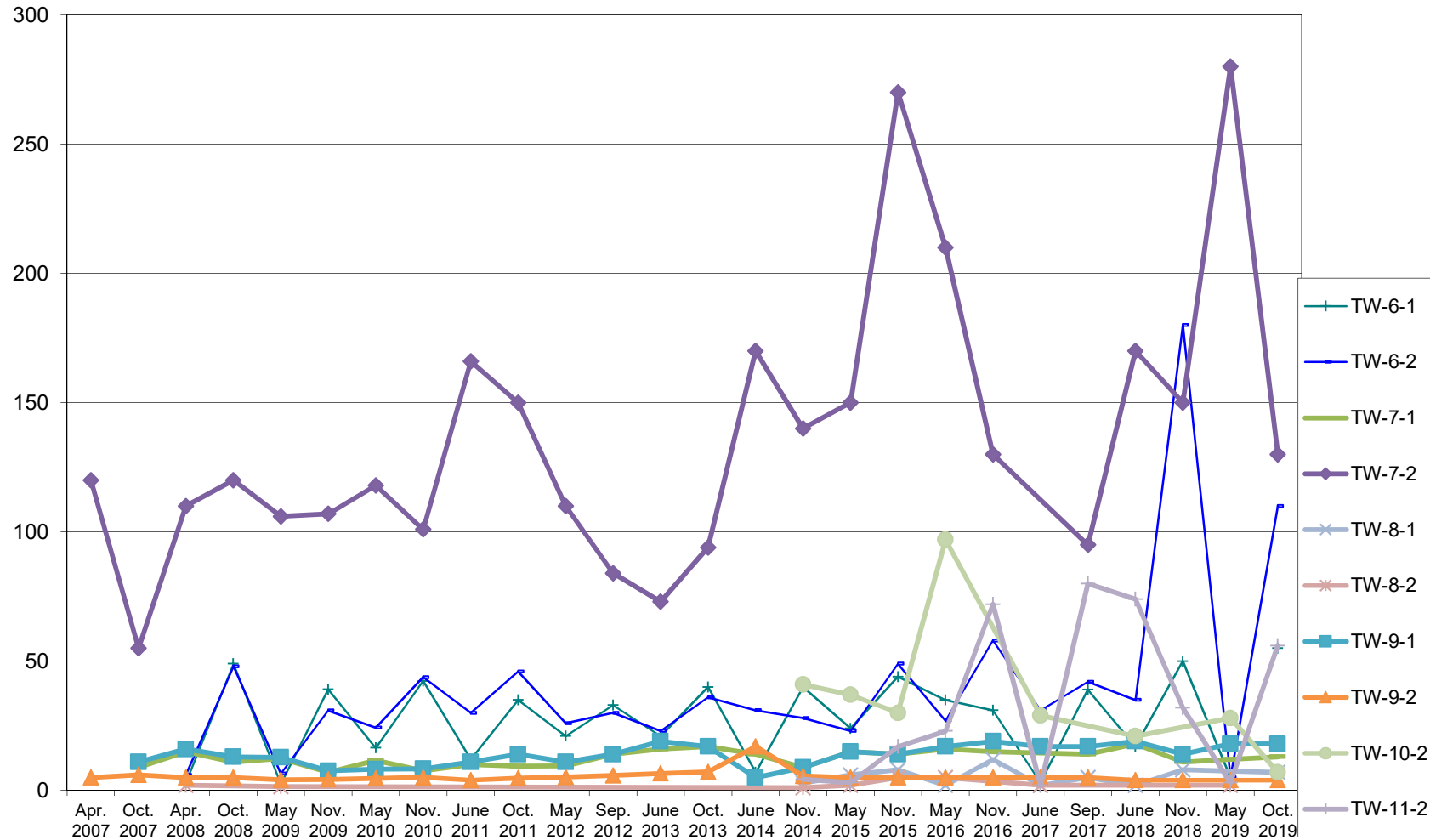
**ALKALINITY LEVELS
STONEY LAKE ROAD LAND FILL SITE
DOWNGRADIENT and BACKGROUND MONITORS**



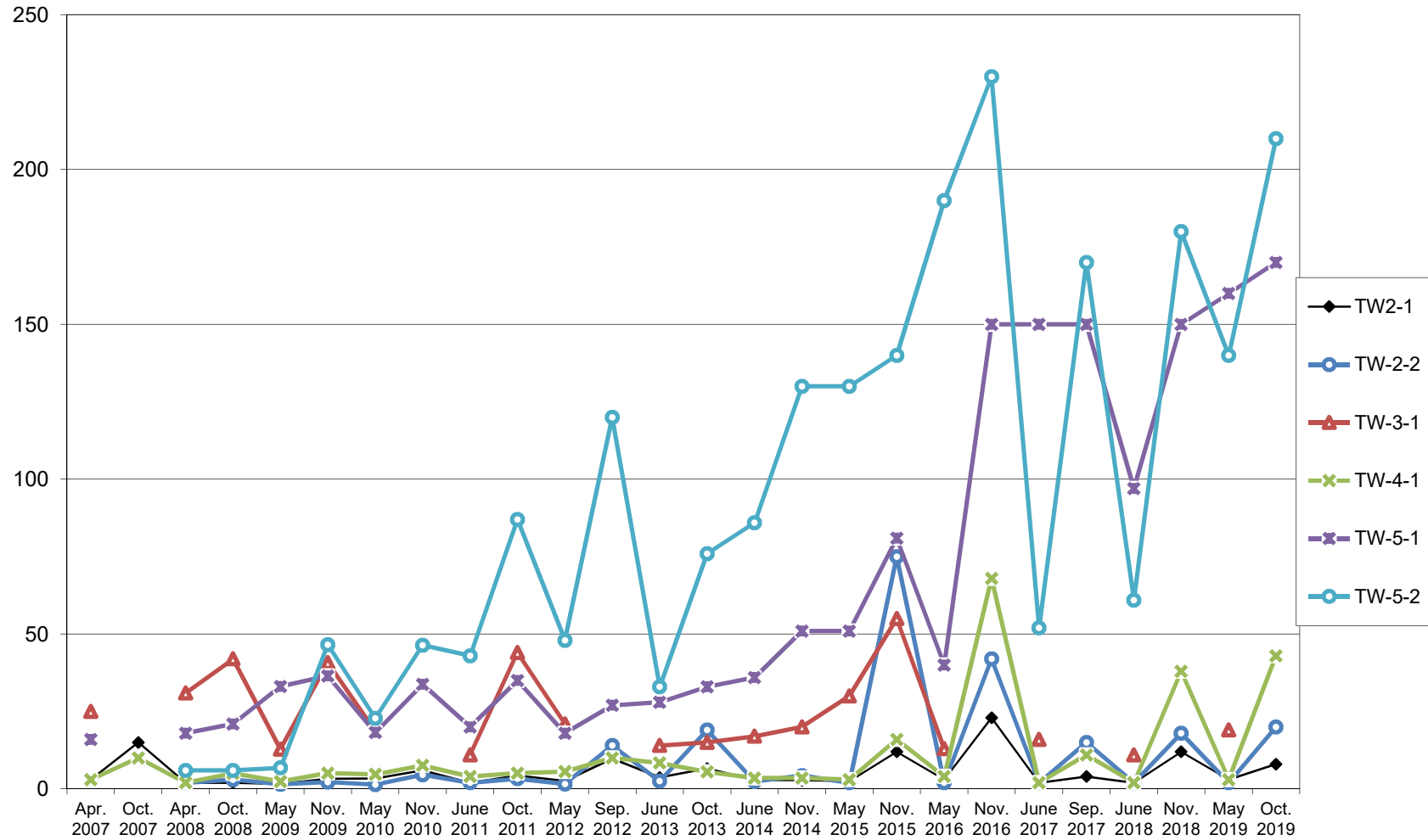
ALKALINITY LEVELS
STONEY LAKE ROAD LAND FILL SITE
REFUSE AREA



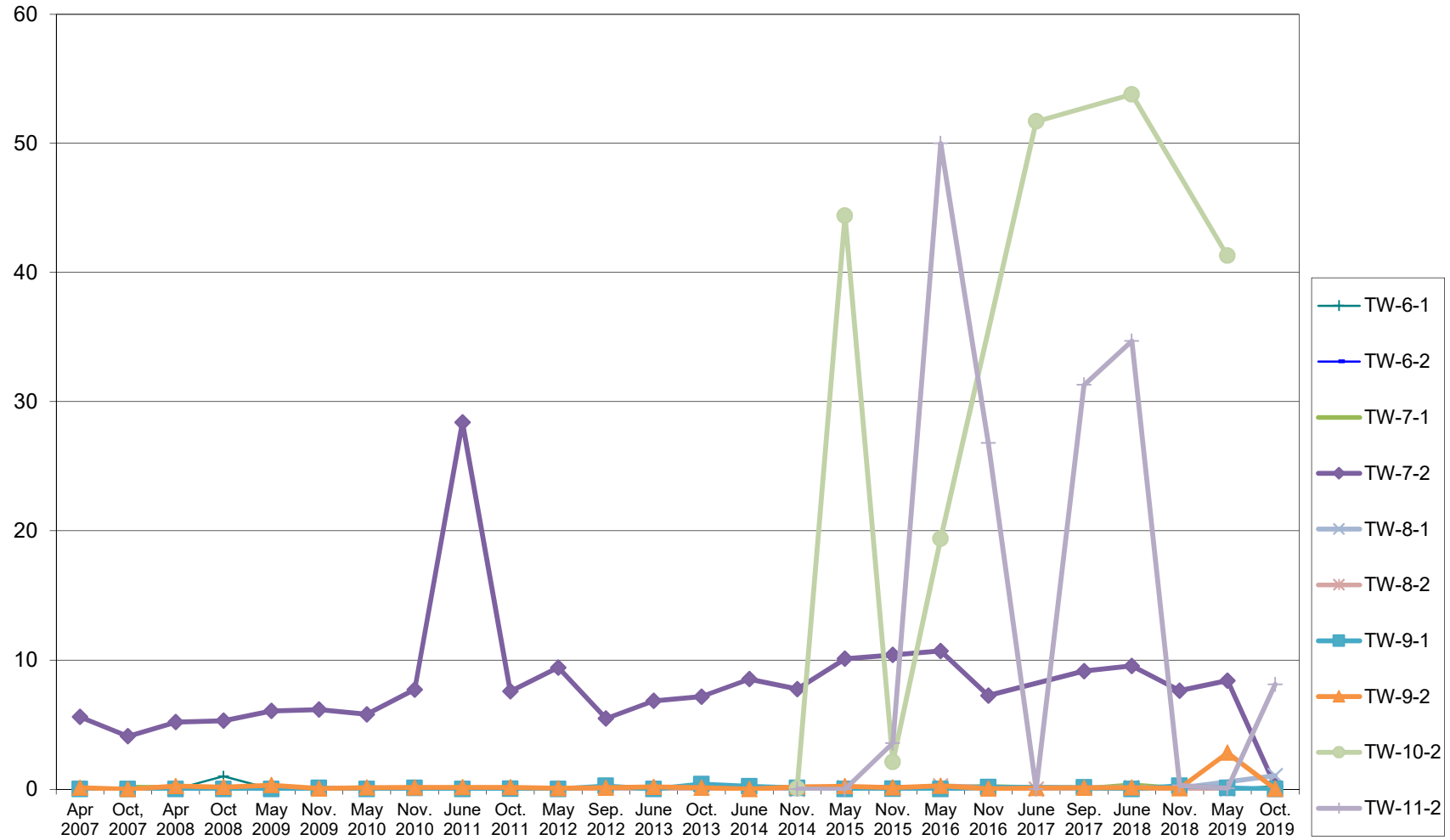
CHLORIDE LEVELS STONEY LAKE LAND FILL SITE DOWNGRADIENT and BACKGROUND MONITORS



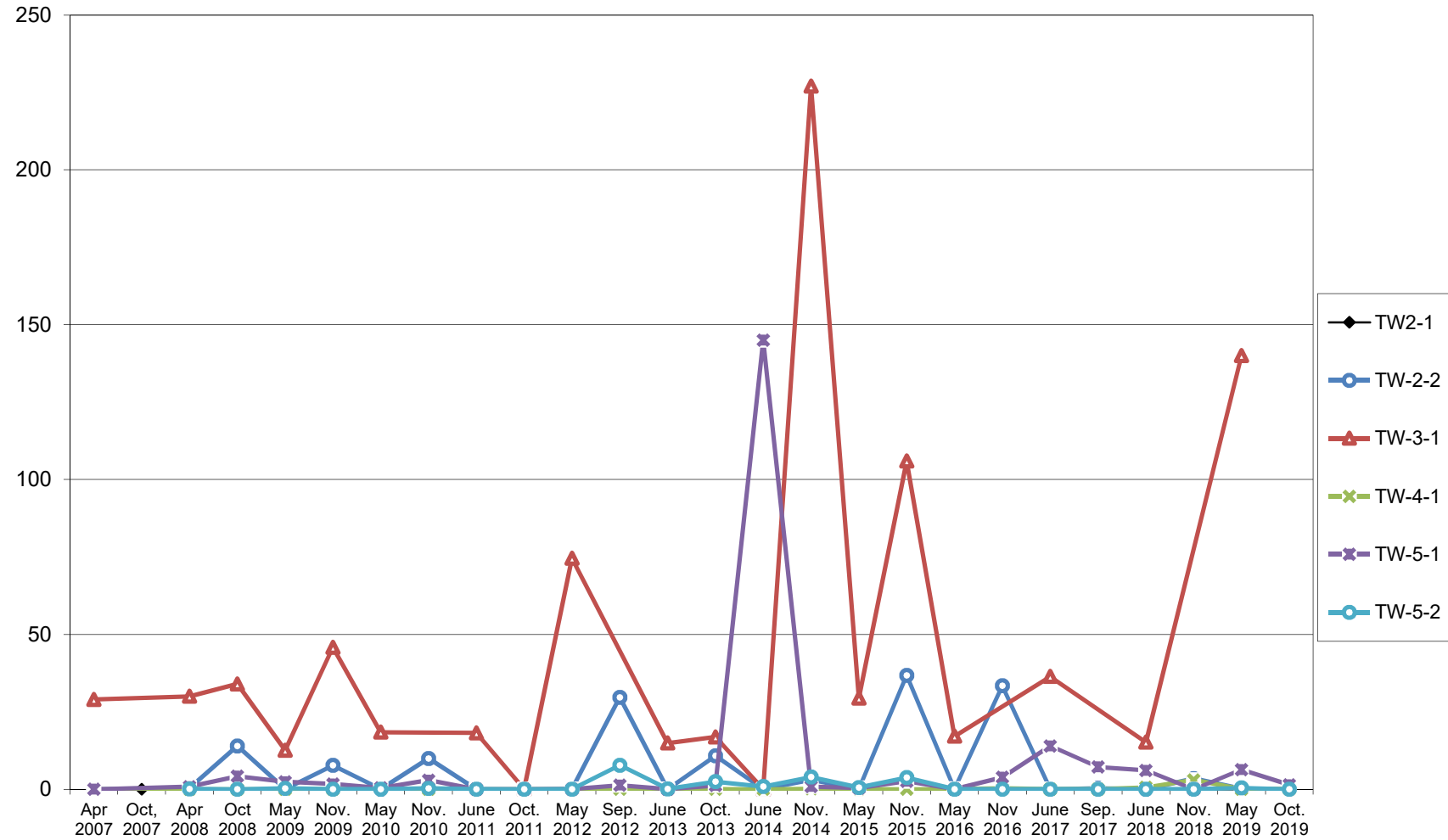
CHLORIDE LEVELS STONEY LAKE LAND FILL SITE REFUSE AREA



**IRON LEVELS
STONEY LAKE LAND FILL SITE
DOWNGRADIENT and BACKGROUND MONITORS**



IRON LEVELS STONEY LAKE LAND FILL SITE LANDFILL MONITORS



Appendix E

2019 Water Quality Data



FINAL REPORT

CA15634-MAY19 R1

PO#:735115229 11193449-01

Prepared for

GHD

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	GHD	Project Specialist	Brad Moore Hon. B.Sc
Address	347 Pido Rd., Unit #29 Peterborough, ON K9J 6Z8. Canada	Laboratory	SGS Canada Inc.
Contact	Gus Bolin	Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-749-3317	Telephone	705-652-2143
Facsimile		Facsimile	705-652-6365
Email	gus.bolin@ghd.com	Email	brad.moore@sgs.com
Project	PO#:735115229 11193449-01	SGS Reference	CA15634-MAY19
Order Number		Received	05/29/2019
Samples	Ground Water (3)	Approved	06/06/2019
		Report Number	CA15634-MAY19 R1
		Date Reported	06/06/2019

COMMENTS

SIGNATORIES

Brad Moore Hon. B.Sc

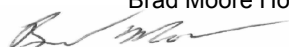




TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-5

QC Summary..... 6-14

Legend..... 15

Annexes..... 16



FINAL REPORT

CA15634-MAY19 R1

Client: GHD

Project: PO#:735115229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Galdi

PACKAGE: - BTEX (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result
BTEX						
Benzene	ug/L	0.5		< 0.5	< 0.5	< 0.5
Toluene	ug/L	0.5		< 0.5	< 0.5	< 0.5

PACKAGE: - General Chemistry (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result
General Chemistry						
Alkalinity	mg/L as CaCO3	2		251	244	399
Conductivity	uS/cm	2		544	528	817
Total Dissolved Solids	mg/L	30		300	283	509
Chemical Oxygen Demand	mg/L	8		< 8	< 8	< 8
Total Kjeldahl Nitrogen	as N mg/L	0.5		< 0.5	< 0.5	0.8
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	< 0.1	0.6
Dissolved Organic Carbon	mg/L	1		1	2	2



FINAL REPORT

CA15634-MAY19 R1

Client: GHD

Project: PO#:735115229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result
Metals and Inorganics					
Phosphorus (total)	mg/L	0.03	< 0.03	< 0.03	< 0.03
Sulphate	mg/L	2	27	18	12
Nitrite (as N)	as N mg/L	0.03	< 0.03	< 0.03	0.16
Nitrate (as N)	as N mg/L	0.06	< 0.06	< 0.06	2.58
Arsenic (dissolved)	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002
Barium (dissolved)	mg/L	0.00002	0.110	0.174	0.117
Boron (dissolved)	mg/L	0.002	0.022	0.024	0.023
Calcium (dissolved)	mg/L	0.01	114	102	115
Cadmium (dissolved)	mg/L	0.000003	< 0.000003	0.000003	0.000016
Chromium (dissolved)	mg/L	0.00008	0.00034	0.00012	0.00011
Copper (dissolved)	mg/L	0.0002	0.0008	0.0018	0.0010
Iron (dissolved)	mg/L	0.007	0.009	0.015	0.012
Potassium (dissolved)	mg/L	0.009	1.24	1.21	2.33
Magnesium (dissolved)	mg/L	0.001	5.29	4.86	3.65
Manganese (dissolved)	mg/L	0.00001	0.00194	0.00239	0.568
Sodium (dissolved)	mg/L	0.01	8.59	8.40	4.20
Phosphorus (dissolved)	mg/L	0.003	< 0.003	< 0.003	< 0.003
Lead (dissolved)	mg/L	0.00001	0.00001	0.00005	0.00002
Zinc (dissolved)	mg/L	0.002	< 0.002	0.005	0.003



FINAL REPORT

CA15634-MAY19 R1

Client: GHD

Project: PO#:735115229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - Other (ORP) (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result
Other (ORP)						
pH	no unit	0.05		7.90	7.85	7.71
Chloride	mg/L	1		18	12	5
Mercury (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01

PACKAGE: - Phenols (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result
Phenols						
4AAP-Phenolics	mg/L	0.002		< 0.002	< 0.002	< 0.002

PACKAGE: - VOCs (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result
VOCs						
1,4-Dichlorobenzene	µg/L	0.5		< 0.5	< 0.5	< 0.5
Dichloromethane	µg/L	0.5		< 0.5	< 0.5	< 0.5
Vinyl Chloride	µg/L	0.2		< 0.2	< 0.2	< 0.2



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-~~ENV~~IEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0001-JUN19	mg/L as CaCO3	2	< 2	7	10	102	80	120	NA		
Alkalinity	EWL0583-MAY19	mg/L as CaCO3	2	< 2	0	10	97	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-~~ENV~~ISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0002-JUN19	as N mg/L	0.1	<0.1	0	10	97	90	110	101	75	125



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0620-MAY19	mg/L	1	<1	2	20	100	80	120	89	75	125
Sulphate	DIO0620-MAY19	mg/L	2	<2	2	20	104	80	120	92	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0026-JUN19	mg/L	0.03	<0.03	ND	20	96	80	120	102	75	125
Nitrate (as N)	DIO0026-JUN19	mg/L	0.06	<0.06	6	20	97	80	120	106	75	125
Nitrite (as N)	DIO0028-JUN19	mg/L	0.03	<0.03	ND	20	94	80	120	95	75	125
Nitrate (as N)	DIO0028-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

Carbon by SFA

Method: SM 5310 | Internal ref.: ME-CA-|ENV|SFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0005-JUN19	mg/L	1	<1	0	20	108	90	110	101	75	125
Dissolved Organic Carbon	SKA0014-JUN19	mg/L	1	<1	3	20	99	90	110	112	75	125

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-|ENV|EWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0588-MAY19	mg/L	8	<8	ND	20	100	80	120	98	75	125



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

Conductivity
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0001-JUN19	uS/cm	2	< 2	2	10	99	90	110	NA		
Conductivity	EWL0583-MAY19	uS/cm	2	2	1	10	97	90	110	NA		

Mercury by CVAAS
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0033-MAY19	ug/L	0.01	<0.01	ND	20	116	80	120	124	70	130



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	5	20	98	90	110	102	70	130
Barium (dissolved)	EMS0218-MAY19	mg/L	0.00002	< 0.00002	1	20	98	90	110	83	70	130
Boron (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	1	20	97	90	110	NV	70	130
Calcium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	1	20	99	90	110	NV	70	130
Cadmium (dissolved)	EMS0218-MAY19	mg/L	0.000003	< 0.000003	ND	20	95	90	110	87	70	130
Chromium (dissolved)	EMS0218-MAY19	mg/L	0.00008	< 0.00008	5	20	99	90	110	98	70	130
Copper (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	ND	20	94	90	110	NV	70	130
Iron (dissolved)	EMS0218-MAY19	mg/L	0.007	< 0.007	0	20	96	90	110	NV	70	130
Potassium (dissolved)	EMS0218-MAY19	mg/L	0.009	< 0.009	1	20	100	90	110	NV	70	130
Magnesium (dissolved)	EMS0218-MAY19	mg/L	0.001	< 0.001	2	20	106	90	110	NV	70	130
Manganese (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	0	20	101	90	110	NV	70	130
Sodium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	ND	20	101	90	110	NV	70	130
Lead (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	4	20	97	90	110	97	70	130
Phosphorus (dissolved)	EMS0218-MAY19	mg/L	0.003	< 0.003	ND	20	97	90	110	NV	70	130
Zinc (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	ND	20	97	90	110	NV	70	130



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

pH
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0001-JUN19	no unit	0.05	NA	0		100			NA		
pH	EWL0583-MAY19	no unit	0.05	NA	0		101			NA		

Phenols by SFA
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0025-JUN19	mg/L	0.002	<0.002	ND	10	94	90	110	90	75	125

Phosphorus by SFA
Method: SM 4500-P J | Internal ref.: ME-CA-IENVISFA-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	SKA0015-JUN19	mg/L	0.03	<0.03	7	10	102	90	110	99	75	125



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

Solids Analysis

Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0010-JUN19	mg/L	30	<30	1	20	100	90	110	NA		
Total Dissolved Solids	EWL0022-JUN19	mg/L	30	<30	0	20	100	90	110	NA		
Total Dissolved Solids	EWL0579-MAY19	mg/L	30	<30	ND	20	98	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0001-JUN19	as N mg/L	0.5	<0.5	ND	10	102	90	110	94	75	125



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,4-Dichlorobenzene	GCM0620-MAY19	ug/L	0.5	<0.5	ND	30	97	60	130	90	50	140
Benzene	GCM0620-MAY19	ug/L	0.5	<0.5	ND	30	96	60	130	91	50	140
Dichloromethane	GCM0620-MAY19	ug/L	0.5	<0.5	ND	30	81	60	130	77	50	140
Toluene	GCM0620-MAY19	ug/L	0.5	<0.5	ND	30	97	60	130	93	50	140
Vinyl Chloride	GCM0620-MAY19	ug/L	0.2	<0.2	ND	30	93	60	130	86	50	140

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

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-- End of Analytical Report --



FINAL REPORT

CA15635-MAY19 R1

PO# 73515229 11193449-01

Prepared for

GHD

First Page

CLIENT DETAILS

Client GHD

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Project PO# 73515229 11193449-01

Order Number

Samples Ground Water (4)

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COMMENTS

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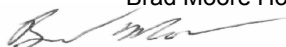




TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-4

QC Summary..... 5-11

Legend..... 12

Annexes..... 13



FINAL REPORT

CA15635-MAY19 R1

Client: GHD

Project: PO# 73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - General Chemistry (WATER)

Sample Number	5	6	7	8
Sample Name	TW-2-1	TW-3-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
General Chemistry						
Alkalinity	mg/L as CaCO ₃	2	228	483	272	451
Conductivity	uS/cm	2	451	822	529	2570
Total Dissolved Solids	mg/L	30	260	389	280	2390
Chemical Oxygen Demand	mg/L	8	< 8	78	< 8	32
Ammonia+Ammonium (N)	as N mg/L	0.1	< 0.1	21.3	< 0.1	0.7
Dissolved Organic Carbon	mg/L	1	1	6	2	12

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8
Sample Name	TW-2-1	TW-3-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
Metals and Inorganics						
Sulphate	mg/L	2	3	9	9	950
Nitrate (as N)	as N mg/L	0.06	0.96	< 0.06	1.87	< 0.06
Arsenic (dissolved)	mg/L	0.0002	< 0.0002	0.0130	< 0.0002	0.0004
Barium (dissolved)	mg/L	0.00002	0.0192	0.639	0.0190	0.0273
Boron (dissolved)	mg/L	0.002	0.007	0.266	0.012	1.49
Calcium (dissolved)	mg/L	0.01	102	135	120	475
Cadmium (dissolved)	mg/L	0.000003	0.000004	0.000009	< 0.000003	< 0.000003
Chromium (dissolved)	mg/L	0.00008	0.00016	0.00371	0.00014	0.00025
Copper (dissolved)	mg/L	0.0002	0.0007	0.0009	0.0009	0.0023



FINAL REPORT

CA15635-MAY19 R1

Client: GHD

Project: PO# 73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8
Sample Name	TW-2-1	TW-3-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
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Metals and Inorganics (continued)

Iron (dissolved)	mg/L	0.007	0.007	140	0.042	6.36
Potassium (dissolved)	mg/L	0.009	0.671	13.9	0.820	4.92
Magnesium (dissolved)	mg/L	0.001	2.06	10.0	1.88	48.0
Manganese (dissolved)	mg/L	0.00001	0.00011	0.646	0.00053	0.852
Sodium (dissolved)	mg/L	0.01	2.19	18.6	2.75	82.9
Lead (dissolved)	mg/L	0.00001	0.00001	0.00049	0.00002	0.00002
Zinc (dissolved)	mg/L	0.002	0.002	0.006	0.003	0.003

PACKAGE: - Other (ORP) (WATER)

Sample Number	5	6	7	8
Sample Name	TW-2-1	TW-3-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
-----------	-------	----	--------	--------	--------	--------

Other (ORP)

pH	no unit	0.05	8.12	7.11	8.01	7.08
Chloride	mg/L	1	3	19	3	160
Mercury (total)	µg/L	0.01	< 0.01	0.01	< 0.01	< 0.01



FINAL REPORT

CA15635-MAY19 R1

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0001-JUN19	mg/L as CaCO3	2	< 2	7	10	102	80	120	NA		
Alkalinity	EWL0576-MAY19	mg/L as CaCO3	2	< 2	1	10	101	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0016-JUN19	as N mg/L	0.1	<0.1	1	10	99	90	110	98	75	125
Ammonia+Ammonium (N)	SKA0239-MAY19	as N mg/L	0.1	<0.1	ND	10	101	90	110	107	75	125



FINAL REPORT

CA15635-MAY19 R1

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0620-MAY19	mg/L	1	<1	2	20	100	80	120	89	75	125
Sulphate	DIO0620-MAY19	mg/L	2	<2	2	20	104	80	120	92	75	125
Sulphate	DIO0625-MAY19	mg/L	2	<2	ND	20	103	80	120	97	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate (as N)	DIO0026-JUN19	mg/L	0.06	<0.06	6	20	97	80	120	106	75	125
Nitrate (as N)	DIO0028-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125



FINAL REPORT

CA15635-MAY19 R1

QC SUMMARY

Carbon by SFA

Method: SM 5310 | Internal ref.: ME-CA-IENVISFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0005-JUN19	mg/L	1	<1	0	20	108	90	110	101	75	125

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0588-MAY19	mg/L	8	<8	ND	20	100	80	120	98	75	125
Chemical Oxygen Demand	EWL0589-MAY19	mg/L	8	<8	6	20	100	80	120	99	75	125



FINAL REPORT

CA15635-MAY19 R1

QC SUMMARY

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0001-JUN19	uS/cm	2	< 2	2	10	99	90	110	NA		
Conductivity	EWL0576-MAY19	uS/cm	2	2	1	10	101	90	110	NA		

Mercury by CVAAS

Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0004-JUN19	ug/L	0.01	<0.01	ND	20	100	80	120	128	70	130



FINAL REPORT

CA15635-MAY19 R1

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-1ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	5	20	98	90	110	102	70	130
Barium (dissolved)	EMS0218-MAY19	mg/L	0.00002	< 0.00002	1	20	98	90	110	83	70	130
Boron (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	1	20	97	90	110	NV	70	130
Calcium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	1	20	99	90	110	NV	70	130
Cadmium (dissolved)	EMS0218-MAY19	mg/L	0.000003	< 0.000003	ND	20	95	90	110	87	70	130
Chromium (dissolved)	EMS0218-MAY19	mg/L	0.00008	< 0.00008	5	20	99	90	110	98	70	130
Copper (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	ND	20	94	90	110	NV	70	130
Iron (dissolved)	EMS0218-MAY19	mg/L	0.007	< 0.007	0	20	96	90	110	NV	70	130
Potassium (dissolved)	EMS0218-MAY19	mg/L	0.009	< 0.009	1	20	100	90	110	NV	70	130
Magnesium (dissolved)	EMS0218-MAY19	mg/L	0.001	< 0.001	2	20	106	90	110	NV	70	130
Manganese (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	0	20	101	90	110	NV	70	130
Sodium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	ND	20	101	90	110	NV	70	130
Lead (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	4	20	97	90	110	97	70	130
Zinc (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	ND	20	97	90	110	NV	70	130



FINAL REPORT

CA15635-MAY19 R1

QC SUMMARY

pH
Method: SM 4500 | Internal ref.: ME-CA-~~I~~ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0001-JUN19	no unit	0.05	NA	0		100			NA		
pH	EWL0576-MAY19	no unit	0.05	NA	0		100			NA		

Solids Analysis
Method: SM 2540C | Internal ref.: ME-CA-~~I~~ENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0022-JUN19	mg/L	30	<30	0	20	100	90	110	NA		
Total Dissolved Solids	EWL0579-MAY19	mg/L	30	<30	ND	20	98	90	110	NA		

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

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-- End of Analytical Report --



FINAL REPORT

CA15633-MAY19 R

PO#:73515229 11193449-01

Prepared for

GHD

First Page

CLIENT DETAILS

Client **GHD**

Address **347 Pido Rd., Unit #29
Peterborough, ON
K9J 6Z8. Canada**

Contact **Gus Bolin**

Telephone **705-749-3317**

Facsimile

Email **gus.bolin@ghd.com**

Project **PO#:73515229 11193449-01**

Order Number

Samples **Ground Water (8)**

LABORATORY DETAILS

Project Specialist **Brad Moore Hon. B.Sc**

Laboratory **SGS Canada Inc.**

Address **185 Concession St., Lakefield ON, K0L 2H0**

Telephone **705-652-2143**

Facsimile **705-652-6365**

Email **brad.moore@sgs.com**

SGS Reference **CA15633-MAY19**

Received **05/29/2019**

Approved **06/11/2019**

Report Number **CA15633-MAY19 R**

Date Reported **06/11/2019**

COMMENTS

Bromomethane LCS; Recovery is outside control limits; the overall quality control for this analysis has been assessed and meets method acceptability criteria.

SIGNATORIES

Brad Moore Hon. B.Sc

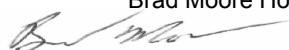




TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-7

QC Summary..... 8-18

Legend..... 19

Annexes..... 20



FINAL REPORT

CA15633-MAY19 R

Client: GHD

Project: PO#:73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Galdi

PACKAGE: - BTEX (WATER)

Sample Number	10	12
Sample Name	TW-6-2	TW-2-2
Sample Matrix	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result
BTEX				
Benzene	ug/L	0.5	< 0.5	< 0.5
Ethylbenzene	ug/L	0.5	< 0.5	< 0.5
Toluene	ug/L	0.5	< 0.5	< 0.5
Xylene (total)	ug/L	0.5	< 0.5	< 0.5
o-xylene	ug/L	0.5	< 0.5	< 0.5
m/p-xylene	ug/L	0.5	< 0.5	< 0.5

PACKAGE: - General Chemistry (WATER)

Sample Number	5	6	7	8	9	10	11	12
Sample Name	TW-11-2	TW-10-2	TW-9-2	TW-8-2	TW-7-2	TW-6-2	TW-5-2	TW-2-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result	Result	Result
General Chemistry										
Biochemical Oxygen Demand (BOD5)	mg/L	2	< 4 †	< 4 †	4	< 4 †	< 4 †	< 4 †	< 4 †	< 4 †
Total Suspended Solids	mg/L	2	437	355	2210	35	224	7	86	32
Alkalinity	mg/L as CaCO3	2	303	628	340	229	382	276	322	398
Conductivity	uS/cm	2	516	1170	448	422	2140	572	2070	882
Total Dissolved Solids	mg/L	30	311	606	274	234	1590	489	1900	251
Chemical Oxygen Demand	mg/L	8	< 8	35	< 8	< 8	11	< 8	16	< 8
Total Kjeldahl Nitrogen	as N mg/L	0.5	0.6	26.7	< 0.5	< 0.5	< 0.5	0.6	< 0.5	< 0.5
Ammonia+Ammonium (N)	as N mg/L	0.1	< 0.1	27.6	0.2	< 0.1	0.2	0.4	< 0.1	< 0.1



FINAL REPORT

CA15633-MAY19 R

Client: GHD

Project: PO#:73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8	9	10	11	12
Sample Name	TW-11-2	TW-10-2	TW-9-2	TW-8-2	TW-7-2	TW-6-2	TW-5-2	TW-2-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result	Result	Result
Metals and Inorganics										
Phosphorus (total)	mg/L	0.03	0.36	0.13	0.73	< 0.03	0.22	< 0.03	0.03	< 0.03
Sulphate	mg/L	2	9	8	15	8	520	23	880	6
Nitrite (as N)	as N mg/L	0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06	2.14	< 0.06	0.20	0.61	< 0.06	1.98	2.62	0.36
Arsenic (dissolved)	mg/L	0.0002	< 0.0002	0.0016	0.0004	< 0.0002	0.0012	< 0.0002	0.0003	< 0.0002
Barium (dissolved)	mg/L	0.00002	0.0283	0.398	0.487	0.0293	0.128	0.114	0.0254	0.0287
Boron (dissolved)	mg/L	0.002	0.047	0.431	0.026	0.013	1.25	0.080	49.6	0.160
Calcium (dissolved)	mg/L	0.01	118	197	281	98.3	339	112	351	107
Cadmium (dissolved)	mg/L	0.000003	< 0.000003	0.000010	0.000064	< 0.000003	0.000004	0.000007	0.000006	< 0.000003
Chromium (dissolved)	mg/L	0.00008	0.00016	0.00092	0.00401	0.00020	0.00014	0.00012	0.00031	0.00013
Copper (dissolved)	mg/L	0.0002	0.0010	0.0020	0.0081	0.0007	0.0012	0.0009	0.0051	0.0007
Iron (dissolved)	mg/L	0.007	0.067	41.3	2.82	0.020	8.41	0.011	0.440	0.106
Potassium (dissolved)	mg/L	0.009	0.814	19.7	1.10	0.444	2.46	2.32	1.55	0.780
Magnesium (dissolved)	mg/L	0.001	1.87	15.8	8.30	2.82	41.0	5.33	113	3.19
Manganese (dissolved)	mg/L	0.00001	0.00169	2.49	0.273	0.00091	2.47	0.463	0.0442	0.0264
Sodium (dissolved)	mg/L	0.01	2.61	28.2	3.00	2.86	127	7.51	108	2.34
Lead (dissolved)	mg/L	0.00001	0.00003	0.00129	0.00249	0.00002	0.00001	0.00001	0.00015	0.00001
Zinc (dissolved)	mg/L	0.002	0.004	0.019	0.017	0.003	0.004	< 0.002	0.004	0.002



FINAL REPORT

CA15633-MAY19 R

Client: GHD

Project: PO#:73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - Other (ORP) (WATER)

Sample Number	5	6	7	8	9	10	11	12
Sample Name	TW-11-2	TW-10-2	TW-9-2	TW-8-2	TW-7-2	TW-6-2	TW-5-2	TW-2-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result	Result	Result	Result	Result
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Other (ORP)

pH	no unit	0.05		7.50	7.49	7.96	8.18	7.07	8.04	7.33	7.47
Chloride	mg/L	1		3	28	4	2	280	5	140	2
Mercury (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

PACKAGE: - Phenols (WATER)

Sample Number	5	6	7	8	9	10	11	12
Sample Name	TW-11-2	TW-10-2	TW-9-2	TW-8-2	TW-7-2	TW-6-2	TW-5-2	TW-2-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result	Result	Result	Result	Result
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Phenols

4AAP-Phenolics	mg/L	0.001		0.002	0.004	< 0.001	< 0.001	0.007	< 0.001	0.003	0.001
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PACKAGE: - THMs (VOC) (WATER)

Sample Number	10	12
Sample Name	TW-6-2	TW-2-2
Sample Matrix	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result
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THMs (VOC)

Bromodichloromethane	µg/L	0.5		< 0.5	< 0.5
Bromoform	µg/L	0.5		< 0.5	< 0.5
Dibromochloromethane	µg/L	0.5		< 0.5	< 0.5



FINAL REPORT

CA15633-MAY19 R

Client: GHD

Project: PO#:73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - VOCs (WATER)

Sample Number	10	12
Sample Name	TW-6-2	TW-2-2
Sample Matrix	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result
VOCs				
Bromomethane	µg/L	0.5	< 0.5	< 0.5
Carbon tetrachloride	µg/L	0.2	< 0.2	< 0.2
Chloroethane	µg/L	5.0	< 5	< 5
Chloroform	µg/L	0.5	< 0.5	< 0.5
Chloromethane	µg/L	5.0	< 5	< 5
1,2-Dichlorobenzene	µg/L	0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	< 0.5	< 0.5
1,1-Dichloroethane	µg/L	0.5	< 0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	< 0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	< 0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	< 0.5	< 0.5
cis-1,2-Dichloroethene	µg/L	0.5	< 0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5	< 0.5	< 0.5
Ethylenedibromide	µg/L	0.2	< 0.2	< 0.2
Dichloromethane	µg/L	0.5	< 0.5	< 0.5
Monochlorobenzene	µg/L	0.5	< 0.5	< 0.5
Styrene	µg/L	0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	< 0.5	< 0.5
Tetrachloroethene	µg/L	0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	< 0.5	< 0.5



FINAL REPORT

CA15633-MAY19 R

Client: GHD

Project: PO#:73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - VOCs (WATER)

Sample Number	10	12
Sample Name	TW-6-2	TW-2-2
Sample Matrix	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result
VOCs (continued)					
Vinyl Chloride	µg/L	0.2		< 0.2	< 0.2
Trichlorofluoromethane	µg/L	5.0		< 5	< 5
1,1,1-Trichloroethane	µg/L	0.5		< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5		< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5		< 0.5	< 0.5



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0576-MAY19	mg/L as CaCO3	2	< 2	1	10	101	80	120	NA		
Alkalinity	EWL0583-MAY19	mg/L as CaCO3	2	< 2	0	10	97	80	120	NA		
Alkalinity	EWL0600-MAY19	mg/L as CaCO3	2	< 2	5	10	104	80	120	NA		
Alkalinity	EWL0601-MAY19	mg/L as CaCO3	2	< 2	1	10	102	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0002-JUN19	as N mg/L	0.1	<0.1	0	10	97	90	110	101	75	125
Ammonia+Ammonium (N)	SKA0016-JUN19	as N mg/L	0.1	<0.1	1	10	99	90	110	98	75	125



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 375.4 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO0041-JUN19	mg/L	2	<2	2	20	103	80	120	101	75	125
Chloride	DIO0625-MAY19	mg/L	1	<1	3	20	100	80	120	102	75	125
Sulphate	DIO0625-MAY19	mg/L	2	<2	ND	20	103	80	120	97	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0028-JUN19	mg/L	0.03	<0.03	ND	20	94	80	120	95	75	125
Nitrate (as N)	DIO0028-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125
Nitrite (as N)	DIO0032-JUN19	mg/L	0.03	<0.03	3	20	94	80	120	97	75	125
Nitrate (as N)	DIO0032-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125
Nitrite (as N)	DIO0033-JUN19	mg/L	0.03	<0.03	ND	20	95	80	120	100	75	125
Nitrate (as N)	DIO0033-JUN19	mg/L	0.06	<0.06	1	20	99	80	120	107	75	125



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0059-MAY19	mg/L	2	< 2	12	30	99	70	130	96	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0588-MAY19	mg/L	8	<8	ND	20	100	80	120	98	75	125



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Conductivity
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0576-MAY19	uS/cm	2	2	1	10	101	90	110	NA		
Conductivity	EWL0583-MAY19	uS/cm	2	2	1	10	97	90	110	NA		
Conductivity	EWL0601-MAY19	uS/cm	2	< 2	0	10	100	90	110	NA		

Mercury by CVAAS
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0033-MAY19	ug/L	0.01	<0.01	ND	20	116	80	120	124	70	130



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Boron (dissolved)	EMS0018-JUN19	mg/L	0.002	< 0.002	3	20	97	90	110	NV	70	130
Arsenic (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	5	20	98	90	110	102	70	130
Barium (dissolved)	EMS0218-MAY19	mg/L	0.00002	< 0.00002	1	20	98	90	110	83	70	130
Boron (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	1	20	97	90	110	NV	70	130
Calcium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	1	20	99	90	110	NV	70	130
Cadmium (dissolved)	EMS0218-MAY19	mg/L	0.000003	< 0.000003	ND	20	95	90	110	87	70	130
Chromium (dissolved)	EMS0218-MAY19	mg/L	0.00008	< 0.00008	5	20	99	90	110	98	70	130
Copper (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	ND	20	94	90	110	NV	70	130
Iron (dissolved)	EMS0218-MAY19	mg/L	0.007	< 0.007	0	20	96	90	110	NV	70	130
Potassium (dissolved)	EMS0218-MAY19	mg/L	0.009	< 0.009	1	20	100	90	110	NV	70	130
Magnesium (dissolved)	EMS0218-MAY19	mg/L	0.001	< 0.001	2	20	106	90	110	NV	70	130
Manganese (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	0	20	101	90	110	NV	70	130
Sodium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	ND	20	101	90	110	NV	70	130
Lead (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	4	20	97	90	110	97	70	130
Zinc (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	ND	20	97	90	110	NV	70	130



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

pH
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0576-MAY19	no unit	0.05	NA	0		100			NA		
pH	EWL0583-MAY19	no unit	0.05	NA	0		101			NA		
pH	EWL0601-MAY19	no unit	0.05	NA	0		101			NA		

Phenols by SFA
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0025-JUN19	mg/L	0.001	<0.001	ND	10	94	90	110	90	75	125
4AAP-Phenolics	SKA0034-JUN19	mg/L	0.001	<0.001	ND	10	100	90	110	103	75	125



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Phosphorus by SFA
Method: SM 4500-P J | Internal ref.: ME-CA-IENVISFA-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	SKA0015-JUN19	mg/L	0.03	<0.03	7	10	102	90	110	99	75	125

Solids Analysis
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0010-JUN19	mg/L	30	<30	1	20	100	90	110	NA		
Total Dissolved Solids	EWL0023-JUN19	mg/L	30	<30	1	20	99	90	110	NA		
Total Dissolved Solids	EWL0558-MAY19	mg/L	30	<30	3	20	93	90	110	NA		
Total Dissolved Solids	EWL0568-MAY19	mg/L	30	<30	5	20	94	90	110	NA		
Total Dissolved Solids	EWL0579-MAY19	mg/L	30	<30	ND	20	98	90	110	NA		
Total Dissolved Solids	EWL0594-MAY19	mg/L	30	<30	3	20	91	90	110	NA		



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0014-JUN19	mg/L	2	< 2	4	10	NV	90	110	NA		
Total Suspended Solids	EWL0016-JUN19	mg/L	2	< 2	4	10	NV	90	110	NA		
Total Suspended Solids	EWL0026-JUN19	mg/L	2	< 2	4	10	NV	90	110	NA		
Total Suspended Solids	EWL0587-MAY19	mg/L	2	< 2	2	10	NV	90	110	NA		
Total Suspended Solids	EWL0590-MAY19	mg/L	2	< 2	0	10	NV	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0001-JUN19	as N mg/L	0.5	<0.5	ND	10	102	90	110	94	75	125
Total Kjeldahl Nitrogen	SKA0013-JUN19	as N mg/L	0.5	<0.5	ND	10	100	90	110	116	75	125



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	91	50	140
1,1,1-Trichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	97	60	130	74	50	140
1,1,2,2-Tetrachloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	104	60	130	104	50	140
1,1,2-Trichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	119	50	140
1,1-Dichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	93	60	130	73	50	140
1,1-Dichloroethylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	82	60	130	58	50	140
1,2-Dichlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	101	60	130	72	50	140
1,2-Dichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	95	60	130	87	50	140
1,2-Dichloropropane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	91	60	130	84	50	140
1,3-Dichlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	85	50	140
1,4-Dichlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	86	50	140
Benzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	90	50	140
Bromodichloromethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	91	50	140
Bromoform	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	101	60	130	90	50	140
Bromomethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	159	50	140	109	50	140
Carbon tetrachloride	GCM0613-MAY19	ug/L	0.2	<0.2	ND	30	99	60	130	82	50	140
Chloroethane	GCM0613-MAY19	ug/L	5.0	<5	ND	30	93	60	130	82	50	140
Chloroform	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	103	60	130	75	50	140
Chloromethane	GCM0613-MAY19	ug/L	5.0	<5	ND	30	99	60	130	76	50	140
cis-1,2-Dichloroethene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	80	50	140



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5030B/8260C | Internal ref.: ME-CA-ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
cis-1,3-Dichloropropene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	73	50	140
Dibromochloromethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	124	50	140
Dichloromethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	96	60	130	77	50	140
Ethylbenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	105	60	130	95	50	140
Ethylenedibromide	GCM0613-MAY19	ug/L	0.2	<0.2	ND	30	97	60	130	125	50	140
m/p-xylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	105	60	130	94	50	140
Monochlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	93	50	140
o-xylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	108	60	130	98	50	140
Styrene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	108	60	130	70	50	140
Tetrachloroethene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	100	60	130	110	50	140
Toluene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	92	50	140
trans-1,2-Dichloroethene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	93	60	130	71	50	140
trans-1,3-Dichloropropene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	104	60	130	76	50	140
Trichloroethylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	95	60	130	88	50	140
Trichlorofluoromethane	GCM0613-MAY19	ug/L	5.0	<5	ND	30	100	50	140	85	50	140
Vinyl Chloride	GCM0613-MAY19	ug/L	0.2	<0.2	ND	30	102	60	130	79	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

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-- End of Analytical Report --



FINAL REPORT

CA15636-MAY19 R

PO#73515229 11193449-01

Prepared for

GHD

First Page

CLIENT DETAILS

Client **GHD**

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Facsimile

Email **gus.bolin@ghd.com**

Project **PO#73515229 11193449-01**

Order Number

Samples **Surface Water (4)**

LABORATORY DETAILS

Project Specialist **Brad Moore Hon. B.Sc**

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SGS Reference **CA15636-MAY19**

Received **05/29/2019**

Approved **06/10/2019**

Report Number **CA15636-MAY19 R**

Date Reported **06/10/2019**

COMMENTS

SIGNATORIES

Brad Moore Hon. B.Sc

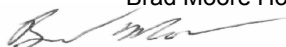




TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-5

QC Summary..... 6-14

Legend..... 15

Annexes..... 16



FINAL REPORT

CA15636-MAY19 R

Client: GHD

Project: PO#73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - General Chemistry (WATER)

Sample Number	5	6	7	8
Sample Name	SW-1	SW-3	SW-6	SW-8
Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
General Chemistry						
Biochemical Oxygen Demand (BOD5)	mg/L	2	< 4 ↑	< 4 ↑	< 4 ↑	< 4 ↑
Total Suspended Solids	mg/L	2	14	2	3	8
Alkalinity	mg/L as CaCO3	2	204	251	417	195
Conductivity	uS/cm	2	407	724	860	558
Total Dissolved Solids	mg/L	30	206	426	491	303
Chemical Oxygen Demand	mg/L	8	19	14	17	19
Total Kjeldahl Nitrogen	as N mg/L	0.5	< 0.5	< 0.5	2.4	0.7
Ammonia+Ammonium (N)	as N mg/L	0.1	< 0.1	< 0.1	1.6	< 0.1

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8
Sample Name	SW-1	SW-3	SW-6	SW-8
Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
Metals and Inorganics						
Sulphate	mg/L	2	6	53	41	< 2
Nitrite (as N)	as N mg/L	0.03	< 0.03	< 0.03	0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06	< 0.06	< 0.06	0.52	< 0.06
Arsenic (total)	mg/L	0.0002	0.0002	0.0002	0.0004	0.0002
Barium (total)	mg/L	0.00002	0.0608	0.0577	0.110	0.0513
Boron (total)	mg/L	0.002	0.016	0.126	0.189	0.011
Calcium (total)	mg/L	0.01	70.8	113	164	74.8



FINAL REPORT

CA15636-MAY19 R

Client: GHD

Project: PO#73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Galdi

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8
Sample Name	SW-1	SW-3	SW-6	SW-8
Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
Metals and Inorganics (continued)						
Cadmium (total)	mg/L	0.000003	< 0.000003	0.000003	0.000005	0.000006
Chromium (total)	mg/L	0.00008	0.00011	0.00024	0.00071	0.00015
Copper (total)	mg/L	0.0002	< 0.0002	0.0008	0.0008	< 0.0002
Iron (total)	mg/L	0.007	0.071	0.064	1.05	0.067
Potassium (total)	mg/L	0.009	0.581	1.68	10.4	1.30
Magnesium (total)	mg/L	0.001	1.96	6.71	11.6	1.81
Manganese (total)	mg/L	0.00001	0.0193	0.00770	1.35	0.0211
Sodium (total)	mg/L	0.01	6.56	28.4	21.2	35.3
Phosphorus (total)	mg/L	0.003	< 0.003	0.137	0.036	0.028
Lead (total)	mg/L	0.00001	< 0.00001	< 0.00001	0.00016	0.00008
Zinc (total)	mg/L	0.002	0.002	0.004	0.005	0.003



FINAL REPORT

CA15636-MAY19 R

Client: GHD

Project: PO#73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - Other (ORP) (WATER)

Sample Number	5	6	7	8
Sample Name	SW-1	SW-3	SW-6	SW-8
Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result	Result
Other (ORP)							
pH	no unit	0.05		8.17	8.17	7.69	7.71
Chloride	mg/L	1		12	62	19	63
Mercury (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01

PACKAGE: - Phenols (WATER)

Sample Number	5	6	7	8
Sample Name	SW-1	SW-3	SW-6	SW-8
Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result	Result
Phenols							
4AAP-Phenolics	mg/L	0.001		0.003	0.004	0.003	0.004



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0059-JUN19	mg/L as CaCO3	2	< 2	2	10	94	80	120	NA		
Alkalinity	EWL0069-JUN19	mg/L as CaCO3	2	< 2	0	10	102	80	120	NA		
Alkalinity	EWL0576-MAY19	mg/L as CaCO3	2	< 2	1	10	101	80	120	NA		
Alkalinity	EWL0601-MAY19	mg/L as CaCO3	2	< 2	1	10	102	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0002-JUN19	as N mg/L	0.1	<0.1	0	10	97	90	110	101	75	125



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0620-MAY19	mg/L	1	<1	2	20	100	80	120	89	75	125
Sulphate	DIO0620-MAY19	mg/L	2	<2	2	20	104	80	120	92	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0028-JUN19	mg/L	0.03	<0.03	ND	20	94	80	120	95	75	125
Nitrate (as N)	DIO0028-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125
Nitrite (as N)	DIO0032-JUN19	mg/L	0.03	<0.03	3	20	94	80	120	97	75	125
Nitrate (as N)	DIO0032-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125
Nitrite (as N)	DIO0033-JUN19	mg/L	0.03	<0.03	ND	20	95	80	120	100	75	125
Nitrate (as N)	DIO0033-JUN19	mg/L	0.06	<0.06	1	20	99	80	120	107	75	125



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0059-MAY19	mg/L	2	< 2	12	30	99	70	130	96	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0588-MAY19	mg/L	8	<8	ND	20	100	80	120	98	75	125



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Conductivity
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0059-JUN19	uS/cm	2	< 2	1	10	99	90	110	NA		
Conductivity	EWL0069-JUN19	uS/cm	2	< 2	1	10	100	90	110	NA		
Conductivity	EWL0576-MAY19	uS/cm	2	2	1	10	101	90	110	NA		
Conductivity	EWL0601-MAY19	uS/cm	2	< 2	0	10	100	90	110	NA		

Mercury by CVAAS
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0033-MAY19	ug/L	0.01	<0.01	ND	20	116	80	120	124	70	130



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (total)	EMS0219-MAY19	mg/L	0.0002	<0.0002	5	20	99	90	110	95	70	130
Barium (total)	EMS0219-MAY19	mg/L	0.00002	<0.00002	1	20	98	90	110	NV	70	130
Boron (total)	EMS0219-MAY19	mg/L	0.002	<0.002	0	20	96	90	110	NV	70	130
Calcium (total)	EMS0219-MAY19	mg/L	0.01	<0.01	3	20	97	90	110	130	70	130
Cadmium (total)	EMS0219-MAY19	mg/L	0.000003	<0.000003	ND	20	105	90	110	107	70	130
Chromium (total)	EMS0219-MAY19	mg/L	0.00008	<0.00008	8	20	101	90	110	NV	70	130
Copper (total)	EMS0219-MAY19	mg/L	0.0002	<0.0002	2	20	99	90	110	113	70	130
Iron (total)	EMS0219-MAY19	mg/L	0.007	<0.007	8	20	96	90	110	NV	70	130
Potassium (total)	EMS0219-MAY19	mg/L	0.009	<0.009	7	20	96	90	110	NV	70	130
Magnesium (total)	EMS0219-MAY19	mg/L	0.001	<0.001	4	20	98	90	110	116	70	130
Manganese (total)	EMS0219-MAY19	mg/L	0.00001	<0.00001	6	20	102	90	110	NV	70	130
Sodium (total)	EMS0219-MAY19	mg/L	0.01	<0.01	3	20	103	90	110	NV	70	130
Lead (total)	EMS0219-MAY19	mg/L	0.00001	<0.00001	2	20	100	90	110	95	70	130
Zinc (total)	EMS0219-MAY19	mg/L	0.002	<0.002	2	20	100	90	110	104	70	130



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Metals in aqueous samples - ICP-OES
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	EMS0219-MAY19	mg/L	0.003	0.003	15	20	92	90	110	NV	70	130

pH
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0059-JUN19	no unit	0.05	NA	0		100			NA		
pH	EWL0069-JUN19	no unit	0.05	NA	0		100			NA		
pH	EWL0576-MAY19	no unit	0.05	NA	0		100			NA		
pH	EWL0601-MAY19	no unit	0.05	NA	0		101			NA		



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Phenols by SFA
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0025-JUN19	mg/L	0.001	<0.001	ND	10	94	90	110	90	75	125

Solids Analysis
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0010-JUN19	mg/L	30	<30	1	20	100	90	110	NA		
Total Dissolved Solids	EWL0558-MAY19	mg/L	30	<30	3	20	93	90	110	NA		
Total Dissolved Solids	EWL0579-MAY19	mg/L	30	<30	ND	20	98	90	110	NA		



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-~~EN~~VIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0014-JUN19	mg/L	2	< 2	4	10	NV	90	110	NA		
Total Suspended Solids	EWL0030-JUN19	mg/L	2	< 2	3	10	NV	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-~~EN~~VISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0001-JUN19	as N mg/L	0.5	<0.5	ND	10	102	90	110	94	75	125

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

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-- End of Analytical Report --



FINAL REPORT

CA14047-SEP19 R

11193449-01

Prepared for

GHD

First Page

CLIENT DETAILS

Client **GHD**

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Telephone **705-749-3317**

Facsimile

Email **gus.bolin@ghd.com**

Project **11193449-01**

Order Number

Samples **Surface Water (2)**

LABORATORY DETAILS

Project Specialist **Brad Moore Hon. B.Sc**

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Date Reported **09/10/2019**

COMMENTS

SIGNATORIES

Brad Moore Hon. B.Sc

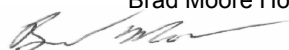




TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-5

QC Summary..... 6-13

Legend..... 14

Annexes..... 15



FINAL REPORT

CA14047-SEP19 R

Client: GHD

Project: 11193449-01

Project Manager: Gus Bolin

Samplers: G Bolin

PACKAGE: - General Chemistry (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	02/09/2019	02/09/2019

Parameter	Units	RL	Result	Result
General Chemistry				
Biochemical Oxygen Demand (BOD5)	mg/L	2	5	34
Total Suspended Solids	mg/L	2	13	83
Alkalinity	mg/L as CaCO3	2	273	168
Conductivity	uS/cm	2	543	358
Total Dissolved Solids	mg/L	30	329	300
Chemical Oxygen Demand	mg/L	8	27	70
Total Kjeldahl Nitrogen	as N mg/L	0.5	0.9	1.7
Ammonia+Ammonium (N)	as N mg/L	0.1	0.2	< 0.1

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	02/09/2019	02/09/2019

Parameter	Units	RL	Result	Result
Metals and Inorganics				
Sulphate	mg/L	2	3	3
Nitrite (as N)	as N mg/L	0.03	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06	< 0.06	< 0.06
Arsenic (total)	mg/L	0.0002	0.0005	0.0026
Barium (total)	mg/L	0.00002	0.0955	0.0880
Boron (total)	mg/L	0.002	0.034	0.030
Calcium (total)	mg/L	0.01	117	71.6



FINAL REPORT

CA14047-SEP19 R

Client: GHD

Project: 11193449-01

Project Manager: Gus Bolin

Samplers: G Bolin

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	02/09/2019	02/09/2019

Parameter	Units	RL	Result	Result
Metals and Inorganics (continued)				
Cadmium (total)	mg/L	0.00000 3	0.000019	0.000010
Chromium (total)	mg/L	0.00008	0.00021	0.00014
Copper (total)	mg/L	0.0002	0.0009	0.0006
Iron (total)	mg/L	0.007	1.51	1.23
Potassium (total)	mg/L	0.009	0.660	8.64
Magnesium (total)	mg/L	0.001	2.81	2.95
Manganese (total)	mg/L	0.00001	0.639	0.494
Sodium (total)	mg/L	0.01	7.64	5.86
Phosphorus (total)	mg/L	0.003	0.037	0.286
Lead (total)	mg/L	0.00001	0.00009	0.00038
Zinc (total)	mg/L	0.002	0.009	0.004



FINAL REPORT

CA14047-SEP19 R

Client: GHD
Project: 11193449-01
Project Manager: Gus Bolin
Samplers: G Bolin

PACKAGE: - Other (ORP) (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	02/09/2019	02/09/2019

Parameter	Units	RL		Result	Result
Other (ORP)					
pH	no unit	0.05		8.00	8.64
Chloride	mg/L	1		13	16
Mercury (total)	µg/L	0.01		< 0.01	< 0.01

PACKAGE: - Phenols (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	02/09/2019	02/09/2019

Parameter	Units	RL		Result	Result
Phenols					
4AAP-Phenolics	mg/L	0.001		0.006	0.009



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

Alkalinity
Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0020-SEP19	mg/L as CaCO3	2	< 2	3	10	103	80	120	NA		

Ammonia by SFA
Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0013-SEP19	as N mg/L	0.1	<0.1	ND	10	99	90	110	99	75	125
Ammonia+Ammonium (N)	SKA0025-SEP19	as N mg/L	0.1	<0.1	0	10	100	90	110	NV	75	125



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0109-SEP19	mg/L	1	<1	1	20	100	80	120	109	75	125
Sulphate	DIO0109-SEP19	mg/L	2	<2	0	20	104	80	120	95	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0019-SEP19	mg/L	0.03	<0.03	6	20	101	80	120	106	75	125
Nitrate (as N)	DIO0019-SEP19	mg/L	0.06	<0.06	2	20	101	80	120	106	75	125



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0001-SEP19	mg/L	2	< 2	8	30	90	70	130	97	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0025-SEP19	mg/L	8	<8	6	20	98	80	120	103	75	125
Chemical Oxygen Demand	EWL0030-SEP19	mg/L	8	<8	9	20	96	80	120	100	75	125

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0020-SEP19	uS/cm	2	< 2	1	10	105	90	110	NA		



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

Mercury by CVAAS
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0002-SEP19	ug/L	0.01	<0.01	ND	20	115	80	120	113	70	130



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (total)	EMS0205-AUG19	mg/L	0.0002	<0.0002	3	20	100	90	110	102	70	130
Barium (total)	EMS0205-AUG19	mg/L	0.00002	<0.00002	1	20	101	90	110	NV	70	130
Boron (total)	EMS0205-AUG19	mg/L	0.002	<0.002	3	20	101	90	110	NV	70	130
Calcium (total)	EMS0205-AUG19	mg/L	0.01	<0.01	1	20	101	90	110	NV	70	130
Cadmium (total)	EMS0205-AUG19	mg/L	0.000003	<0.000003	ND	20	100	90	110	93	70	130
Chromium (total)	EMS0205-AUG19	mg/L	0.00008	<0.00008	3	20	101	90	110	114	70	130
Copper (total)	EMS0205-AUG19	mg/L	0.0002	<0.0002	2	20	100	90	110	96	70	130
Iron (total)	EMS0205-AUG19	mg/L	0.007	<0.007	0	20	102	90	110	NV	70	130
Potassium (total)	EMS0205-AUG19	mg/L	0.009	<0.009	1	20	103	90	110	NV	70	130
Magnesium (total)	EMS0205-AUG19	mg/L	0.001	<0.001	3	20	106	90	110	NV	70	130
Manganese (total)	EMS0205-AUG19	mg/L	0.00001	<0.00001	0	20	99	90	110	NV	70	130
Sodium (total)	EMS0205-AUG19	mg/L	0.01	<0.01	2	20	96	90	110	NV	70	130
Lead (total)	EMS0205-AUG19	mg/L	0.00001	<0.00001	1	20	102	90	110	90	70	130
Phosphorus (total)	EMS0205-AUG19	mg/L	0.003	<0.003	11	20	103	90	110	NV	70	130
Zinc (total)	EMS0205-AUG19	mg/L	0.002	<0.002	3	20	99	90	110	112	70	130



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

pH
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0020-SEP19	no unit	0.05	NA	0		100			NA		

Phenols by SFA
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0021-SEP19	mg/L	0.001	<0.001	ND	10	109	90	110	113	75	125

Solids Analysis
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0006-SEP19	mg/L	30	<30	NV	20	93	90	110	NA		



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0023-SEP19	mg/L	2	< 2	0	10	NV	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0020-SEP19	as N mg/L	0.5	<0.5	1	10	101	90	110	123	75	125

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

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-- End of Analytical Report --



FINAL REPORT

CA14878-OCT19 R

PO#73515229, 11192449-01, Stoney Lake Landfill

Prepared for

GHD

First Page

CLIENT DETAILS

Client GHD

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Project PO#73515229, 11192449-01, Stoney Lake Landfill

Order Number

Samples Ground Water (4)

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COMMENTS

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Brad Moore Hon. B.Sc

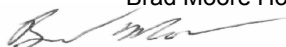




TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-5

Exceedance Summary..... 6

QC Summary..... 7-16

Legend..... 17

Annexes..... 18



FINAL REPORT

CA14878-OCT19 R

Client: GHD

Project: PO#73515229, 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Bus Bolin

PACKAGE: ODWS_AO_OG - BTEX (WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
BTEX							
Benzene	ug/L	0.5		< 0.5	< 0.5	1.0	< 0.5
Toluene	ug/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5

PACKAGE: ODWS_AO_OG - General Chemistry (WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
General Chemistry							
Alkalinity	mg/L as CaCO3	2	500	534	231	247	237
Conductivity	uS/cm	2		1270	513	522	543
Total Dissolved Solids	mg/L	30	500	806	303	297	303
Chemical Oxygen Demand	mg/L	8		16	8	< 8	< 8
Total Kjeldahl Nitrogen	as N mg/L	0.5		6.4	< 0.5	< 0.5	< 0.5
Ammonia+Ammonium (N)	as N mg/L	0.1		5.4	< 0.1	< 0.1	< 0.1
Dissolved Organic Carbon	mg/L	1	5	8	< 1	< 1	< 1



FINAL REPORT

CA14878-OCT19 R

Client: GHD

Project: PO#73515229, 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Bus Bolin

PACKAGE: ODWS_AO_OG - Metals and Inorganics
(WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
Metals and Inorganics							
Phosphorus (total)	mg/L	0.03		0.03	< 0.03	0.14	< 0.03
Sulphate	mg/L	2	500	110	17	7	28
Nitrite (as N)	as N mg/L	0.03		< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06		0.08	< 0.06	1.21	< 0.06
Arsenic (dissolved)	mg/L	0.0002		0.0006	< 0.0002	0.0009	< 0.0002
Barium (dissolved)	mg/L	0.00002		0.393	0.0157	0.0611	0.109
Boron (dissolved)	mg/L	0.002		0.145	0.002	0.015	0.025
Calcium (dissolved)	mg/L	0.01		253	14.1	120	108
Cadmium (dissolved)	mg/L	0.000003		0.000056	< 0.000003	0.000017	0.000010
Chromium (dissolved)	mg/L	0.00008		0.00032	< 0.00008	0.00127	0.00015
Copper (dissolved)	mg/L	0.0002	1	0.0010	< 0.0002	0.0027	0.0008
Iron (dissolved)	mg/L	0.007	0.3	0.221	< 0.007	1.05	0.007
Potassium (dissolved)	mg/L	0.009		8.14	0.120	1.37	1.84
Magnesium (dissolved)	mg/L	0.001		13.6	0.668	2.98	5.10
Manganese (dissolved)	mg/L	0.00001	0.05	4.36	0.00057	0.0863	0.00340
Sodium (dissolved)	mg/L	0.01	200	38.0	1.30	3.34	9.64
Phosphorus (dissolved)	mg/L	0.003		0.004	< 0.003	0.075	< 0.003
Lead (dissolved)	mg/L	0.00001		0.00034	< 0.00001	0.00107	0.00002
Zinc (dissolved)	mg/L	0.002	5	0.003	< 0.002	0.022	0.003



FINAL REPORT

CA14878-OCT19 R

Client: GHD

Project: PO#73515229, 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Bus Bolin

PACKAGE: ODWS_AO_OG - Other (ORP) (WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
Other (ORP)							
pH	no unit	0.05	8.5	7.80	8.07	8.03	8.02
Chloride	mg/L	1	250	55	13	7	18
Mercury (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01

PACKAGE: ODWS_AO_OG - Phenols (WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
Phenols							
4AAP-Phenolics	mg/L	0.002		< 0.002	< 0.002	< 0.002	< 0.002

PACKAGE: ODWS_AO_OG - VOCs (WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
VOCs							
1,4-Dichlorobenzene	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride	µg/L	0.2		< 0.2	< 0.2	< 0.2	< 0.2



EXCEEDANCE SUMMARY

				ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03 L1
Parameter	Method	Units	Result	

TW-6-1

Alkalinity	SM 2320	mg/L	534	500
Total Dissolved Solids	SM 2540C	mg/L	806	500
Manganese (dissolved)	SM 3030/EPA 200.8	µg/L	4.36	0.05
Dissolved Organic Carbon	SM 5310	mg/L	8	5

TW-8-1

Iron (dissolved)	SM 3030/EPA 200.8	µg/L	1.05	0.3
Manganese (dissolved)	SM 3030/EPA 200.8	µg/L	0.0863	0.05



FINAL REPORT

CA14878-OCT19 R

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0520-OCT19	mg/L as CaCO3	2	< 2	0	10	103	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0266-OCT19	as N mg/L	0.1	<0.1	6	10	99	90	110	99	75	125



FINAL REPORT

CA14878-OCT19 R

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0039-NOV19	mg/L	1	<1	1	20	94	80	120	103	75	125
Sulphate	DIO0039-NOV19	mg/L	2	<2	2	20	105	80	120	103	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0602-OCT19	mg/L	0.03	<0.03	ND	20	100	80	120	101	75	125
Nitrate (as N)	DIO0602-OCT19	mg/L	0.06	<0.06	ND	20	102	80	120	106	75	125



FINAL REPORT

CA14878-OCT19 R

QC SUMMARY

Carbon by SFA

Method: SM 5310 | Internal ref.: ME-CA-|ENV|SFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0007-NOV19	mg/L	1	<1	1	20	91	90	110	107	75	125
Dissolved Organic Carbon	SKA0022-NOV19	mg/L	1	<1	4	20	101	90	110	88	75	125

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-|ENV|EWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0529-OCT19	mg/L	8	<8	0	20	100	80	120	99	75	125
Chemical Oxygen Demand	EWL0551-OCT19	mg/L	8	<8	0	20	94	80	120	101	75	125
Chemical Oxygen Demand	EWL0554-OCT19	mg/L	8	<8	ND	20	96	80	120	99	75	125



FINAL REPORT

CA14878-OCT19 R

QC SUMMARY

Conductivity
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0520-OCT19	uS/cm	2	< 2	0	10	100	90	110	NA		

Mercury by CVAAS
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0035-OCT19	ug/L	0.01	<0.01	ND	20	97	80	120	112	70	130



FINAL REPORT

CA14878-OCT19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (dissolved)	EMS0012-NOV19	mg/L	0.0002	<0.0002	10	20	108	90	110	102	70	130
Barium (dissolved)	EMS0012-NOV19	mg/L	0.00002	<0.00002	1	20	98	90	110	NV	70	130
Boron (dissolved)	EMS0012-NOV19	mg/L	0.002	<0.002	2	20	97	90	110	NV	70	130
Calcium (dissolved)	EMS0012-NOV19	mg/L	0.01	<0.01	3	20	99	90	110	120	70	130
Cadmium (dissolved)	EMS0012-NOV19	mg/L	0.000003	<0.000003	ND	20	109	90	110	101	70	130
Chromium (dissolved)	EMS0012-NOV19	mg/L	0.00008	<0.00008	2	20	103	90	110	82	70	130
Copper (dissolved)	EMS0012-NOV19	mg/L	0.0002	<0.0002	14	20	109	90	110	103	70	130
Iron (dissolved)	EMS0012-NOV19	mg/L	0.007	<0.007	3	20	100	90	110	NV	70	130
Potassium (dissolved)	EMS0012-NOV19	mg/L	0.009	<0.009	2	20	100	90	110	NV	70	130
Magnesium (dissolved)	EMS0012-NOV19	mg/L	0.001	<0.001	3	20	99	90	110	78	70	130
Manganese (dissolved)	EMS0012-NOV19	mg/L	0.00001	<0.00001	5	20	107	90	110	NV	70	130
Sodium (dissolved)	EMS0012-NOV19	mg/L	0.01	<0.01	5	20	106	90	110	120	70	130
Lead (dissolved)	EMS0012-NOV19	mg/L	0.00001	<0.00001	11	20	95	90	110	87	70	130
Phosphorus (dissolved)	EMS0012-NOV19	mg/L	0.003	<0.003	6	20	98	90	110	NV	70	130
Zinc (dissolved)	EMS0012-NOV19	mg/L	0.002	<0.002	0	20	108	90	110	110	70	130
Boron (dissolved)	EMS0059-NOV19	mg/L	0.002	<0.002	4	20	95	90	110	NV	70	130
Arsenic (dissolved)	EMS0217-OCT19	mg/L	0.0002	<0.0002	6	20	101	90	110	NV	70	130
Barium (dissolved)	EMS0217-OCT19	mg/L	0.00002	<0.00002	2	20	96	90	110	NV	70	130
Boron (dissolved)	EMS0217-OCT19	mg/L	0.002	<0.002	10	20	106	90	110	NV	70	130
Calcium (dissolved)	EMS0217-OCT19	mg/L	0.01	<0.01	1	20	97	90	110	NV	70	130



FINAL REPORT

CA14878-OCT19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cadmium (dissolved)	EMS0217-OCT19	mg/L	0.000003	<0.000003	ND	20	100	90	110	107	70	130
Chromium (dissolved)	EMS0217-OCT19	mg/L	0.00008	<0.00008	12	20	101	90	110	105	70	130
Copper (dissolved)	EMS0217-OCT19	mg/L	0.0002	<0.0002	5	20	101	90	110	NV	70	130
Iron (dissolved)	EMS0217-OCT19	mg/L	0.007	<0.007	ND	20	99	90	110	NV	70	130
Potassium (dissolved)	EMS0217-OCT19	mg/L	0.009	<0.009	0	20	96	90	110	89	70	130
Magnesium (dissolved)	EMS0217-OCT19	mg/L	0.001	<0.001	6	20	96	90	110	NV	70	130
Manganese (dissolved)	EMS0217-OCT19	mg/L	0.00001	<0.00001	ND	20	101	90	110	NV	70	130
Sodium (dissolved)	EMS0217-OCT19	mg/L	0.01	<0.01	2	20	110	90	110	NV	70	130
Lead (dissolved)	EMS0217-OCT19	mg/L	0.00001	<0.00001	ND	20	91	90	110	91	70	130
Phosphorus (dissolved)	EMS0217-OCT19	mg/L	0.003	<0.003	5	20	97	90	110	NV	70	130
Zinc (dissolved)	EMS0217-OCT19	mg/L	0.002	<0.002	ND	20	102	90	110	111	70	130
Arsenic (dissolved)	EMS9005-NOV19	mg/L	0.0002	<0.0002	6	20	99	90	110	99	70	130
Barium (dissolved)	EMS9005-NOV19	mg/L	0.00002	<0.00002	2	20	93	90	110	NV	70	130
Boron (dissolved)	EMS9005-NOV19	mg/L	0.002	<0.002	4	20	91	90	110	NV	70	130
Calcium (dissolved)	EMS9005-NOV19	mg/L	0.01	<0.01	6	20	99	90	110	NV	70	130
Cadmium (dissolved)	EMS9005-NOV19	mg/L	0.000003	<0.000003	ND	20	100	90	110	98	70	130
Chromium (dissolved)	EMS9005-NOV19	mg/L	0.00008	<0.00008	3	20	105	90	110	111	70	130
Copper (dissolved)	EMS9005-NOV19	mg/L	0.0002	<0.0002	15	20	100	90	110	115	70	130
Iron (dissolved)	EMS9005-NOV19	mg/L	0.007	<0.007	17	20	97	90	110	NV	70	130
Potassium (dissolved)	EMS9005-NOV19	mg/L	0.009	<0.009	7	20	95	90	110	NV	70	130



FINAL REPORT

CA14878-OCT19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Magnesium (dissolved)	EMS9005-NOV19	mg/L	0.001	<0.001	6	20	99	90	110	NV	70	130
Manganese (dissolved)	EMS9005-NOV19	mg/L	0.00001	<0.00001	6	20	97	90	110	NV	70	130
Sodium (dissolved)	EMS9005-NOV19	mg/L	0.01	<0.01	5	20	106	90	110	NV	70	130
Lead (dissolved)	EMS9005-NOV19	mg/L	0.00001	<0.00001	2	20	95	90	110	76	70	130
Phosphorus (dissolved)	EMS9005-NOV19	mg/L	0.003	<0.003	7	20	107	90	110	NV	70	130
Zinc (dissolved)	EMS9005-NOV19	mg/L	0.002	<0.002	14	20	97	90	110	88	70	130

pH

Method: SM 4500 | Internal ref.: ME-CA-ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0520-OCT19	no unit	0.05	NA	1		100			NA		



FINAL REPORT

CA14878-OCT19 R

QC SUMMARY

Phenols by SFA
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0004-NOV19	mg/L	0.002	<0.002	7	10	109	90	110	107	75	125

Phosphorus by SFA
Method: SM 4500-P J | Internal ref.: ME-CA-IENVISFA-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	SKA0264-OCT19	mg/L	0.03	<0.03	0	10	107	90	110	90	75	125

Solids Analysis
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0519-OCT19	mg/L	30	<30	0	20	92	90	110	NA		
Total Dissolved Solids	EWL0521-OCT19	mg/L	30	<30	1	20	105	90	110	NA		



FINAL REPORT

CA14878-OCT19 R

QC SUMMARY

Total Nitrogen
Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0279-OCT19	as N mg/L	0.5	<0.5	1	10	94	90	110	106	75	125

Volatile Organics
Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,4-Dichlorobenzene	GCM0550-OCT19	ug/L	0.5	<0.5	ND	30	101	60	130	105	50	140
Benzene	GCM0550-OCT19	ug/L	0.5	<0.5	ND	30	100	60	130	105	50	140
Dichloromethane	GCM0550-OCT19	ug/L	0.5	<0.5	ND	30	99	60	130	104	50	140
Toluene	GCM0550-OCT19	ug/L	0.5	<0.5	ND	30	101	60	130	106	50	140
Vinyl Chloride	GCM0550-OCT19	ug/L	0.2	<0.2	ND	30	104	60	130	107	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

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-- End of Analytical Report --



FINAL REPORT

CA14876-OCT19 R

11192449-01, Stoney Lake Landfill

Prepared for

GHD

First Page

CLIENT DETAILS

Client GHD

Address 347 Pido Rd., Unit #29, Peterborough
Canada, K9J 6Z8
Phone: 705-749-3317. Fax:

Contact Gus Bolin

Telephone 705-749-3317

Facsimile

Email gus.bolin@ghd.com

Project 11192449-01, Stoney Lake Landfill

Order Number

Samples Ground Water (3)

LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

Laboratory SGS Canada Inc.

Address 185 Concession St., Lakefield ON, K0L 2H0

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SGS Reference CA14876-OCT19

Received 10/29/2019

Approved 11/08/2019

Report Number CA14876-OCT19 R

Date Reported 11/08/2019

COMMENTS

Temperature of Sample upon Receipt: 8 degrees C

Cooling Agent Present: Yes

Custody Seal Present: No

Chain of Custody Number: NA

SIGNATORIES

Brad Moore Hon. B.Sc

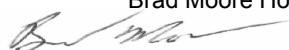




TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-5

Exceedance Summary..... 6

QC Summary..... 7-12

Legend..... 13

Annexes..... 14



FINAL REPORT

CA14876-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: ODWS_AO_OG - General Chemistry

(WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

Sample Number	5	6	7
Sample Name	TW-2-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result
General Chemistry						
Alkalinity	mg/L as CaCO ₃	2	500	252	436	413
Conductivity	uS/cm	2		581	1360	2800
Total Dissolved Solids	mg/L	30	500	334	966	2670
Chemical Oxygen Demand	mg/L	8		< 8	24	25
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	0.2	0.6
Dissolved Organic Carbon	mg/L	1	5	< 1	8	11

PACKAGE: ODWS_AO_OG - Metals and Inorganics

(WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

Sample Number	5	6	7
Sample Name	TW-2-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result
Metals and Inorganics						
Sulphate	mg/L	2	500	7	340	1100
Nitrate (as N)	as N mg/L	0.06		3.71	1.33	< 0.06
Arsenic (dissolved)	mg/L	0.0002		< 0.0002	0.0004	< 0.0002
Barium (dissolved)	mg/L	0.00002		0.0230	0.0701	0.00597
Boron (dissolved)	mg/L	0.002		0.008	0.090	0.374
Calcium (dissolved)	mg/L	0.01		112	305	57.9
Cadmium (dissolved)	mg/L	0.00000		< 0.000003	0.000004	< 0.000003
		3				



FINAL REPORT

CA14876-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: ODWS_AO_OG - Metals and Inorganics
(WATER)

Sample Number	5	6	7
Sample Name	TW-2-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	Result	Result	Result
Metals and Inorganics (continued)						
Chromium (dissolved)	mg/L	0.00008		0.00024	0.00039	< 0.00008
Copper (dissolved)	mg/L	0.0002	1	0.0006	0.0012	< 0.0002
Iron (dissolved)	mg/L	0.007	0.3	0.129	0.077	1.45
Potassium (dissolved)	mg/L	0.009		0.771	1.91	0.573
Magnesium (dissolved)	mg/L	0.001		2.10	7.31	7.95
Manganese (dissolved)	mg/L	0.00001	0.05	0.00054	0.0313	0.117
Sodium (dissolved)	mg/L	0.01	200	4.62	31.0	11.7
Phosphorus (dissolved)	mg/L	0.003		< 0.003	0.013	0.003
Lead (dissolved)	mg/L	0.00001		0.00004	0.00011	< 0.00001
Zinc (dissolved)	mg/L	0.002	5	0.003	0.004	< 0.002



FINAL REPORT

CA14876-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: ODWS_AO_OG - Other (ORP) (WATER)

Sample Number	5	6	7
Sample Name	TW-2-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	Result	Result	Result
Other (ORP)						
pH	no unit	0.05	8.5	8.02	7.72	7.62
Chloride	mg/L	1	250	8	43	170



EXCEEDANCE SUMMARY

				ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03 L1
Parameter	Method	Units	Result	

TW-4-1

Total Dissolved Solids	SM 2540C	mg/L	966	500
Dissolved Organic Carbon	SM 5310	mg/L	8	5

TW-5-1

Total Dissolved Solids	SM 2540C	mg/L	2670	500
Iron (dissolved)	SM 3030/EPA 200.8	µg/L	1.45	0.3
Manganese (dissolved)	SM 3030/EPA 200.8	µg/L	0.117	0.05
Dissolved Organic Carbon	SM 5310	mg/L	11	5
Sulphate	US EPA 375.4	mg/L	1100	500



FINAL REPORT

CA14876-OCT19 R

QC SUMMARY

Alkalinity
Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0520-OCT19	mg/L as CaCO3	2	< 2	0	10	103	80	120	NA		

Ammonia by SFA
Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0266-OCT19	as N mg/L	0.1	<0.1	6	10	99	90	110	99	75	125



FINAL REPORT

CA14876-OCT19 R

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0012-NOV19	mg/L	1	<1	2	20	103	80	120	107	75	125
Sulphate	DIO0012-NOV19	mg/L	2	<2	1	20	107	80	120	107	75	125
Sulphate	DIO0039-NOV19	mg/L	2	<2	2	20	105	80	120	103	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate (as N)	DIO0592-OCT19	mg/L	0.06	<0.06	0	20	99	80	120	96	75	125
Nitrate (as N)	DIO0605-OCT19	mg/L	0.06	<0.06	0	20	101	80	120	109	75	125



FINAL REPORT

CA14876-OCT19 R

QC SUMMARY

Carbon by SFA
Method: SM 5310 | Internal ref.: ME-CA-IENVISFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0007-NOV19	mg/L	1	<1	1	20	91	90	110	107	75	125

Chemical Oxygen Demand
Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0529-OCT19	mg/L	8	<8	0	20	100	80	120	99	75	125
Chemical Oxygen Demand	EWL0551-OCT19	mg/L	8	<8	0	20	94	80	120	101	75	125

Conductivity
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0520-OCT19	uS/cm	2	< 2	0	10	100	90	110	NA		



FINAL REPORT

CA14876-OCT19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (dissolved)	EMS0012-NOV19	mg/L	0.0002	<0.0002	10	20	108	90	110	102	70	130
Barium (dissolved)	EMS0012-NOV19	mg/L	0.00002	<0.00002	1	20	98	90	110	NV	70	130
Boron (dissolved)	EMS0012-NOV19	mg/L	0.002	<0.002	2	20	97	90	110	NV	70	130
Calcium (dissolved)	EMS0012-NOV19	mg/L	0.01	<0.01	3	20	99	90	110	120	70	130
Cadmium (dissolved)	EMS0012-NOV19	mg/L	0.000003	<0.000003	ND	20	109	90	110	101	70	130
Chromium (dissolved)	EMS0012-NOV19	mg/L	0.00008	<0.00008	2	20	103	90	110	82	70	130
Copper (dissolved)	EMS0012-NOV19	mg/L	0.0002	<0.0002	14	20	109	90	110	103	70	130
Iron (dissolved)	EMS0012-NOV19	mg/L	0.007	<0.007	3	20	100	90	110	NV	70	130
Potassium (dissolved)	EMS0012-NOV19	mg/L	0.009	<0.009	2	20	100	90	110	NV	70	130
Magnesium (dissolved)	EMS0012-NOV19	mg/L	0.001	<0.001	3	20	99	90	110	78	70	130
Manganese (dissolved)	EMS0012-NOV19	mg/L	0.00001	<0.00001	5	20	107	90	110	NV	70	130
Sodium (dissolved)	EMS0012-NOV19	mg/L	0.01	<0.01	5	20	106	90	110	120	70	130
Lead (dissolved)	EMS0012-NOV19	mg/L	0.00001	<0.00001	11	20	95	90	110	87	70	130
Phosphorus (dissolved)	EMS0012-NOV19	mg/L	0.003	<0.003	6	20	98	90	110	NV	70	130
Zinc (dissolved)	EMS0012-NOV19	mg/L	0.002	<0.002	0	20	108	90	110	110	70	130
Arsenic (dissolved)	EMS9005-NOV19	mg/L	0.0002	<0.0002	6	20	99	90	110	99	70	130
Barium (dissolved)	EMS9005-NOV19	mg/L	0.00002	<0.00002	2	20	93	90	110	NV	70	130
Boron (dissolved)	EMS9005-NOV19	mg/L	0.002	<0.002	4	20	91	90	110	NV	70	130
Calcium (dissolved)	EMS9005-NOV19	mg/L	0.01	<0.01	6	20	99	90	110	NV	70	130
Cadmium (dissolved)	EMS9005-NOV19	mg/L	0.000003	<0.000003	ND	20	100	90	110	98	70	130



FINAL REPORT

CA14876-OCT19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium (dissolved)	EMS9005-NOV19	mg/L	0.00008	<0.00008	3	20	105	90	110	111	70	130
Copper (dissolved)	EMS9005-NOV19	mg/L	0.0002	<0.0002	15	20	100	90	110	115	70	130
Iron (dissolved)	EMS9005-NOV19	mg/L	0.007	<0.007	17	20	97	90	110	NV	70	130
Potassium (dissolved)	EMS9005-NOV19	mg/L	0.009	<0.009	7	20	95	90	110	NV	70	130
Magnesium (dissolved)	EMS9005-NOV19	mg/L	0.001	<0.001	6	20	99	90	110	NV	70	130
Manganese (dissolved)	EMS9005-NOV19	mg/L	0.00001	<0.00001	6	20	97	90	110	NV	70	130
Sodium (dissolved)	EMS9005-NOV19	mg/L	0.01	<0.01	5	20	106	90	110	NV	70	130
Lead (dissolved)	EMS9005-NOV19	mg/L	0.00001	<0.00001	2	20	95	90	110	76	70	130
Phosphorus (dissolved)	EMS9005-NOV19	mg/L	0.003	<0.003	7	20	107	90	110	NV	70	130
Zinc (dissolved)	EMS9005-NOV19	mg/L	0.002	<0.002	14	20	97	90	110	88	70	130

pH

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0520-OCT19	no unit	0.05	NA	1		100			NA		



FINAL REPORT

CA14876-OCT19 R

QC SUMMARY

Solids Analysis
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0519-OCT19	mg/L	30	<30	0	20	92	90	110	NA		

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

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-- End of Analytical Report --



FINAL REPORT

CA14875-OCT19 R

11192449-01, Stoney Lake Landfill

Prepared for

GHD

First Page

CLIENT DETAILS

Client GHD

Address 347 Pido Rd., Unit #29, Peterborough
Canada, K9J 6Z8
Phone: 705-749-3317. Fax:

Contact Gus Bolin

Telephone 705-749-3317

Facsimile

Email gus.bolin@ghd.com

Project 11192449-01, Stoney Lake Landfill

Order Number

Samples Ground Water (6)

LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

Laboratory SGS Canada Inc.

Address 185 Concession St., Lakefield ON, K0L 2H0

Telephone 705-652-2143

Facsimile 705-652-6365

Email brad.moore@sgs.com

SGS Reference CA14875-OCT19

Received 10/29/2019

Approved 11/08/2019

Report Number CA14875-OCT19 R

Date Reported 11/08/2019

COMMENTS

Temperature of Sample upon Receipt: 8 degrees C

Cooling Agent Present:Yes

Custody Seal Present:No

Chain of Custody Number:NA

SIGNATORIES

Brad Moore Hon. B.Sc

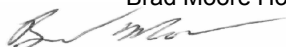




TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-7

Exceedance Summary..... 8

QC Summary..... 9-18

Legend..... 19

Annexes..... 20



FINAL REPORT

CA14875-OCT19 R

Client: GHD
Project: 11192449-01, Stoney Lake Landfill
Project Manager: Gus Bolin
Samplers: Gus Bolin

PACKAGE: PWQO - BTEX (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	7
Sample Name	TW-2-2	TW-6-2
Sample Matrix	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result
BTEX					
Benzene	ug/L	0.5	100	< 0.5	< 0.5
Ethylbenzene	ug/L	0.5	8	< 0.5	< 0.5
Toluene	ug/L	0.5	0.8	< 0.5	< 0.5
Xylene (total)	ug/L	0.5		< 0.5	< 0.5
o-xylene	ug/L	0.5	40	< 0.5	< 0.5
m/p-xylene	ug/L	0.5	2	< 0.5	< 0.5

PACKAGE: PWQO - General Chemistry (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	6	7	8	9	10
Sample Name	TW-2-2	TW-5-2	TW-6-2	TW-7-2	TW-9-2	TW-11-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
General Chemistry									
Biochemical Oxygen Demand (BOD5)	mg/L	2		< 4 †	< 4 †	< 4 †	< 4 †	< 4 †	< 4 †
Alkalinity	mg/L as CaCO3	2		569	493	415	345	215	646
Conductivity	uS/cm	2		1480	3810	1350	1730	384	1560
Total Dissolved Solids	mg/L	30		1140	3690	909	1320	291	891
Chemical Oxygen Demand	mg/L	8		25	45	11	13	< 8	51
Total Kjeldahl Nitrogen	as N mg/L	0.5		< 0.5	0.7	0.6	< 0.5	< 0.5	31.8
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	< 0.1	0.7	0.2	0.1	33.4



FINAL REPORT

CA14875-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: PWQO - Metals and Inorganics (WATER)

Sample Number	5	6	7	8	9	10
Sample Name	TW-2-2	TW-5-2	TW-6-2	TW-7-2	TW-9-2	TW-11-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
Metals and Inorganics									
Phosphorus (total)	mg/L	0.03		0.03	0.10	0.03	0.04	< 0.03	< 0.03
Sulphate	mg/L	2		320	2200	140	460	10	170
Nitrite (as N)	as N mg/L	0.03		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06		< 0.06	5.89	0.15	< 0.06	0.09	< 0.06
Arsenic (dissolved)	mg/L	0.0002		0.0008	0.0005	< 0.0002	0.0007	< 0.0002	0.0005
Barium (dissolved)	mg/L	0.00002		0.125	0.0249	0.287	0.0965	0.210	0.404
Boron (dissolved)	mg/L	0.002		0.236	10.2	0.359	1.49		0.371
Boron (dissolved)	mg/L	0.002						0.011	
Calcium (dissolved)	mg/L	0.01		358	561	252	263	86.8	212
Cadmium (dissolved)	mg/L	0.000003		0.000019	0.000014	0.000012	0.000005	< 0.000003	0.000011
Chromium (dissolved)	mg/L	0.00008		0.00034	0.00033	0.00014	0.00015	0.00009	0.00041
Copper (dissolved)	mg/L	0.0002		0.0008	0.0226	0.0019	0.0003	0.0007	0.0008
Iron (dissolved)	mg/L	0.007		0.068	0.011	0.010	0.267	0.017	8.11
Potassium (dissolved)	mg/L	0.009		1.01	2.61	4.39	2.48	0.723	29.2
Magnesium (dissolved)	mg/L	0.001		14.8	210	15.1	30.5	2.87	24.5
Manganese (dissolved)	mg/L	0.00001		2.41	0.0529	1.32	2.25	0.00726	1.52
Sodium (dissolved)	mg/L	0.01		15.8	206	36.6	123	3.09	49.9
Lead (dissolved)	mg/L	0.00001		0.00003	0.00063	0.00003	0.00003	0.00004	0.00004



FINAL REPORT

CA14875-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: PWQO - Other (ORP) (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	6	7	8	9	10
Sample Name	TW-2-2	TW-5-2	TW-6-2	TW-7-2	TW-9-2	TW-11-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
Other (ORP)									
pH	no unit	0.05	8.5	7.53	7.76	7.77	7.78	8.26	7.06
Chloride	mg/L	1		20	210	110	130	4	56
Mercury (total)	µg/L	0.01	0.2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

PACKAGE: PWQO - Phenols (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	6	7	8	9	10
Sample Name	TW-2-2	TW-5-2	TW-6-2	TW-7-2	TW-9-2	TW-11-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
Phenols									
4AAP-Phenolics	mg/L	0.001	0.001	0.003	0.008	0.004	0.002	< 0.001	0.004

PACKAGE: PWQO - THMs (VOC) (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	7
Sample Name	TW-2-2	TW-6-2
Sample Matrix	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result
THMs (VOC)					
Bromodichloromethane	µg/L	0.5	200	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	< 0.5	< 0.5
Dibromochloromethane	µg/L	0.5	40	< 0.5	< 0.5



FINAL REPORT

CA14875-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: PWQO - VOCs (WATER)

Sample Number	5	7
Sample Name	TW-2-2	TW-6-2
Sample Matrix	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
VOCs					
Bromomethane	µg/L	0.5	0.9	< 0.5	< 0.5
Carbon tetrachloride	µg/L	0.2		< 0.2	< 0.2
Chloroethane	µg/L	5.0		< 5	< 5
Chloroform	µg/L	0.5		< 0.5	< 0.5
Chloromethane	µg/L	5.0		< 5	< 5
1,2-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	< 0.5	< 0.5
1,1-Dichloroethane	µg/L	0.5	200	< 0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	100	< 0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	40	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	< 0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	200	< 0.5	< 0.5
cis-1,2-Dichloroethene	µg/L	0.5	200	< 0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5		< 0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5	7	< 0.5	< 0.5
Ethylenedibromide	µg/L	0.2	5	< 0.2	< 0.2
Dichloromethane	µg/L	0.5		< 0.5	< 0.5
Monochlorobenzene	µg/L	0.5		< 0.5	< 0.5
Styrene	µg/L	0.5	4	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	< 0.5	< 0.5
Tetrachloroethene	µg/L	0.5		< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	20	< 0.5	< 0.5



FINAL REPORT

CA14875-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: PWQO - VOCs (WATER)

Sample Number	5	7
Sample Name	TW-2-2	TW-6-2
Sample Matrix	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
VOCs (continued)					
Vinyl Chloride	µg/L	0.2	600	< 0.2	< 0.2
Trichlorofluoromethane	µg/L	5.0		< 5	< 5
1,1,1-Trichloroethane	µg/L	0.5	10	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	< 0.5	< 0.5



EXCEEDANCE SUMMARY

				PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E L1
Parameter	Method	Units	Result	

TW-2-2

4AAP-Phenolics	SM 5530B-D	mg/L	0.003	0.001
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TW-5-2

4AAP-Phenolics	SM 5530B-D	mg/L	0.008	0.001
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TW-6-2

4AAP-Phenolics	SM 5530B-D	mg/L	0.004	0.001
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TW-7-2

4AAP-Phenolics	SM 5530B-D	mg/L	0.002	0.001
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TW-11-2

4AAP-Phenolics	SM 5530B-D	mg/L	0.004	0.001
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FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0520-OCT19	mg/L as CaCO ₃	2	< 2	0	10	103	80	120	NA		
Alkalinity	EWL0527-OCT19	mg/L as CaCO ₃	2	< 2	1	10	95	80	120	NA		
Alkalinity	EWL0543-OCT19	mg/L as CaCO ₃	2	< 2	1	10	103	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0266-OCT19	as N mg/L	0.1	<0.1	6	10	99	90	110	99	75	125
Ammonia+Ammonium (N)	SKA0278-OCT19	as N mg/L	0.1	<0.1	ND	10	100	90	110	99	75	125

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0012-NOV19	mg/L	1	<1	2	20	103	80	120	107	75	125
Sulphate	DIO0012-NOV19	mg/L	2	<2	1	20	107	80	120	107	75	125
Sulphate	DIO0039-NOV19	mg/L	2	<2	2	20	105	80	120	103	75	125
Sulphate	DIO0044-NOV19	mg/L	2	<2	0	20	95	80	120	109	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0592-OCT19	mg/L	0.03	<0.03	2	20	96	80	120	99	75	125
Nitrate (as N)	DIO0592-OCT19	mg/L	0.06	<0.06	0	20	99	80	120	96	75	125
Nitrite (as N)	DIO0605-OCT19	mg/L	0.03	<0.03	ND	20	100	80	120	85	75	125
Nitrate (as N)	DIO0605-OCT19	mg/L	0.06	<0.06	0	20	101	80	120	109	75	125



FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0054-OCT19	mg/L	2	< 2	4	30	93	70	130	89	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0529-OCT19	mg/L	8	<8	0	20	100	80	120	99	75	125
Chemical Oxygen Demand	EWL0551-OCT19	mg/L	8	<8	0	20	94	80	120	101	75	125
Chemical Oxygen Demand	EWL0554-OCT19	mg/L	8	<8	ND	20	96	80	120	99	75	125



FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

Conductivity
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0520-OCT19	uS/cm	2	< 2	0	10	100	90	110	NA		
Conductivity	EWL0527-OCT19	uS/cm	2	3	2	10	99	90	110	NA		
Conductivity	EWL0543-OCT19	uS/cm	2	< 2	3	10	99	90	110	NA		

Mercury by CVAAS
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0035-OCT19	ug/L	0.01	<0.01	ND	20	97	80	120	112	70	130



FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Boron (dissolved)	EMS0059-NOV19	mg/L	0.002	<0.002	4	20	95	90	110	NV	70	130
Arsenic (dissolved)	EMS0217-OCT19	mg/L	0.0002	<0.0002	6	20	101	90	110	NV	70	130
Barium (dissolved)	EMS0217-OCT19	mg/L	0.00002	<0.00002	2	20	96	90	110	NV	70	130
Boron (dissolved)	EMS0217-OCT19	mg/L	0.002	<0.002	10	20	106	90	110	NV	70	130
Calcium (dissolved)	EMS0217-OCT19	mg/L	0.01	<0.01	1	20	97	90	110	NV	70	130
Cadmium (dissolved)	EMS0217-OCT19	mg/L	0.000003	<0.000003	ND	20	100	90	110	107	70	130
Chromium (dissolved)	EMS0217-OCT19	mg/L	0.00008	<0.00008	12	20	101	90	110	105	70	130
Copper (dissolved)	EMS0217-OCT19	mg/L	0.0002	<0.0002	5	20	101	90	110	NV	70	130
Iron (dissolved)	EMS0217-OCT19	mg/L	0.007	<0.007	ND	20	99	90	110	NV	70	130
Potassium (dissolved)	EMS0217-OCT19	mg/L	0.009	<0.009	0	20	96	90	110	89	70	130
Magnesium (dissolved)	EMS0217-OCT19	mg/L	0.001	<0.001	6	20	96	90	110	NV	70	130
Manganese (dissolved)	EMS0217-OCT19	mg/L	0.00001	<0.00001	ND	20	101	90	110	NV	70	130
Sodium (dissolved)	EMS0217-OCT19	mg/L	0.01	<0.01	2	20	110	90	110	NV	70	130
Lead (dissolved)	EMS0217-OCT19	mg/L	0.00001	<0.00001	ND	20	91	90	110	91	70	130



FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

pH
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0520-OCT19	no unit	0.05	NA	1		100			NA		
pH	EWL0527-OCT19	no unit	0.05	NA	0		100			NA		
pH	EWL0543-OCT19	no unit	0.05	NA	1		100			NA		

Phenols by SFA
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0004-NOV19	mg/L	0.001	<0.001	7	10	109	90	110	107	75	125



FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

Phosphorus by SFA
Method: SM 4500-P J | Internal ref.: ME-CA-IENVISFA-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	SKA0264-OCT19	mg/L	0.03	<0.03	0	10	107	90	110	90	75	125

Solids Analysis
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0521-OCT19	mg/L	30	<30	1	20	105	90	110	NA		

Total Nitrogen
Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0002-NOV19	as N mg/L	0.5	<0.5	0	10	97	90	110	87	75	125
Total Kjeldahl Nitrogen	SKA0279-OCT19	as N mg/L	0.5	<0.5	1	10	94	90	110	106	75	125



FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	102	50	140
1,1,1-Trichloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	97	60	130	97	50	140
1,1,2,2-Tetrachloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	98	50	140
1,1,2-Trichloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	97	50	140
1,1-Dichloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	94	60	130	93	50	140
1,1-Dichloroethylene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	97	60	130	96	50	140
1,2-Dichlorobenzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	99	50	140
1,2-Dichloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	99	60	130	94	50	140
1,2-Dichloropropane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	101	50	140
1,3-Dichlorobenzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	99	50	140
1,4-Dichlorobenzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	100	50	140
Benzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	100	50	140
Bromodichloromethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	101	50	140
Bromoform	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	100	60	130	95	50	140
Bromomethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	105	50	140	101	50	140
Carbon tetrachloride	GCM0011-NOV19	ug/L	0.2	<0.2	ND	30	101	60	130	101	50	140
Chloroethane	GCM0011-NOV19	ug/L	5.0	<5	ND	30	72	60	130	92	50	140
Chloroform	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	100	50	140
Chloromethane	GCM0011-NOV19	ug/L	5.0	<5	ND	30	112	60	130	118	50	140
cis-1,2-Dichloroethene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	101	50	140



FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
cis-1,3-Dichloropropene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	98	50	140
Dibromochloromethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	98	50	140
Dichloromethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	99	60	130	96	50	140
Ethylbenzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	102	50	140
Ethylenedibromide	GCM0011-NOV19	ug/L	0.2	<0.2	ND	30	102	60	130	97	50	140
m/p-xylene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	103	60	130	101	50	140
Monochlorobenzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	101	50	140
o-xylene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	102	50	140
Styrene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	103	60	130	102	50	140
Tetrachloroethene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	101	50	140
Toluene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	101	50	140
trans-1,2-Dichloroethene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	95	60	130	93	50	140
trans-1,3-Dichloropropene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	97	50	140
Trichloroethylene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	100	50	140
Trichlorofluoromethane	GCM0011-NOV19	ug/L	5.0	<5	ND	30	111	50	140	109	50	140
Vinyl Chloride	GCM0011-NOV19	ug/L	0.2	<0.2	ND	30	104	60	130	103	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

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-- End of Analytical Report --



FINAL REPORT

CA14877-OCT19 R

11192449-01, Stoney Lake Landfill

Prepared for

GHD

First Page

CLIENT DETAILS

Client GHD

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Facsimile

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Project 11192449-01, Stoney Lake Landfill

Order Number

Samples Surface Water (2)

LABORATORY DETAILS

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SGS Reference CA14877-OCT19

Received 10/29/2019

Approved 11/05/2019

Report Number CA14877-OCT19 R

Date Reported 11/05/2019

COMMENTS

Temperature of Sample upon Receipt: 7 degrees C

Cooling Agent Present:Yes

Custody Seal Present:Yes

Chain of Custody Number:NA

SIGNATORIES

Brad Moore Hon. B.Sc

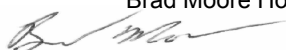




TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-5

Exceedance Summary..... 6

QC Summary..... 7-14

Legend..... 15

Annexes..... 16



FINAL REPORT

CA14877-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: **PWQO - General Chemistry** (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	28/10/2019	28/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
General Chemistry					
Biochemical Oxygen Demand (BOD5)	mg/L	2		< 4 †	< 4 †
Total Suspended Solids	mg/L	2		2	3
Alkalinity	mg/L as CaCO3	2		164	139
Conductivity	uS/cm	2		402	372
Total Dissolved Solids	mg/L	30		286	274
Chemical Oxygen Demand	mg/L	8		27	30
Total Kjeldahl Nitrogen	as N mg/L	0.5		< 0.5	< 0.5
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	< 0.1

PACKAGE: **PWQO - Metals and Inorganics** (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	28/10/2019	28/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
Metals and Inorganics					
Sulphate	mg/L	2		33	32
Nitrite (as N)	as N mg/L	0.03		< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06		< 0.06	1.65
Arsenic (total)	mg/L	0.0002	0.005	0.0005	0.0005
Barium (total)	mg/L	0.00002		0.0599	0.0605
Boron (total)	mg/L	0.002	0.2	0.018	0.015
Calcium (total)	mg/L	0.01		81.0	68.9



FINAL REPORT

CA14877-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: PWQO - Metals and Inorganics (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	28/10/2019	28/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
Metals and Inorganics (continued)					
Cadmium (total)	mg/L	0.000003	0.0001	0.000003	0.000098
Chromium (total)	mg/L	0.00008		0.00015	0.00017
Copper (total)	mg/L	0.0002	0.001	0.0005	0.0004
Iron (total)	mg/L	0.007	0.3	0.106	0.036
Potassium (total)	mg/L	0.009		2.06	1.97
Magnesium (total)	mg/L	0.001		2.39	2.31
Manganese (total)	mg/L	0.00001		0.0168	0.0101
Sodium (total)	mg/L	0.01		10.9	8.62
Phosphorus (total)	mg/L	0.003	0.01	0.014	0.026
Lead (total)	mg/L	0.00001	0.001	0.00012	0.00015
Zinc (total)	mg/L	0.002	0.02	< 0.002	< 0.002



FINAL REPORT

CA14877-OCT19 R

Client: GHD
Project: 11192449-01, Stoney Lake Landfill
Project Manager: Gus Bolin
Samplers: Gus Bolin

PACKAGE: PWQO - Other (ORP) (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result
Other (ORP)					
pH	no unit	0.05	8.5	8.17	7.82
Chloride	mg/L	1		24	22
Mercury (total)	µg/L	0.01	0.2	< 0.01	< 0.01

PACKAGE: PWQO - Phenols (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result
Phenols					
4AAP-Phenolics	mg/L	0.001	0.001	< 0.001	0.003



EXCEEDANCE SUMMARY

				PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E L1
Parameter	Method	Units	Result	

SW-1

Phosphorous	SM 3030/EPA 200.8	µg/L	0.014	0.01
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SW-8

Phosphorous	SM 3030/EPA 200.8	µg/L	0.026	0.01
4AAP-Phenolics	SM 5530B-D	mg/L	0.003	0.001



FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-~~ENV~~IEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0527-OCT19	mg/L as CaCO3	2	< 2	1	10	95	80	120	NA		
Alkalinity	EWL0543-OCT19	mg/L as CaCO3	2	< 2	1	10	103	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-~~ENV~~ISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0266-OCT19	as N mg/L	0.1	<0.1	6	10	99	90	110	99	75	125



FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0023-NOV19	mg/L	1	<1	1	20	96	80	120	96	75	125
Sulphate	DIO0023-NOV19	mg/L	2	<2	1	20	101	80	120	105	75	125
Sulphate	DIO0039-NOV19	mg/L	2	<2	2	20	105	80	120	103	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0605-OCT19	mg/L	0.03	<0.03	ND	20	100	80	120	85	75	125
Nitrate (as N)	DIO0605-OCT19	mg/L	0.06	<0.06	0	20	101	80	120	109	75	125



FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0054-OCT19	mg/L	2	< 2	4	30	93	70	130	89	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0554-OCT19	mg/L	8	<8	ND	20	96	80	120	99	75	125

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0527-OCT19	uS/cm	2	3	2	10	99	90	110	NA		
Conductivity	EWL0543-OCT19	uS/cm	2	< 2	3	10	99	90	110	NA		



FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

Mercury by CVAAS
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0035-OCT19	ug/L	0.01	<0.01	ND	20	97	80	120	112	70	130



FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (total)	EMS0194-OCT19	mg/L	0.0002	<0.0002	ND	20	100	90	110	95	70	130
Barium (total)	EMS0194-OCT19	mg/L	0.00002	<0.00002	5	20	99	90	110	72	70	130
Boron (total)	EMS0194-OCT19	mg/L	0.002	<0.002	ND	20	96	90	110	NV	70	130
Calcium (total)	EMS0194-OCT19	mg/L	0.01	<0.01	2	20	96	90	110	113	70	130
Cadmium (total)	EMS0194-OCT19	mg/L	0.000003	<0.000003	ND	20	100	90	110	91	70	130
Chromium (total)	EMS0194-OCT19	mg/L	0.00008	<0.00008	9	20	103	90	110	NV	70	130
Copper (total)	EMS0194-OCT19	mg/L	0.0002	<0.0002	2	20	99	90	110	98	70	130
Iron (total)	EMS0194-OCT19	mg/L	0.007	<0.007	2	20	97	90	110	NV	70	130
Potassium (total)	EMS0194-OCT19	mg/L	0.009	<0.009	0	20	97	90	110	106	70	130
Magnesium (total)	EMS0194-OCT19	mg/L	0.001	<0.001	2	20	102	90	110	78	70	130
Manganese (total)	EMS0194-OCT19	mg/L	0.00001	<0.00001	4	20	98	90	110	94	70	130
Sodium (total)	EMS0194-OCT19	mg/L	0.01	<0.01	0	20	107	90	110	NV	70	130
Lead (total)	EMS0194-OCT19	mg/L	0.00001	<0.00001	ND	20	98	90	110	106	70	130
Phosphorus (total)	EMS0194-OCT19	mg/L	0.003	<0.003	ND	20	98	90	110	NV	70	130
Zinc (total)	EMS0194-OCT19	mg/L	0.002	<0.002	ND	20	105	90	110	118	70	130



FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

pH
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0527-OCT19	no unit	0.05	NA	0		100			NA		
pH	EWL0543-OCT19	no unit	0.05	NA	1		100			NA		

Phenols by SFA
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0004-NOV19	mg/L	0.001	<0.001	7	10	109	90	110	107	75	125

Solids Analysis
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0521-OCT19	mg/L	30	<30	1	20	105	90	110	NA		



FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0526-OCT19	mg/L	2	< 2	2	10	NV	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0279-OCT19	as N mg/L	0.5	<0.5	1	10	94	90	110	106	75	125

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

This report must not be reproduced, except in full. This report supersedes all previous versions.

-- End of Analytical Report --

Appendix F

Monitoring and Screening Checklist

Appendix D-Monitoring and Screening Checklist

General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.

Instructions: A complete checklist consists of:

- (a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
- (b) completed contact information for the Competent Environmental Practitioner (CEP)
- (c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

- (a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
- (b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

Definition of Surface water CEP:

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site Name	Stoney Lake Road Transfer Station
Location (e.g. street address, lot, concession)	Part Lot 21, Concession 4, Township of Douro-Dummer (Douro), County of Peterborough
GPS Location (taken within the property boundary at front gate/ front entry)	17 782228E 444585N
Municipality	Township of Douro-Dummer
Client and/or Site Owner	Corporation of the Township of Douro-Dummer
Monitoring Period (Year)	2019
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval Number:	Provisional Certificate of Approval A340901
Director's Order No.:	N/A
Provincial Officer's Order No.:	N/A
Other:	N/A

Report Submission Frequency	<input checked="" type="radio"/> Annual <input type="radio"/> Other	Specify (Type Here):	
The site is: (Operation Status)	<input type="radio"/> Open <input type="radio"/> Inactive <input checked="" type="radio"/> Closed		
Does your Site have a Total Approved Capacity?	<input type="radio"/> Yes <input checked="" type="radio"/> No		
If yes, please specify Total Approved Capacity		Units	
Does your Site have a Maximum Approved Fill Rate?	<input type="radio"/> Yes <input checked="" type="radio"/> No		
If yes, please specify Maximum Approved Fill Rate		Units	
Total Waste Received within Monitoring Period (Year)		Units	
Total Waste Received within Monitoring Period (Year) <i>Methodology</i>			
Estimated Remaining Capacity		Units	
Estimated Remaining Capacity <i>Methodology</i>			
Estimated Remaining Capacity <i>Date Last Determined</i>	Select Date		
Non-Hazardous Approved Waste Types	<input checked="" type="checkbox"/> Domestic <input checked="" type="checkbox"/> Industrial, Commercial & Institutional (IC&I) <input type="checkbox"/> Source Separated Organics (Green Bin) <input checked="" type="checkbox"/> Tires	<input type="checkbox"/> Contaminated Soil <input checked="" type="checkbox"/> Wood Waste <input type="checkbox"/> Blue Box Material <input type="checkbox"/> Processed Organics <input type="checkbox"/> Leaf and Yard Waste	<input type="checkbox"/> Food Processing/Preparation Operations Waste <input type="checkbox"/> Hauled Sewage Other: <div>Provide any other approved waste types not listed here</div>
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial <i>(separate waste classes by comma)</i>			
Year Site Opened <i>(enter the Calendar Year <u>only</u>)</i>	1977	Current ECA Issue Date	9-Jun-16
Is your Site required to submit Financial Assurance?	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Describe how your Landfill is designed.	<input checked="" type="radio"/> Natural Attenuation only <input type="radio"/> Fully engineered Facility <input type="radio"/> Partially engineered Facility		
Does your Site have an approved Contaminant Attenuation Zone?	<input type="radio"/> Yes <input checked="" type="radio"/> No		

If closed, specify C of A, control or authorizing document closure date:	22-May-96
Has the nature of the operations at the site changed during this monitoring period?	<div><input type="radio"/> Yes</div> <div><input checked="" type="radio"/> No</div>
If yes, provide details:	Type Here
Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)	<div><input type="radio"/> Yes</div> <div><input checked="" type="radio"/> No</div>

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

<p>1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, list exceptions (Type Here):</p>	
<p>2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document (s):</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>If no, list exceptions below or attach information.</p>	
Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date	
<p>Type Here</p>	<p>Type Here</p>	<p>Select Date</p>	
<p>Type Here</p>	<p>Type Here</p>	<p>Select Date</p>	
<p>Type Here</p>	<p>Type Here</p>	<p>Select Date</p>	
<p>Type Here</p>	<p>Type Here</p>	<p>Select Date</p>	

3) a) Is landfill gas being monitored or controlled at the site?		<input checked="" type="radio"/> Yes <input type="radio"/> No	
If yes to 3(a), please answer the next two questions below.			
b) Have any measurements been taken since the last reporting period that indicate landfill gas is present in the subsurface at levels exceeding criteria established for the site?		<input type="radio"/> Yes <input checked="" type="radio"/> No	
c) Has the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:		<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Applicable	If no, list exceptions below or attach additional information.
Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
4) All field work for groundwater investigations was done in accordance with standard operating procedures as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):		<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, specify (Type Here):

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<p>5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, the potential design and operational concerns/exceptions are as follows (Type Here):</p>	
<p>6) The site meets compliance and assessment criteria.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, list and explain exceptions (Type Here):</p>	
<p>7) The site continues to perform as anticipated. There have been no unusual trends/changes in measured leachate and groundwater levels or concentrations.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, list exceptions and explain reason for increase/change (Type Here):</p>	
<p>1) Is one or more of the following risk reduction practices in place at the site:</p> <p>(a) There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/treatment; or</p> <p>(b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or</p> <p>(c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation):</p> <p><i>i.</i> The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and</p> <p><i>ii.</i> Seasonal and annual water levels and water quality fluctuations are well understood.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>Note which practice(s):</p>	<p><input type="checkbox"/> (a)</p> <p><input type="checkbox"/> (b)</p> <p><input checked="" type="checkbox"/> (c)</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here):</p>	

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.



If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

10-Mar-20

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

<p><input type="radio"/> No changes to the monitoring program are recommended</p> <p><input checked="" type="radio"/> The following change(s) to the monitoring program is/are recommended:</p>	<p>The monitoring of Landfill Gases (methane) through existing groundwater monitors (four new installations completed in 2014) and two gas probes (installations completed in 2014) should be continued at twice per year during the designated spring and fall groundwater sampling campaigns.</p>
<p><input checked="" type="radio"/> No Changes to site design and operation are recommended</p> <p><input type="radio"/> The following change(s) to the site design and operation is/are recommended:</p>	<p>Type Here</p>

Name:	Nyle McIlveen, P.Eng.		
Seal:	Add Image 		
Signature:		Date: Mar 10-20	10-Mar-20
CEP Contact Information:	Nyle McIlveen, P./Eng.		
Company:	GHD		
Address:	347 Pido Road, Unit 29, Peterborough, Ontario K9J 6X7		
Telephone No.:	(705) 749-3317	Fax No. :	(705) 749-9248
E-mail Address:	nyle.mcilveen@ghd.com		
Co-signers for additional expertise provided:			
Signature:		Date:	
Signature:		Date:	Select Date

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):

Name (s)	Sawer Creek, Otonabee River (Trent Canal)
Distance(s)	0.3 and 7 km, respectively

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, identify issues (Type Here):
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable):	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable (No C of A, authorizing / control document applies)	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry C of A or authorizing/control document.		<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Not Applicable	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:		<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Applicable	If no, specify below or provide details in an attachment.
Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
4) All field work for surface water investigations was done in accordance with standard operating procedures, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):		<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, specify (Type Here):

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):

☐ Yes

☒ No

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table below or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. C of A limit, PWQO, background	e.g. X% above PWQO
Iron	PWQO 0.3 uS/cm Background monitor was dry during the sampling period that experienced the exceedance at the receiving water body.	Exceedance (2.97 uS/cm) was only one time in the summer. Samples taken in the spring and fall were within the PWQO.
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	<input checked="" type="radio"/> Yes <input type="radio"/> No	If yes, specify (Type Here)

<p>7) All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, list parameters and stations that is outside the expected range. Identify whether parameter concentrations show an increasing trend or are within a high historical range (Type Here)</p>
<p>8) For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g. , PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Known</p> <p><input type="radio"/> Not Applicable</p>	<p>Groundwater at monitoring well TW 6-2 is the closest monitor to the surface water receiver. It experienced one exceedance of the PWQO for Boron in the spring but not in the fall sampling circuit. Boron values in the receiving surface water location were well within the PWQO and similar to previous years. We believe this result to be an anomaly.</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here)</p>

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended) and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

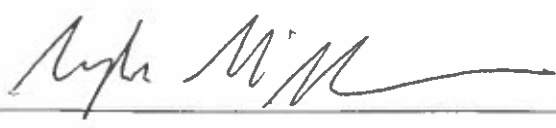
If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

22-Mar-18

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

<p><input type="radio"/> No Changes to the monitoring program are recommended</p> <p><input checked="" type="radio"/> The following change(s) to the monitoring program is/are recommended:</p>	<p>If the background shallow groundwater monitor continues to be dry, it is recommended that the monitor be replaced.</p>
<p><input checked="" type="radio"/> No changes to the site design and operation are recommended</p> <p><input type="radio"/> The following change(s) to the site design and operation is/are recommended:</p>	<p>Type Here</p>

CEP Signature		
Relevant Discipline	Civil engineering, hydrogeology	
Date:	10-Mar-20	
CEP Contact Information:	Nyle McIlveen, P.Eng.	
Company:	GHD	
Address:	347 Pido Road, Unit 29, Peterborough, Ontario K9J 6X7	
Telephone No.:	(705) 749-3317	
Fax No. :	(705) 749-9248	
E-mail Address:	nyle.mcilveen@ghd.com	
Save As		Print Form