Land Use Compatibility Study

Lot 14, Concession 3
Township of Douro-Dummer,
County of Peterborough

D.M. Wills Project Number 20-85104

D.M. Wills Associates Limited
Partners in Engineering, Planning and Environmental Services
Peterborough

January 2022

Prepared for:
Peter and Wendy Smith

WILLS

Summary of Revisions

Revision No.	Revision Title	Date of Release	Summary of Revisions
0	Draft Report	December 23, 2021	Draft Submission for Client Review and Comment
1	Final Report	January 5, 2022	Final Submission to Client

This report has been formatted considering the requirements of the Accessibility for Ontarians with Disabilities Act.

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1.0 Introduction

D.M. Wills Associates Limited (Wills) was retained by Peter and Wendy Smith (Client) to complete a Land Use Compatibility Study (Study) in support of a Consent to Sever (severance) application for the property located at 1090 4th Line Road South, Lot 14, Concession 3 (Subject Property) in the Township of Douro-Dummer (Township) in Peterborough County (County). The Subject Property is approximately 81.6 hectares (ha). The proposed severance includes one (1) approximately 0.6 ha parcel (Proposed Severed Parcel) that will be used for residential purposes. The remainder of the Subject Property (Proposed Retained Parcel) is approximately 81 ha.

Wills understands that the County's Planning Department completed a Preliminary Severance Review on December 14, 2020, and identified policy non-conformities with the Growth Plan for the Greater Golden Horseshoe (Growth Plan), 2019, Peterborough County Official Plan, and Township of Douro-Dummer Official Plan.

The non-conformities include the Subject Property's proximity (within 500 metres [m]) to a closed waste disposal site (WDS), which triggered the requirement for the completion of a Land Use Compatibility Study. The closed WDS is located at Lot 15, Concession 3 in the Township of Douro-Dummer, and is approximately 270 m southwest of the Proposed Severed Parcel.

2.0 Purpose and Scope

Wills' Study was completed to satisfy the policies in *Section 6.2.18.3 (e)* of the Township of Douro-Dummer Official Plan. The Study was conducted on the basis of the Township of Douro-Dummer *Policy No. D-1, Development of Lands in Proximity to Closed Landfill Sites* and the Ministry of the Environment, Conservation and Parks (MECP) *Guideline D-4, Land Use on or Near Landfills and Dumps* (Guideline D-4). The Study evaluated any potential impacts on the Proposed Severed Parcel as a result of the closed WDS. Wills' scope of work to complete the Study included the following:

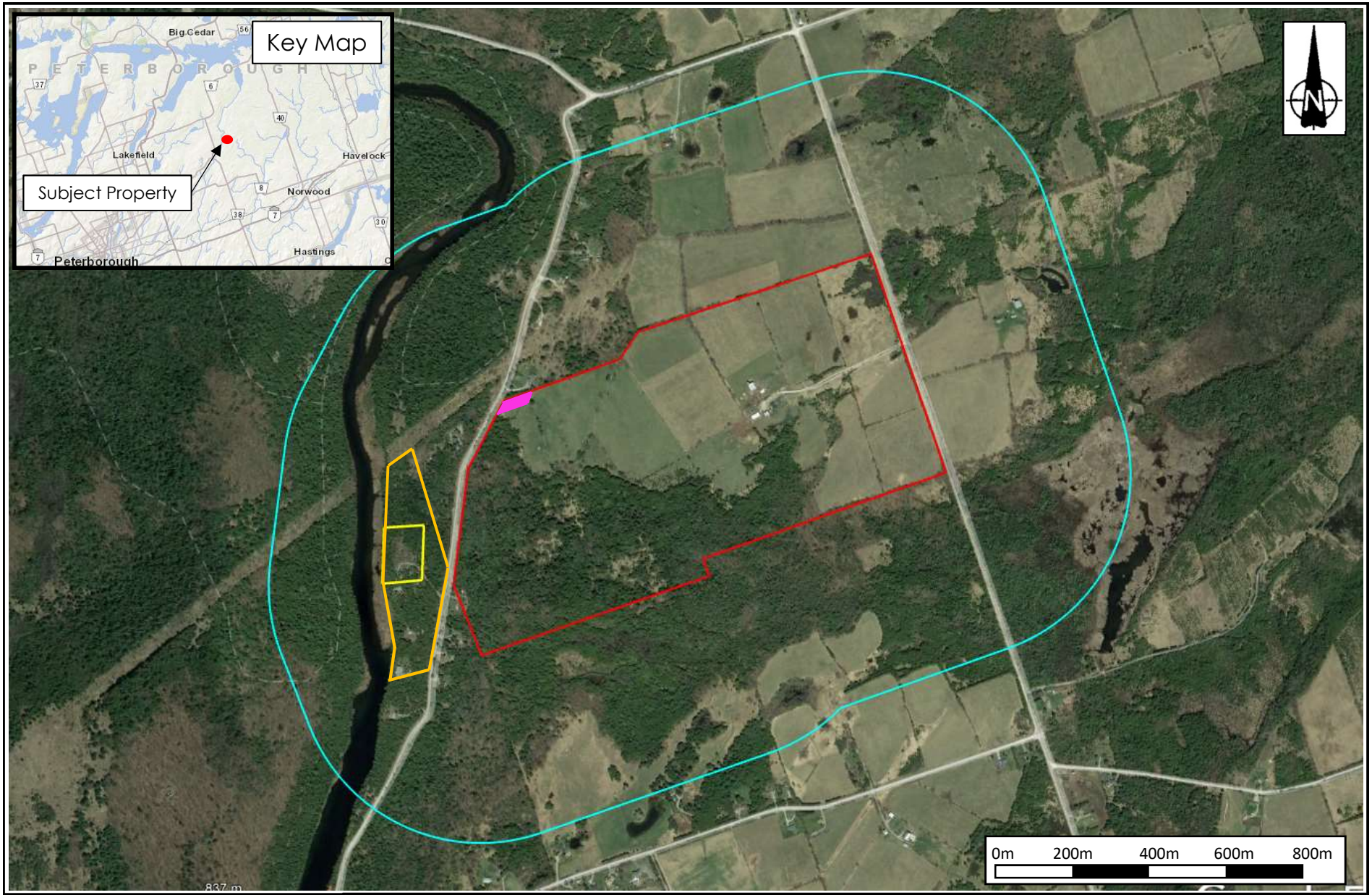
- On the basis of the Guideline D-4 requirements, a desktop review of WDS records is required. *Wills submitted an information request to the Township, the County, and the MECP in an attempt to obtain relevant records pertaining to the operations of the WDS. No records were available for the closed WDS located at Lot 15, Concession 3, as described in the Preliminary Severance Review for the Subject Property;*
- A site reconnaissance was conducted to confirm existing conditions on the Subject Property, specifically the Proposed Severed Parcel, and any potential impacts associated with the closed WDS with respect to Guideline D-4;
- An Ontario Regulation (O. Reg.) 903 Water Supply Well was installed on the Subject Property by the Client to facilitate groundwater sampling and landfill gas monitoring;
- Two (2) groundwater samples were collected from the O. Reg. 903 water supply well to determine groundwater quality on the Proposed Severed Parcel. The groundwater samples were collected during monitoring events conducted in June and October of

2021. Groundwater samples were analysed by SGS Canada Inc. for parameters selected on the basis of the Township of Douro-Dummer *Policy No. D-1, Development of Lands in Proximity to Closed Landfill Sites.* Groundwater analytical results were compared against the Ontario Drinking Water Quality Standards (ODWQS); and,

- Landfill gas monitoring was conducted during the June and October 2021 monitoring events using an RKI Instruments Eagle 2 gas detector.

3.0 Subject Property Description

The Subject Property is approximately 81.6 ha, irregular in shape, and is currently developed with one (1) dwelling, one (1) barn, and several accessory structures. The Subject Property maintains a mix of pasturelands (approximately 50%) and wooded areas (approximately 50%). The Proposed Severed Parcel is approximately 0.6 ha, currently undeveloped, and is located on the northwest corner of the Subject Property. A Subject Property Plan showing the Proposed Severed Parcel and WDS location is included as **Figure 1.**



Legend

- Subject Property
- 500 meter Buffer
- Approximate boundary of WDS
- Footprint of waste materials
- Proposed Severed Parcel

Subject Property Plan

Land Use Compatibility Study
Lot 14, Concession 3
Township of Douro-Dummer, ON

WILLS

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Drawn By IM	Scale See scale bar
Checked	Date August, 2021
Project No. 20-85104	Drawing File No. Figure 1

4.0 Review of Background Information

Wills submitted a request for information to the MECP, the County, and the Township for documentation related to the WDS. Although the WDS is identified on the Township's Official Plan and planning documents, all parties were unable to provide any formal record or documentation related to the WDS, including Annual Monitoring Reports, Environmental Compliance Approvals or Operation Records. Wills was unable to locate any readily available records or documents pertaining the WDS, and a result, could not conduct a background information review of the WDS.

4.1 MECP Water Well Record Survey

Wills completed a database review and desktop evaluation of MECP Well Records within 500 m of the Subject Property to provide a preliminary characterization of the local hydrogeological conditions. Within the search area, eight (8) domestic well records were identified, and all wells were screened within the underlying limestone bedrock. The results of the MECP Well Record Survey are summarized in Error! Reference source not found..

Table 1 – MECP Well Records: Well Construction Summary

	Bedrock
Number of Wells	8
Total Depth Range	12.2 – 35.1 mbg
Average Depth	21.6 mbg
Static Water Level Range	0.6 – 20.7 mbg
Average Static Water Level	7.6 mbg
Recommended Pumping Rate	1 - 20 gpm
Average Recommended Pumping Rate	5.7 gpm

*mbg (metres below ground), gpm (gallons per minute)

Pertinent information including MECP Well ID, well depth, depth to encountered groundwater, static groundwater level, recommended pumping rate, depth to bedrock, and general comments on water quality are summarized and included as **APP-A1** in **Appendix A**. An MECP Well Location Plan is included as **APP-A2** in **Appendix A**, and shows the location of the surveyed wells with respect to the Subject Property.

4.1.1 Groundwater Conditions

Static groundwater elevations and flow direction in the vicinity of the Subject Property were inferred using the MECP well record information and published topographic mapping data obtained from the Ontario Ministry of Natural Resources and Forestry

"Make a Topographic Map" application. Based on the available records, groundwater is anticipated to generally flow southwest towards Quarry Lake in the vicinity of the Subject Property. Static water levels and inferred groundwater elevations are summarized d in **Table 2** below. The MECP Well Location Plan, including interpreted groundwater flow direction is included as **APP-A2** in **Appendix A**.

Table 2 – Groundwater Conditions

Well ID	Location in relation to Subject Property	Approximate Elevation (masl)	Static Water Level (mbg)	Interpreted Groundwater Elevation (masl)
5116951	Subject Property	257	0.61	256.39
5110557	Up-gradient	255	4.57	250.43
5115953	Up-gradient	255	5.49	249.51
7297260	Up-gradient	255	6.16	248.84
7315662	Up-gradient	250	1.52	248.48
7155126	Up-gradient	246	4.08	241.92
A302204	Subject Property	244	17.37	226.63
7051685	Down-gradient	240	20.72	219.28

Hydraulic gradients were calculated by triangulating the three outermost wells within the MECP Water Well Record Survey. The steepest hydraulic gradient was 0.07 (east to west) as measured between Well ID# 5116951 (on Subject Property, east of the Proposed Severed Parcel) to Well ID# 7051685 (west of Subject Property). The second steepest hydraulic gradient was 0.06 (north-northeast to south-southwest) as measured between Well #5115953 (north of Subject Property) and Well ID# 7051685 (east of Subject Property). Based on the two (2) comparable gradients, it is inferred that the hydraulic gradient is generally to the southwest. It should be noted that the static groundwater levels were obtained from historic well records (not recorded on the same date), and groundwater elevations were inferred from relatively low-resolution topographic mapping. Groundwater flow calculations are not expected to very precise, however, do support a southwest flow direction, which generally coincides with the natural topographic gradient towards Quarry Lake.

Based on this information, the Subject Property is inferred to be hydrogeologically up-gradient from the WDS, and any potential contaminants arising from the historic WDSs are expected to flow down-gradient towards Quarry Lake, away from the Subject Property and Proposed Severed Parcel.

5.0 Site Reconnaissance

Wills staff conducted a site reconnaissance on the Subject Property and surrounding area on June 24, 2021. The site reconnaissance was conducted to determine existing conditions and to identify any potential impacts associated with the WDS.

In addition to investigating the Subject Property (specifically the Proposed Severed Parcel), a hydro corridor to the north of the Subject Property was traversed into the WDS area for further observation. Due to private property restrictions, the full extent of the WDS footprint could not be investigated. A photo log documenting the findings of the site reconnaissance are included in **Appendix B**. The site reconnaissance observations are summarized as follows:

Subject Property

- The Subject Property is topographically upgradient of the WDS, and is characterized by undulating hills. The Proposed Severed Parcel maintains a relatively consistent grade from west to east towards Rock Road, and a local topographic high was observed directly east of the Proposed Severed Parcel.
- Surface water features on the Subject Property were limited to a roadside drainage ditch that extends along Rock Road. Surface water runoff from the Subject Property is expected to be intercepted by this ditch, however, the topography on the southern margin of the Subject Property likely discharges surface water to the south towards adjacent wetland areas.
- The Subject Property is currently used as pastureland for cattle and is primarily open grassland. The Proposed Severed Parcel is bordered to the north and east by hedgerows, and a mixed conifer and deciduous forest extends along the south and west portion of the Subject Property. There was no evidence of stressed vegetation or other indicators of landfill impacts.
- The surrounding land use appears to be a mix of agricultural and rural residential.

Historic Waste Disposal Site

- The east-west topographic gradient extends east of Subject Property towards Quarry Lake to the west, and the WDS. The gradient steepens proximal to Quarry Lake, where exposed limestone shelves are present. Exposed limestone is visible at surface along the hydro corridor and in the vicinity of the historic WDS.
- The WDS is situated in a mixed forest. During the site reconnaissance, there was no evidence of stressed vegetation, and in view of the shallow bedrock conditions, waste was likely never buried on the property.
- Evidence of dumping was found to the west of a small clearing, proximal to the north property boundary of 1074 Rock Road. Dumping appeared to be concentrated on the steep slope to the west, proximal to Quarry Lake. Observed waste materials included metal wire, automobile bodies, cans, car tires, drums, and appliances. The exact waste limits were not determined due to site access restrictions.

6.0 Environmental Monitoring

6.1 Groundwater Quality

Groundwater quality on the Proposed Severed Parcel was assessed during two (2) monitoring events completed on June 24, 2021 (completed in parallel with the site reconnaissance) and on October 27, 2021.

Prior to groundwater sampling, three (3) well volumes were purged from a new O. Reg. 903 Water Supply Well (MECP Tag A302204, "Well A302204") that was installed by the Client on the Proposed Severed Parcel. Groundwater purging was conducted using a submersible pump to ensure representative groundwater sample collection, and approximately 1,000 litres of water was purged prior to sample collection during each monitoring event.

One (1) groundwater sample set was collected from Well A302204 during each monitoring event. The sample was collected in dedicated sample bottles, kept in a cooler with ice and transported to SGS Canada Inc. (an accredited analytical laboratory) in Lakefield, Ontario, immediately following completion of the field activities. Groundwater samples were submitted for analysis of select parameters provided in the Township of Douro-Dummer *Policy No. D-1, Development of Lands in Proximity to Closed Landfill Sites*. Laboratory analytical results were compared against the ODWQS and are summarized in **Table 3.** Certificates of Analysis from SGS are included in **Appendix C.**

Table 3 – Summary of Groundwater Quality

Parameter	ODWQS			
	Spring 2021	Fall 2021	MAC*	AO/OG*
Biochemical Oxygen Demand (BOD5), (mg/L)	< 4	< 4	-	30-500
Alkalinity (mg/L as CaCO3)	256	280		
Bicarbonate (mg/L as CaCO3)	256	280	-	-
Carbonate (mg/L as CaCO3)	< 2	< 2	-	-
OH (mg/L as CaCO3)	< 2	< 2	-	-
Colour (TCU)	3	< 3	-	5
Conductivity (uS/cm)	547	597	-	-
pH	7.87	7.98	-	6.5-8.5
Turbidity (NTU)	**16.2**	**5.39**	1	5
Ammonia+Ammonium (N) (as N mg/L)	0.07	0.13	-	-
Total Kjeldahl Nitrogen (as N mg/L)	< 0.5	0.16		
Phosphorus (total reactive) (mg/L)	< 0.03	< 0.03	-	-
Total Organic Carbon (mg/L)	1	1	-	-
Chloride (mg/L)	14	11	-	250
Fluoride (mg/L)	0.19	0.16	1.5	-
Bromide (mg/L)	< 0.05	0.06	-	-
Nitrite (as N) (as N mg/L)	0.014	0.025	1	-
Nitrate (as N)	0.510	1.34	10	-
Sulphate (mg/L)	21	23	-	500
Mercury (µg/L)	< 0.01	< 0.01	1	-
Hardness (mg/L as CaCO3)	**314**	**343**	-	80-100
Aluminum (µg/L)	52	13	-	100
Arsenic (µg/L)	< 0.2	< 0.2	10	-
Boron (µg/L)	39	46	5000	-
Barium (µg/L)	87.4	78.1	1000	-
Beryllium (µg/L)	0.015	< 0.007	-	-
Cobalt (µg/L)	0.520	0.097	-	-
Calcium (mg/L)	117	128	-	-
Cadmium (µg/L)	< 0.003	0.003	5	-
Copper (µg/L)	0.7	0.2	-	1000
Chromium (µg/L)	0.29	< 0.08	50	-

Parameter	ODWQS			
	Spring 2021	Fall 2021	MAC*	AO/OG*
Iron (µg/L)	**2720**	**733**	-	300
Potassium (mg/L)	1.57	1.66	-	-
Magnesium (mg/L)	5.52	5.77	-	-
Manganese (µg/L)	42.4	20.3	-	50
Molybdenum (µg/L)	1.02	6.50	-	-
Nickel (µg/L)	1.1	0.4	-	-
Sodium (mg/L)	10.0	12.4	20*	200
Phosphorus (mg/L)	0.003	0.005	-	-
Lead (µg/L)	0.65	0.09	10	-
Silicon (µg/L)	4250	3620	-	-
Silver (µg/L)	< 0.05	< 0.05	-	-
Strontium (µg/L)	2250	3050	-	-
Thallium (µg/L)	0.041	0.014	-	-
Tin (µg/L)	0.12	< 0.06	-	-
Titanium (µg/L)	1.61	0.52	-	-
Antimony (µg/L)	< 0.9	< 0.6	6	-
Selenium (µg/L)	< 0.04	< 0.04	50	-
Uranium (µg/L)	0.347	0.376	20	-
Vanadium (µg/L)	0.17	0.05	-	-
Zinc (µg/L)	2	3	-	5000
Cation sum (meq/L)	6.98	7.56	-	-
Anion Sum (meq/L)	5.96	5.93	-	-
Anion-Cation Balance (% difference)	7.86	12.1	-	-
Ion Ratio	1.17	1.28	-	-
Total Dissolved Solids (calculated) (mg/L)	323	328	-	-
Conductivity (calculated) (uS/cm)	647	675	-	-
Langeliers Index 4° C	0.39	0.58	-	-
Saturation pH 4°C	7.48	7.40	-	-

Notes:

(<) indicates levels that are below the detectable limits. Bolded values exceed their applicable AO/OG in ODWQS. Bolded and shaded values exceed their applicable MAC in ODWQS.

AO – Aesthetic Objective OG – Operational Guidelines MAC – Maximum Acceptable Concentration

The results from the June and October 2021 monitoring events indicate good overall water quality on the Proposed Severed Parcel with respect to the ODWQS. Exceedances for turbidity, hardness, and iron were observed during both monitoring events, however, are ODWQS operational and aesthetic guideline parameters that are commonly found in exceedance within bedrock wells in the St. Lawrence Lowlands region. This is owing to the nature of the underlying limestone bedrock, and is not associated with landfill leachate.

6.2 Landfill Gas Monitoring Results

Landfill gas monitoring was conducted during the June and October 2021 monitoring events using an RKI Instruments *Eagle 2* gas detector.

The results of the landfill gas monitoring indicate no significant concentrations of landfill gases are presenting gas on the Proposed Severed Parcel. The results of the landfill gas monitoring are included in **Table 4.**

Table 4 – Landfill Gas Monitoring Results

Parameter	Monitoring Results	
	June 2021	October 2021
Hexane (ppm)	0	0
Isobutylene (ppm)	2	0

ppm – parts per million

The 2 ppm isobutylene measurement recorded in June 2021 is considered anomalous, and was not detected during the October 2021 monitoring event. Based on the low concentration, it is possible that this reading may be a result from material (e.g. solvent) that was present on the well materials during well construction/handling, although this cannot be confirmed.

Based on the location of the WDS, the limited extent of waste materials, and the distal and down-gradient location from the Proposed Severed Parcel, it is highly unlikely that these historic activities resulted in landfill gas generation that could be detected on the Proposed Severed Parcel.

7.0 Conclusions and Recommendations

Based on the findings of Wills' Study, the following conclusions are provided:

- Based on the MECP Well Records Survey, it is anticipated that the Subject Property and Proposed Severed Parcel are located hydrologically upgradient from the closed WDS. Hydraulic gradients calculated between O. Reg. 903 water supply wells proximal to the Subject property suggest a southwest groundwater flow direction towards Quarry Lake.

- During the site reconnaissance, no evidence of landfill impacts were found on the Subject Property. In addition, there was no evidence of formal waste disposal within the investigated WDS area, although some informal dumping of waste materials were observed to have taken place approximately 500 m southwest of the Proposed Severed Parcel.
- Waste disposal appears to have been limited to a small area directly adjacent to Quarry Lake. The extent of waste disposal is likely limited to that which was observed at surface, as the shallow overburden and exposed bedrock would have precluded waste burial.
- Results of the June and October 2021 monitoring events indicate good groundwater quality on the Subject Property with respect to the ODWQS. Exceedances for iron, turbidity, and hardness are not expected to be associated with landfill leachate impacts from the WDS, and are commonly encountered in groundwater samples collected from limestone bedrock aquifers.
- No negative impacts on the Proposed Severed Parcel are anticipated as a result of the WDS on the basis on the limited amount of waste, groundwater and gas monitoring results, and the distal and down-gradient location of the WDS with respect to the Subject Property and Proposed Severed Parcel.
- Wills concludes that the Study satisfies the policies in *Section 6.2.18.3 (e)* of the Township of Douro-Dummer Official Plan, and it is our opinion that the findings of this report support the Client's severance application.

We trust that the information contained in and attached to this report meet your current needs. The following Statement of Limitations should be read carefully and is an integral part of this report. Do not hesitate to contact the undersigned if you have any questions or concerns.

Respectfully submitted,

Prepared by: _____
Lynsey Tuters, B.A., C. Tech
Environmental Project Technologist

Reviewed by: _____
Ian Ames, M.Sc., P.Geo.
Environmental Monitoring and Management Lead

LT/IA/avg

8.0 Statement of Limitations

This report is intended solely for the Peter and Wendy Smith (Client) in assessing impacts resulting from a historic WDS at the property identified as the 1090 4th Line Road South, Lot 14, Concession 3 (Subject Property) in the Township of Douro-Dummer, in Peterborough County, and is prohibited for use by others without Wills' prior written consent. This report is considered Wills' professional work product and shall remain the sole property of D.M. Wills Associates Limited. Any unauthorized reuse, redistribution of or reliance on this report shall be at the Client and recipient's sole risk, without liability to Wills. The Client shall defend, indemnify and hold Wills harmless from any liability arising from or related to the Client's unauthorized distribution of the report. No portion of this report may be used as a separate entity; it is to be read in its entirety and shall include supporting drawings and appendices.

The recommendations made in this report are based on Wills' present understanding of the Project, the current and proposed site use, ground and subsurface conditions at the time of the field investigation, and are based on the work scope approved by the Client and described in the report. The services were performed in a manner consistent with the level of care and skill ordinarily exercised by members of geoscience or engineering professions currently practicing under similar conditions in the same locality. No other representations, and no warranties or representations of any kind, either expressed or implied, are made. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the sole responsibility of such third parties.

Groundwater conditions between and beyond the test locations may differ both horizontally and vertically from those encountered at the test locations. Should any conditions on the Subject Property be encountered which differ from those found at the test locations, the recommendations in this report shall be considered invalid until sufficient review and written assessment of said conditions by Wills is completed.

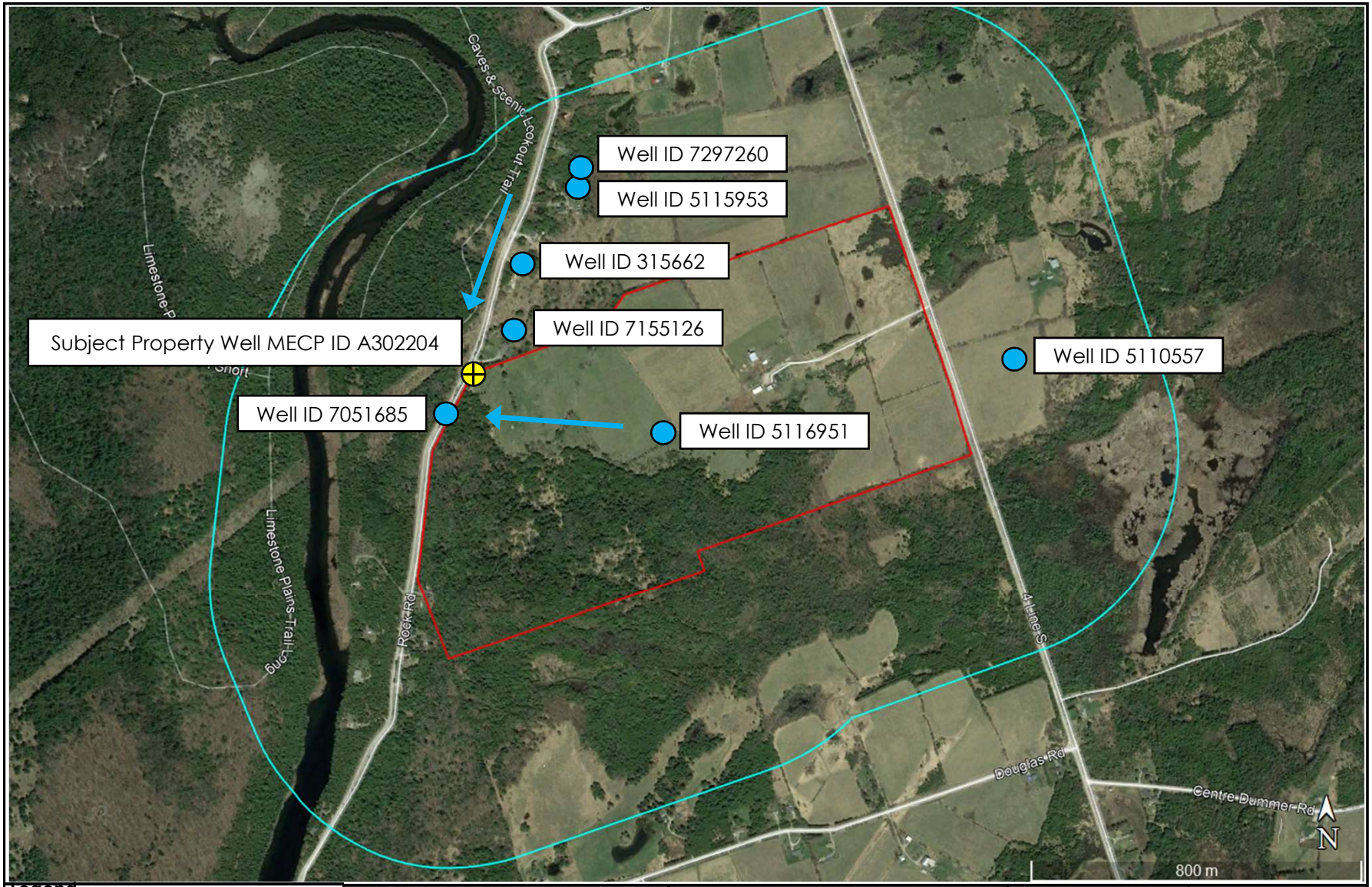
Appendix A

MECP Well Record Survey

Land Use Compatibility Study: MECP Well Record Search Data
Lot 14, Concession 3, Township of Douro-Dummer, County of Peterborough

Well ID	Easting	Northing	Well Classification	Bedrock depth (mbg)	Total depth (mbg)	Static Water Level (mbg)	Recommended Pumping rate (gpm)	Depth to Water
5115953	_	_	Domestic	3.05	23.16	5.49	2	5.49
7297260	729596	4926672	Domestic	3.35	20.42	6.16	3	3.35
7315662	729463	4926487	Domestic	3.35	12.19	1.52	10	6.4
7155126	729445	4926329	Domestic	6.10	16.76	4.08	3.5	6.71
7051685	729292	4926125	Domestic	1.22	31.10	20.72	4	25.09
5118801	_	_	Domestic	0	35.05	17.37	20	35.05
5116951	_	_	Domestic	4.88	18.29	0.61	2	5.49
5110557	_	4926300	Domestic	9.14	15.54	4.57	1	9.75

Summary	
Average recommended pumping rate:	5.69
Average depth:	21.56
Average depth to bedrock:	3.89
Average depth to water:	12.17
Average static water level:	7.57



Legend

- Subject Property
- 500 Metre Buffer
- Subject Property Well Location
- MECP Well Locations
- Inferred groundwater flow

Well Location Plan

Land Use Compatibility Study
Lot 14, Concession 3
Township of Douro-Dummer, ON

WILLS

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Drawn By HW	Scale See scale bar
Checked	Date December 2021
Project No. 20-85104	Drawing File No. APP-A1

Appendix B

Photographs

Client Name: Peter and Wendy Smith	**Site Location:** 1090 4th Line Road South

Photograph No.: 1
Date: June 24, 2021
Direction: North
Description: Drinking water well on Subject Property (Proposed Severed Parcel).

Photograph No.: 2
Date: June 24, 2021
Direction: North-east
Description: Drinking water well on Subject Property (Proposed Severed Parcel).

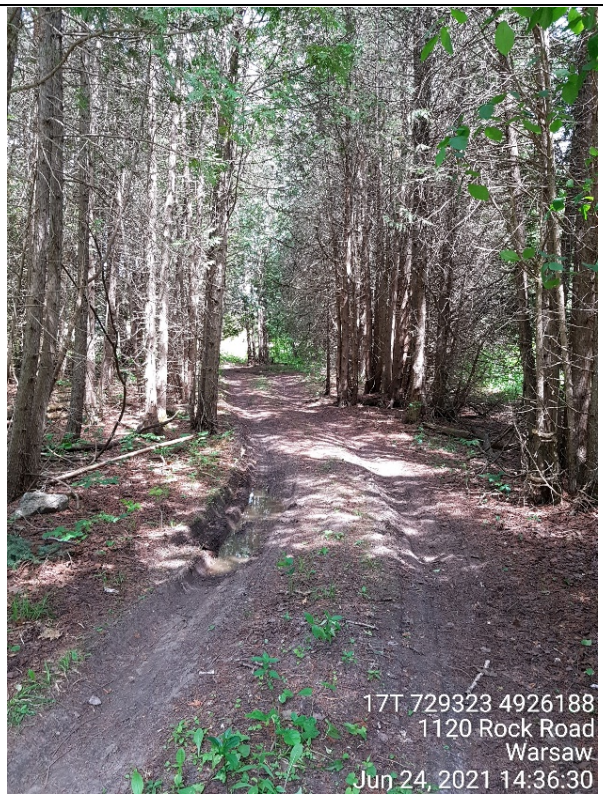
Photograph No.: 3
Date: June 24, 2021
Direction: East
Description: View towards the eastern boundary of the Proposed Severed Parcel.

Photograph No.: 4
Date: June 24, 2021
Direction: North
Description: View towards tree line along the northern property boundary the of Proposed Severed Parcel.

Photograph No.: 5
Date: June 24, 2021
Direction: West
Description: View towards mixed conifer and deciduous tree line along the western boundary of the Proposed Severed Parcel.

Photograph No.: 6
Date: June 24, 2021
Direction: South
Description: View to the south of the Proposed Severed Parcel across open pasture land and mixed forest.

Photograph No.: 7
Date: June 24, 2021
Direction: East
Description: Access to the Proposed Severed Parcel from Rock Road.



Photograph No.: 8
Date: June 24, 2021
Direction: North
Description: View along Rock Road west of the Proposed Severed Parcel. Drainage ditch at roadside flows south before discharging through a culvert under the right of way towards the west.

Photograph No.: 9
Date: June 24, 2021
Direction: South
Description: View along Rock Road west of the Proposed Severed Parcel. Drainage ditch discharges under the right of way to the west.

Photograph No.: 10
Date: June 24, 2021
Direction: South-west
Description: View along hydro corridor to the northwest of the Subject Property. Quarry Lake in depression beyond first tower.

Photograph No.: 11
Date: June 24, 2021
Direction: North
Description: Exposed bedrock along hydro corridor.

Photograph No.: 12
Date: June 24, 2021
Direction: North
Description: Limestone bedrock boulders near WDS, located between Rock Road and Quarry Lake.

Photograph No.: 13
Date: June 24, 2021
Direction: North East
Description: Historic dumping within WDS footprint.

Photograph No.: 14
Date: June 24, 2021
Direction: East
Description: Historic dumping within WDS footprint.

Photograph No.: 15
Date: June 24, 2021
Direction: East
Description: Historic dumping within WDS footprint.

Photograph No.: 16
Date: June 24, 2021
Direction: East
Description: Historic dumping within WDS footprint.

Appendix C

Certificates of Analysis - Groundwater

FINAL REPORT

CA14490-OCT21 R1

85104

Prepared for

D.M. Wills -Peterborough

FINAL REPORT

CA14490-OCT21 R1

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	D.M. Wills -Peterborough	Project Specialist	Maarit Wolfe, Hon.B.Sc
		Laboratory	SGS Canada Inc.
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Contact	Lynsey Tuters	Telephone	705-652-2000
Telephone	289-385-6230	Facsimile	705-652-6365
Facsimile	705-741-3568	Email	Maarit.Wolfe@sgs.com
Email	ltuters@dmwills.com	SGS Reference	CA14490-OCT21
Project	85104	Received	10/27/2021
Order Number		Approved	11/03/2021
Samples	Ground Water (1)	Report Number	CA14490-OCT21 R1
		Date Reported	11/03/2021

COMMENTS

MAC - Maximum Acceptable Concentration
AO/OG - Aesthetic Objective / Operational Guideline
NR - Not reportable under applicable Provincial drinking water regulations as per client.

Temperature of Sample upon Receipt: 13 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:023199

SIGNATORIES

Maarit Wolfe, Hon.B.Sc

TABLE OF CONTENTS

Client: D.M. Wills -Peterborough
Project: 85104
Project Manager: Lynsey Tuters
Samplers: L. Tuters

PACKAGE: **ODWS_AO_OG - General Chemistry** (WATER)

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

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	7
Sample Name	85104-DW-01-10 -27-2021
Sample Matrix	Ground Water
Sample Date	27/10/2021

General Chemistry

Parameter	Units	RL	L1	L2	Result
Biochemical Oxygen Demand (BOD5)	mg/L	2			< 4↑
Alkalinity	mg/L as CaCO3	2	500		280
Bicarbonate	mg/L as CaCO3	2			280
Carbonate	mg/L as CaCO3	2			< 2
OH	mg/L as CaCO3	2			< 2
Colour	TCU	3	5		< 3
Conductivity	uS/cm	2			597
Turbidity	NTU	0.10	5	1	5.39
Ammonia+Ammonium (N)	as N mg/L	0.04			0.13
Total Kjeldahl Nitrogen (N)	as N mg/L	0.05			0.16
Phosphorus (total reactive)	mg/L	0.03			< 0.03
Total Organic Carbon	mg/L	1			1

FINAL REPORT

CA14490-OCT21 R1

Client: D.M. Wills -Peterborough
Project: 85104
Project Manager: Lynsey Tuters
Samplers: L. Tuters

PACKAGE: **ODWS_AO_OG - Metals and Inorganics** (WATER)

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

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	7
Sample Name	85104-DW-01-10 -27-2021
Sample Matrix	Ground Water
Sample Date	27/10/2021

Metals and Inorganics

Parameter	Units	RL	L1	L2	Result
Fluoride	mg/L	0.06		1.5	0.16
Bromide	mg/L	0.05			0.06
Nitrite (as N)	as N mg/L	0.003		1	0.025
Nitrate (as N)	as N mg/L	0.006		10	1.34
Sulphate	mg/L	0.04	500		23
Mercury	µg/L	0.01		1	< 0.01
Hardness	mg/L as CaCO3	0.05	100		343
Aluminum	µg/L	1	100		13
Arsenic	µg/L	0.2		10	< 0.2
Boron	µg/L	2		5000	46
Barium	µg/L	0.02		1000	78.1
Beryllium	µg/L	0.007			< 0.007
Cobalt	µg/L	0.004			0.097
Calcium	mg/L	0.01			128
Cadmium	µg/L	0.003		5	0.003
Copper	µg/L	0.2	1000		0.2
Chromium	µg/L	0.08		50	< 0.08
Iron	ug/L	7	300		733
Potassium	mg/L	0.009			1.66
Magnesium	mg/L	0.001			5.77
Manganese	µg/L	0.01	50		20.3

Client: D.M. Wills -Peterborough
Project: 85104
Project Manager: Lynsey Tuters
Samplers: L. Tuters

PACKAGE: **ODWS_AO_OG - Metals and Inorganics** (WATER)

Sample Number 7

Sample Name 85104-DW-01-10 -27-2021

Sample Matrix Ground Water

Sample Date 27/10/2021

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

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Metals and Inorganics (continued)

Parameter	Units	RL	L1	L2	Result
Molybdenum	µg/L	0.04			6.50
Nickel	µg/L	0.1			0.4
Sodium	mg/L	0.01	200	20	12.4
Phosphorus	mg/L	0.003			0.005
Lead	µg/L	0.01		10	0.09
Silicon	ug/L	20			3620
Silver	µg/L	0.05			< 0.05
Strontium	µg/L	0.02			3050
Thallium	µg/L	0.005			0.014
Tin	µg/L	0.06			< 0.06
Titanium	ug/L	0.05			0.52
Antimony	µg/L	0.6		6	< 0.6
Selenium	µg/L	0.04		50	< 0.04
Uranium	µg/L	0.002		20	0.376
Vanadium	µg/L	0.01			0.05
Zinc	µg/L	2	5000		3

Client: D.M. Wills -Peterborough
Project: 85104
Project Manager: Lynsey Tuters
Samplers: L. Tuters

PACKAGE: **ODWS_AO_OG - Other (ORP)**
(WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03
L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

	Sample Number	7
	Sample Name	85104-DW-01-10 -27-2021
	Sample Matrix	Ground Water
	Sample Date	27/10/2021

Parameter	Units	RL	L1	L2	Result
Other (ORP)					
pH	No unit	5	8.5		7.98
Chloride	mg/L	0.04	250		11

PACKAGE: **ODWS_MAC - General Chemistry**
(WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03
L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

	Sample Number	7
	Sample Name	85104-DW-01-10 -27-2021
	Sample Matrix	Ground Water
	Sample Date	27/10/2021

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Biochemical Oxygen Demand (BOD5)	mg/L	2			< 4 ↑
Alkalinity	mg/L as CaCO3	2	500		280
Bicarbonate	mg/L as CaCO3	2			280
Carbonate	mg/L as CaCO3	2			< 2
OH	mg/L as CaCO3	2			< 2
Colour	TCU	3	5		< 3
Conductivity	uS/cm	2			597

Client: D.M. Wills -Peterborough
Project: 85104
Project Manager: Lynsey Tuters
Samplers: L. Tuters

PACKAGE: **ODWS_MAC - General Chemistry**
(WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03
L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	7
Sample Name	85104-DW-01-10 -27-2021
Sample Matrix	Ground Water
Sample Date	27/10/2021

Parameter	Units	RL	L1	L2	Result
General Chemistry (continued)					
Turbidity	NTU	0.10	5	1	5.39
Ammonia+Ammonium (N)	as N mg/L	0.04			0.13
Total Kjeldahl Nitrogen (N)	as N mg/L	0.05			0.16
Phosphorus (total reactive)	mg/L	0.03			< 0.03
Total Organic Carbon	mg/L	1			1

PACKAGE: **ODWS_MAC - Metals and Inorganics**
(WATER)

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03
L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	7
Sample Name	85104-DW-01-10 -27-2021
Sample Matrix	Ground Water
Sample Date	27/10/2021

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics					
Fluoride	mg/L	0.06		1.5	0.16
Bromide	mg/L	0.05			0.06
Nitrite (as N)	as N mg/L	0.003		1	0.025
Nitrate (as N)	as N mg/L	0.006		10	1.34
Sulphate	mg/L	0.04	500		23
Mercury	µg/L	0.01		1	< 0.01
Hardness	mg/L as CaCO3	0.05	100		343

Client: D.M. Wills -Peterborough
Project: 85104
Project Manager: Lynsey Tuters
Samplers: L. Tuters

PACKAGE: **ODWS_MAC - Metals and Inorganics**
(WATER)

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

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	7
Sample Name	85104-DW-01-10 -27-2021
Sample Matrix	Ground Water
Sample Date	27/10/2021

Metals and Inorganics (continued)

Parameter	Units	RL	L1	L2	Result
Aluminum	µg/L	1	100		13
Arsenic	µg/L	0.2		10	< 0.2
Boron	µg/L	2		5000	46
Barium	µg/L	0.02		1000	78.1
Beryllium	µg/L	0.007			< 0.007
Cobalt	µg/L	0.004			0.097
Calcium	mg/L	0.01			128
Cadmium	µg/L	0.003		5	0.003
Copper	µg/L	0.2	1000		0.2
Chromium	µg/L	0.08		50	< 0.08
Iron	ug/L	7	300		733
Potassium	mg/L	0.009			1.66
Magnesium	mg/L	0.001			5.77
Manganese	µg/L	0.01	50		20.3
Molybdenum	µg/L	0.04			6.50
Nickel	µg/L	0.1			0.4
Sodium	mg/L	0.01	200	20	12.4
Phosphorus	mg/L	0.003			0.005
Lead	µg/L	0.01		10	0.09
Silicon	ug/L	20			3620
Silver	µg/L	0.05			< 0.05
Strontium	µg/L	0.02			3050

Client: D.M. Wills -Peterborough
Project: 85104
Project Manager: Lynsey Tuters
Samplers: L. Tuters

PACKAGE: **ODWS_MAC - Metals and Inorganics**
(WATER)

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

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	7
Sample Name	85104-DW-01-10 -27-2021
Sample Matrix	Ground Water
Sample Date	27/10/2021

Metals and Inorganics (continued)

Parameter	Units	RL	L1	L2	Result
Thallium	µg/L	0.005			0.014
Tin	µg/L	0.06			< 0.06
Titanium	ug/L	0.05			0.52
Antimony	µg/L	0.6		6	< 0.6
Selenium	µg/L	0.04		50	< 0.04
Uranium	µg/L	0.002		20	0.376
Vanadium	µg/L	0.01			0.05
Zinc	µg/L	2	5000		3

Client: D.M. Wills -Peterborough

Project: 85104

Project Manager: Lynsey Tuters

Samplers: L. Tuters

PACKAGE: **ODWS_MAC - Other (ORP)** (WATER)

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

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	7
Sample Name	85104-DW-01-10-27-2021
Sample Matrix	Ground Water
Sample Date	27/10/2021

Parameter	Units	RL	L1	L2	Result
Other (ORP)					
pH	No unit	5	8.5		7.98
Chloride	mg/L	0.04	250		11

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03 L1	ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03 L2
85104-DW-01-10-27-2021					
Turbidity	SM 2130	NTU	5.39	5	1
Hardness	SM 3030/EPA 200.8	mg/L	343	100	
Iron	SM 3030/EPA 200.8	µg/L	733	300	

QC SUMMARY

QCR_SubCategory

Method: SM 2130 | Internal ref.: ME-CA-[ENV]EWL-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
Turbidity	EWL0615-OCT21	NTU	0.10	< 0.10	3	10	97	90	110	NA		

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-[ENV]EWL-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	EWL0638-OCT21	mg/L as CaCO3	2	< 2	1	20	102	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-[ENV]SFA-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)	SKA0305-OCT21	mg/L	0.04	<0.04	8	10	106	90	110	100	75	125

QC SUMMARY

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
Bromide	DIO0618-OCT21	mg/L	0.05	<0.05	ND	20	104	90	110	110	75	125
Nitrite (as N)	DIO0618-OCT21	mg/L	0.003	<0.003	11	20	99	90	110	95	75	125
Nitrate (as N)	DIO0618-OCT21	mg/L	0.006	<0.006	0	20	102	90	110	95	75	125
Chloride	DIO0619-OCT21	mg/L	0.04	<0.04	NV	20	101	90	110	NV	75	125
Sulphate	DIO0636-OCT21	mg/L	0.04	<0.04	1	20	99	90	110	106	75	125

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)	BOD0053-OCT21	mg/L	2	< 2	3	30	90	70	130	NV	70	130

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
Total Organic Carbon	SKA0309-OCT21	mg/L	1	<1	0	10	104	90	110	106	75	125

Carbonate/Bicarbonate

Method: SM 2320 | Internal ref.: ME-CA-[ENV]EWL-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
Carbonate	EWL0638-OCT21	mg/L as CaCO3	2	< 2	ND	10	NA	90	110	NA		
Bicarbonate	EWL0638-OCT21	mg/L as CaCO3	2	< 2	1	10	NA	90	110	NA		
OH	EWL0638-OCT21	mg/L as CaCO3	2	< 2	ND	10	NA	90	110	NA		

QC SUMMARY

Colour

Method: SM 2120 I Internal ref.: ME-CA-IENVIEWL-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
Colour	EWL0624-OCT21	TCU	3	< 3	ND	10	100	80	120	NA		

Conductivity

Method: SM 2510 I 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	EWL0638-OCT21	uS/cm	2	< 2	0	20	99	90	110	NA		

Flouride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-014

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
Fluoride	EWL0623-OCT21	mg/L	0.06	<0.06	5	10	100	90	110	96	75	125

QC SUMMARY

Mercury by CVAAS

Method: SM3112/EPA 245 | 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	EHG0039-OCT21	ug/L	0.01	< 0.01	ND	20	93	80	120	109	70	130

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
Silver	EMS0007-NOV21	ug/L	0.05	<0.00005	ND	20	105	90	110	106	70	130
Aluminum	EMS0007-NOV21	ug/L	1	<0.001	3	20	100	90	110	90	70	130
Arsenic	EMS0007-NOV21	ug/L	0.2	<0.0002	0	20	104	90	110	109	70	130
Barium	EMS0007-NOV21	ug/L	0.02	< 0.01	0	20	105	90	110	100	70	130
Beryllium	EMS0007-NOV21	ug/L	0.007	<0.00007	ND	20	92	90	110	76	70	130
Boron	EMS0007-NOV21	ug/L	2	<0.002	1	20	102	90	110	101	70	130
Calcium	EMS0007-NOV21	mg/L	0.01	<0.01	0	20	106	90	110	111	70	130
Cadmium	EMS0007-NOV21	ug/L	0.003	<0.000003	13	20	104	90	110	119	70	130
Cobalt	EMS0007-NOV21	ug/L	0.004	<0.000004	1	20	104	90	110	102	70	130
Chromium	EMS0007-NOV21	ug/L	0.08	<0.00008	ND	20	105	90	110	126	70	130
Copper	EMS0007-NOV21	ug/L	0.2	<0.0002	0	20	102	90	110	107	70	130
Iron	EMS0007-NOV21	ug/L	7	<0.007	2	20	107	90	110	125	70	130
Potassium	EMS0007-NOV21	mg/L	0.009	<0.009	1	20	107	90	110	115	70	130
Magnesium	EMS0007-NOV21	mg/L	0.001	<0.001	2	20	105	90	110	71	70	130
Manganese	EMS0007-NOV21	ug/L	0.01	<0.00001	2	20	103	90	110	73	70	130
Molybdenum	EMS0007-NOV21	ug/L	0.04	<0.00004	1	20	105	90	110	101	70	130
Sodium	EMS0007-NOV21	mg/L	0.01	<0.01	3	20	102	90	110	105	70	130
Nickel	EMS0007-NOV21	ug/L	0.1	<0.0001	2	20	102	90	110	108	70	130
Lead	EMS0007-NOV21	ug/L	0.01	<0.00001	9	20	107	90	110	101	70	130
Phosphorus	EMS0007-NOV21	mg/L	0.003	<0.003	ND	20	100	90	110	NV	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-[ENV]SPE-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
Antimony	EMS0007-NOV21	ug/L	0.6	<0.0009	1	20	104	90	110	98	70	130
Selenium	EMS0007-NOV21	ug/L	0.04	<0.00004	7	20	102	90	110	105	70	130
Silicon	EMS0007-NOV21	ug/L	20	<0.02	3	20	95	90	110	NV	70	130
Tin	EMS0007-NOV21	ug/L	0.06	<0.00006	0	20	107	90	110	NV	70	130
Strontium	EMS0007-NOV21	ug/L	0.02	<0.00002	0	20	100	90	110	104	70	130
Titanium	EMS0007-NOV21	ug/L	0.05	<0.00005	3	20	105	90	110	NV	70	130
Thallium	EMS0007-NOV21	ug/L	0.005	<0.000005	ND	20	104	90	110	101	70	130
Uranium	EMS0007-NOV21	ug/L	0.002	<0.000002	1	20	102	90	110	90	70	130
Vanadium	EMS0007-NOV21	ug/L	0.01	<0.00001	7	20	104	90	110	115	70	130
Zinc	EMS0007-NOV21	ug/L	2	<0.002	ND	20	101	90	110	100	70	130

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-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	EWL0638-OCT21	No unit	5	NA	0		100			NA		

QC SUMMARY

Reactive Phosphorus by SFA

Method: SM 4500-P F | Internal ref.: ME-CA-[ENV]SFA-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
Phosphorus (total reactive)	SKA0301-OCT21	mg/L	0.03	<0.03	ND	10	102	90	110	NV	75	125

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-[ENV]SFA-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 (N)	SKA0306-OCT21	mg/L	0.05	<0.05	1	10	107	90	110	118	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 --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 023199 Page ____ of ____

Laboratory Information Section - Lab use only

Received By: Emily Laurence | Received By (signature): Emily
Received Date: OCT 27 2021 (mm/dd/yy) | Custody Seal Present: Yes ☑ No ☐ | Cooling Agent Present: Yes ☑ No ☐ Type: ice
Received Time: 14 : 55 (hr : min) | Custody Seal Intact: Yes ☑ No ☐ | Temperature Upon Receipt (°C) 12.13.13 | LAB LIMS #: CA-14490-Oct21

REPORT INFORMATION

Company: D.M. Wills
Contact: Lynsey Tulers
Address: 150 Jameson Dr. Peterborough, ON K9J 0B9
Phone: 289-385-6230
Fax:
Email: ltulers@dmwills.com

INVOICE INFORMATION

☑ (same as Report Information)
Company:
Contact:
Address:
Phone:
Email: accounts@dmwills.com

Quotation #:
P.O. #: 85104
Project #: 85104
Site Location/ID: 1090 4th Line Douro

TURNAROUND TIME (TAT) REQUIRED

☑ Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

***NOTE:** DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table ____ Appx. ____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA
☑ ODWS Not Reportable *See note

Sewer By-Law:
☐ Sanitary
☐ Storm
Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	M&I: Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN,Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	SVOC: PAHs only	SVOC: SVOCs (all incl PAHs, ABNs, CPs	PCB: PCBs Aroclor ☐ Total ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX	VOC: VOCs (all incl BTEX	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other	Other: As per guide, General chemistry	Other	Other	Other	Sewer Use: (Specify pkg:)	Water Characterization Pkg: General ☐ Extended ☐	SPLP: Specify tests	TCLP: Specify tests	COMMENTS:
1	B5104-DW01-10-27-2021	Oct 27/2021	14:00	18	GW													X								- Parameter list attached.
2	* Both sets are the																									
3	same sample.																									
4	Only analyze one if																									
5	that is all that is																									
6	required.																									
7																										
8																										
9																										
10																										
11																										
12																										

Observations/Comments/Special Instructions

Sampled By (NAME): L. Tulers	**Signature:** L Tulers	Date: Oct / 27 / 2021 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): L. Tulers	**Signature:** L Tulers	Date: Oct / 27 / 2021 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.5
Date of Issue: 11 June 2021

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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Phone: 705-652-2000 FAX: 705-652-6365

Project : 85104

05-July-2021

D.M. Wills -Peterborough
Attn : Amanda Tse

150 Jameson Drive
Peterborough, ON
K9J 0B9, Canada

Phone: 289-385-3286
Fax:705-741-3568

Date Rec. : 24 June 2021
LR Report: **CA14406-JUN21**
Reference: 85104, Amanda Tse

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MAC	6: AO/OG	7: 85104-A302204-2021-06-24
Sample Date & Time							24-Jun-21 13:06
Temp Upon Receipt [°C]	---	---	---	---	---	---	10.0
BOD5 [mg/L]	24-Jun-21	16:46	29-Jun-21	13:32	---	30-500	< 4
Alkalinity [mg/L as CaCO3]	25-Jun-21	08:21	05-Jul-21	11:01			256
HCO3 [mg/L as CaCO3]	25-Jun-21	08:21	02-Jul-21	09:56	---	---	256
CO3 [mg/L as CaCO3]	25-Jun-21	08:21	02-Jul-21	09:56	---	---	< 2
OH [mg/L as CaCO3]	25-Jun-21	08:21	02-Jul-21	09:56	---	---	< 2
Colour [TCU]	30-Jun-21	14:22	02-Jul-21	13:37	---	5	3
Conductivity [uS/cm]	25-Jun-21	08:21	02-Jul-21	09:56	---	---	547
pH [No unit]	25-Jun-21	08:21	02-Jul-21	09:56	---	6.5-8.5	7.87
Turbidity [NTU]	25-Jun-21	11:37	25-Jun-21	12:00	1	5	16.2*
NH3+NH4 [as N mg/L]	44376	0.76	30-Jun-21	14:10	---	---	0.07
TKN [as N mg/L]	29-Jun-21	15:11	02-Jul-21	16:56			< 0.5
Tot.Reactive P [mg/L]	25-Jun-21	08:46	25-Jun-21	18:07	---	---	< 0.03
TOC [mg/L]	25-Jun-21	10:34	28-Jun-21	14:48	---	---	1
Cl [mg/L]	26-Jun-21	09:47	28-Jun-21	13:15	---	250	14
F [mg/L]	28-Jun-21	08:31	28-Jun-21	14:29	1.5	---	0.19
Br [mg/L]	26-Jun-21	09:31	28-Jun-21	13:39	---	---	< 0.05
NO2 [as N mg/L]	26-Jun-21	09:31	28-Jun-21	13:39	1	---	0.014
NO3 [as N mg/L]	26-Jun-21	09:31	28-Jun-21	13:39	10	---	0.510
SO4 [mg/L]	26-Jun-21	09:47	28-Jun-21	13:15	---	500	21

OnLine LIMS

00025252900

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Project : 85104
LR Report : **CA14406-JUN21**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MAC	6: AO/OG	7: 85104-A302204-2021-06-24
Hg [µg/L]	25-Jun-21	16:00	29-Jun-21	09:33	1	---	< 0.01
Hardness [mg/L as CaCO3]	30-Jun-21	09:42	02-Jul-21	16:30	---	80-100	314*
Al [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	100	52
As [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	10	---	< 0.2
B [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	5000	---	39
Ba [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	1000	---	87.4
Be [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	0.015
Co [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	0.520
Ca [mg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	117
Cd [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	5	---	< 0.003
Cu [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	1000	0.7
Cr [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	50	---	0.29
Fe [ug/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	300	2720*
K [mg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	1.57
Mg [mg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	5.52
Mn [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	50	42.4
Mo [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	1.02
Ni [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	1.1
Na [mg/L]	30-Jun-21	09:42	02-Jul-21	16:30	20*	200	10.0
P [mg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	0.003
Pb [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	10	---	0.65
Si [ug/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	4250
Ag [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	< 0.05
Sr [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	2250
Tl [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	0.041
Sn [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	0.12
Ti [ug/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	1.61
Sb [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	6	---	< 0.9
Se [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	50	---	< 0.04
U [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	20	---	0.347
V [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	---	0.17
Zn [µg/L]	30-Jun-21	09:42	02-Jul-21	16:30	---	5000	2
Cation Sum [meq/L]	05-Jul-21	---	05-Jul-21	---	---	---	6.98
Anion Sum [meq/L]	05-Jul-21	---	05-Jul-21	---	---	---	5.96
Anion-Cation Balance [% difference]	05-Jul-21	---	05-Jul-21	---	---	---	7.86
Ion Ratio	05-Jul-21	---	05-Jul-21	---	---	---	1.17
TDS (calculated) [mg/L]	05-Jul-21	---	05-Jul-21	---	---	---	323
Conductivity (calc) [uS/cm]	05-Jul-21	---	05-Jul-21	---	---	---	647

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Project : 85104
LR Report : **CA14406-JUN21**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MAC	6: AO/OG	7: 85104-A302204-2021-06-24
Langelier's Index [@ 4° C]	05-Jul-21	---	05-Jul-21	---	---	---	0.39
Saturation pH [pHs @ 4°C]	05-Jul-21	---	05-Jul-21	---	---	---	7.48
Reactive SiO2 [mg/L]	02-Jul-21	12:13	02-Jul-21	15:04			7.77

MAC - Maximum Acceptable Concentration
AO/OG - Aesthetic Objective / Operational Guideline
NR - Not reportable under applicable Provincial drinking water regulations as per client.

Temperature of Sample upon Receipt: 10 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:022455

Method Descriptions

Parameter	Description	SGS Method Code
Alkalinity	Alkalinity by Titration	ME-CA-[ENV]EWL-LAK-AN-006
Aluminum	Aluminum by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Ammonia+Ammonium (N)	NH3+NH4 by Skalar - drinking water to MDL	ME-CA-[ENV]SFA-LAK-AN-007
Anion Sum	Calculation-Anion Sum	
Anion-Cation Balance	Calculation-Anion-Cation Balance	
Antimony	Antimony by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Arsenic	Arsenic by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Barium	Barium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Beryllium	Beryllium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Bicarbonate	Bicarbonate by Titration	ME-CA-[ENV]EWL-LAK-AN-006
Biochemical Oxygen Demand (BOD5)	Biochemical Oxygen Demand (BOD5)	ME-CA-[ENV]EWL-LAK-AN-007
Boron	Boron by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Bromide	Bromide by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
Cadmium	Cadmium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Calcium	Calcium by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
Carbonate	Carbonate by Titration	ME-CA-[ENV]EWL-LAK-AN-006
Cation sum	Calculation-Cation Sum	
Chloride	Chloride by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001

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Project : 85104
LR Report : **CA14406-JUN21**

Parameter	Description	SGS Method Code
Chromium	Chromium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Cobalt	Cobalt by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Colour	True Colour by colourmetric method	ME-CA-[ENV]EWL-LAK-AN-002
Conductivity	Conductivity by Conductivity Meter	ME-CA-[ENV]EWL-LAK-AN-006
Conductivity (calculated)	Calculation-Conductivity	
Copper	Copper by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Fluoride	Fluoride by specific ion electrode	ME-CA-[ENV]EWL-LAK-AN-014
Hardness	Hardness (CaCO3) by ICP	ME-CA-[ENV]SPE-LAK-AN-003
Ion Ratio	Calculation-Ion Ratio	
Iron	Iron by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
Langeliers Index 4° C	Calculation-Langelier's Index 4°C	
Lead	Lead by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Magnesium	Magnesium by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
Manganese	Manganese by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Mercury	Hg drinking water by CVAAS	ME-CA-[ENV]SPE-LAK-AN-004
Molybdenum	Molybdenum by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Nickel	Nickel by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Nitrate (as N)	Nitrate by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
Nitrite (as N)	Nitrite by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
OH	OH by titration	ME-CA-[ENV]EWL-LAK-AN-006
pH	pH - solution	ME-CA-[ENV]EWL-LAK-AN-006
Phosphorus	Phosphorus by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
Phosphorus (total reactive)	Tot. Reactive Phos. by Skalar or Spec.- no reagents or heat	ME-CA-[ENV]SFA-LAK-AN-004
Potassium	Potassium by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
Reactive Silica	Reactive Silica by Colourmetry	
Saturation pH 4°C	Calculation-Saturation pH 4°C	
Selenium	Selenium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Silicon	Silicon by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
Silver	Silver by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Sodium	Sodium by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006
Strontium	Strontium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Sulphate	Sulphate by Ion Chromatography	ME-CA-[ENV]IC-LAK-AN-001
Thallium	Thallium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Tin	Tin by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Titanium	Titanium by ICP-MS drinking water	ME-CA-[ENV]SPE-LAK-AN-006

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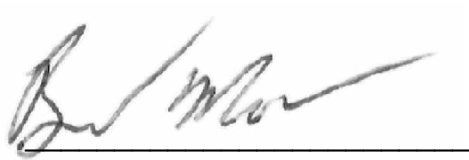
Project : 85104
LR Report : **CA14406-JUN21**

Parameter	Description	SGS Method Code
Total Dissolved Solids (calculated)	Calculation-TDS	
Total Kjeldahl Nitrogen	Tot. kjeldahl Nitrogen by Skalar	ME-CA-[ENV]SFA-LAK-AN-002
Total Organic Carbon	TOC by Skalar	ME-CA-[ENV]SFA-LAK-AN-009
Turbidity	Turbidity - APHA.AWWA.WPCF 18th 2130B	ME-CA-[ENV]EWL-LAK-AN-003
Uranium	Uranium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Vanadium	Vanadium by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006
Zinc	Zinc by ICP-MS Drinking Water	ME-CA-[ENV]SPE-LAK-AN-006



Brad Moore Hon. B.Sc
Project Specialist,
Environment, Health & Safety

OnLine LIMS

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Project : 85104
LR Report : **CA14406-JUN21**

Quality Control Report

Inorganic Analysis													
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material		
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
							%		Low	High		Low	High
**QCR_SubCategory* - QCBatchID: EWL0520-JUN21*													
Turbidity	0.10	NTU	< 0.10			ND	10	99	90	110	NA		
Alkalinity - QCBatchID: EWL0514-JUN21													
Alkalinity	2	mg/L as Ca	< 2			1	20	96	80	120	NA		
Ammonia by SFA - QCBatchID: SKA0291-JUN21													
Ammonia+Ammonium (N)	0.04	mg/L	<0.04			ND	10	96	90	110	95	75	125
Anions by IC - QCBatchID: DIO0466-JUN21													
Bromide	0.05	mg/L	<0.05			ND	20	101	90	110	94	75	125
Nitrate (as N)	0.006	mg/L	<0.006			0	20	99	90	110	100	75	125
Nitrite (as N)	0.003	mg/L	<0.003			ND	20	95	90	110	99	75	125
Anions by IC - QCBatchID: DIO0467-JUN21													
Chloride	0.04	mg/L	<0.04			3	20	101	90	110	93	75	125
Sulphate	0.04	mg/L	<0.04			1	20	98	90	110	91	75	125
Biochemical Oxygen Demand - QCBatchID: BOD0055-JUN21													
Biochemical Oxygen Demand (BOD5)	2	mg/L	< 2			11	30	112	70	130	NV	70	130
Carbon by SFA - QCBatchID: SKA0264-JUN21													
Total Organic Carbon	1	mg/L	<1			ND	10	96	90	110	110	75	125
Carbonate/Bicarbonate - QCBatchID: EWL0514-JUN21													
Bicarbonate	2	mg/L as Ca	< 2			1	10	NA	90	110	NA		
Carbonate	2	mg/L as Ca	< 2			ND	10	NA	90	110	NA		
OH	2	mg/L as Ca	< 2			ND	10	NA	90	110	NA		
Colour - QCBatchID: EWL0592-JUN21													
Colour	3	TCU	< 3			ND	10	105	80	120	NA		
Conductivity - QCBatchID: EWL0514-JUN21													
Conductivity	2	uS/cm	< 2			0	20	99	90	110	NA		
Flouride by Specific Ion Electrode - QCBatchID: EWL0540-JUN21													
Fluoride	0.06	mg/L	<0.06			2	10	100	90	110	89	75	125
Mercury by CVAAS - QCBatchID: EHG0029-JUN21													
Mercury	0.01	ug/L	<0.01			ND	20	93	80	120	109	70	130
Metals in aqueous samples - ICP-MS - QCBatchID: EMS0183-JUN21													
Aluminum	1	ug/L	< 1			0	20	99	90	110	110	70	130
Antimony	0.9	ug/L	<0.0009			0	20	101	90	110	102	70	130
Arsenic	0.2	ug/L	<0.0002			ND	20	102	90	110	92	70	130
Barium	0.02	ug/L	<0.00002			5	20	96	90	110	96	70	130
Beryllium	0.007	ug/L	<0.00007			ND	20	93	90	110	92	70	130
Boron	2	ug/L	<0.002			1	20	102	90	110	90	70	130

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Project : 85104

LR Report : **CA14406-JUN21**

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material		
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
							%		Low	High		Low	High
Cadmium	0.003	ug/L	<0.000003			ND	20	99	90	110	109	70	130
Calcium	0.01	mg/L	<0.01			8	20	99	90	110	96	70	130
Chromium	0.08	ug/L	<0.00008			11	20	102	90	110	106	70	130
Cobalt	0.004	ug/L	<0.000004			13	20	98	90	110	95	70	130
Copper	0.2	ug/L	<0.0002			5	20	97	90	110	99	70	130
Iron	7	ug/L	<0.007			11	20	98	90	110	100	70	130
Lead	0.01	ug/L	<0.00001			4	20	97	90	110	97	70	130
Magnesium	0.001	mg/L	<0.001			1	20	102	90	110	96	70	130
Manganese	0.01	ug/L	<0.00001			3	20	102	90	110	93	70	130
Molybdenum	0.04	ug/L	<0.00004			17	20	100	90	110	95	70	130
Nickel	0.1	ug/L	<0.0001			7	20	97	90	110	89	70	130
Phosphorus	0.003	mg/L	<0.003			4	20	100	90	110	NV	70	130
Potassium	0.009	mg/L	<0.009			3	20	101	90	110	99	70	130
Selenium	0.04	ug/L	<0.00004			ND	20	102	90	110	93	70	130
Silicon	20	ug/L	<0.02			1	20	105	90	110	NV	70	130
Silver	0.05	ug/L	<0.00005			ND	20	98	90	110	88	70	130
Sodium	0.01	mg/L	<0.01			1	20	109	90	110	100	70	130
Strontium	0.02	ug/L	<0.00002			1	20	100	90	110	97	70	130
Thallium	0.005	ug/L	<0.000005			ND	20	100	90	110	104	70	130
Tin	0.06	ug/L	<0.00006			6	20	99	90	110	NV	70	130
Titanium	0.05	ug/L	<0.00005			ND	20	98	90	110	NV	70	130
Uranium	0.002	ug/L	<0.000002			1	20	94	90	110	90	70	130
Vanadium	0.01	ug/L	<0.00001			ND	20	99	90	110	98	70	130
Zinc	2	ug/L	<0.002			2	20	101	90	110	101	70	130
pH - QCBatchID: EWL0514-JUN21													
pH	5	No unit	NA			0		101			NA		
Reactive Phosphorus by SFA - QCBatchID: SKA0257-JUN21													
Phosphorus (total reactive)	0.03	mg/L	<0.03			ND	10	95	90	110	77	75	125
Reactive Silica by Colourmetry - QCBatchID: EWL0012-JUL21													
Reactive Silica	0.02	mg/L	< 0.02			10	10	107	90	110	97	75	125
Total Nitrogen - QCBatchID: SKA0016-JUL21													
Total Kjeldahl Nitrogen	0.5	as N mg/L	<0.5			1	10	99	90	110	97	75	125

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