



EXP Services Inc.

885 Regent Street
Sudbury, Ontario
P3E 5M4

Telephone: (705) 674-9681
Facsimile: (705) 674-8271

March 15, 2024

Alistair Ross
931B Red Deer Lake Road S
Wahnapiatae, City of Greater Sudbury, Ontario
P0M 3C0

Re: Project No. **SUD-24003172-A0**
Water Quality Study for 931B Red Deer Lake S, Wahnapiatae, ON
PIN 73480-0338, Parcel 33112, Part 4-6, Plan 53R-19699, Part 1, Plan SR-1688
& Part 1, Plan SR-2044, Lot 3, Concession 4
City of Greater Sudbury

CGS File #: 751-9/23-04

Dear Mr. Ross:

EXP Services Inc. (EXP) was retained to conduct a water quality assessment at the above noted property (the Site).

EXP attended the Site on March 6, 2024, and collected one (1) water sample from an existing/operational water well located at 931B Red Deer Lake S, in Wahnapiatae, ON. The purpose of EXP's letter is to report water quality results as they relate to parameters outlined by the City of Greater Sudbury Potable Water Policy Analysis Table. It is understood that a water quantity assessment was already conducted at the Site and, as such, an assessment to confirm the water supply can produce 3 gallons per minute for a minimum of 4 hours was not completed as part of this review. A summary of geochemical results for the water well is included in **Table A in Appendix A**. The certificate of analysis provided by SGS Laboratories is included in **Appendix B**.

The water sample was submitted under chain of custody documentation to SGS Laboratories and analyzed for a list of parameters to determine if levels comply with the City of Greater Sudbury's water quality Analysis Table (**Appendix A**).



The results of the geochemical analysis of select parameters were compared to the Ontario Drinking Water Quality Standards/Objectives (ODWS/O) to determine compliance. Overall, no exceedances were noted for maximum allowable concentration (MAC) standards for any tested parameters (including E. Coli and Total Coliform, which were undetectable), while several exceedances were noted for aesthetic and operational objectives.¹ Exceedances of ODWS were noted for **manganese** (83.6 ug/L), **hardness** (1090 mg/L, as CaCO₃), **sodium** (207 mg/L also exceeds conditional ODWS), **chloride** (260 mg/L), **sulphate** (1100 ug/L) and **turbidity** (8.0 NTU). Concentrations were **Not Detected (ND)** for bacterial parameters, while noted concentrations were **below the detectable limit** for nitrate and nitrite, and below the ODWS for arsenic (0.5 ug/L) and lead (0.02 ug/L).

Manganese, chloride, sulphate and turbidity are classified as non-health related aesthetic/operational objectives under the ODWS. The objectives for manganese, chloride and sulphate are 50, 250 and 500 ug/L, respectively, while the objective for turbidity is 5 NTU. The levels of these parameters in the water sample are in the range of domestic water treatment. Water treatment processes may be introduced to condition the groundwater to a suitable quality for these aesthetic/operational parameters.

Sodium is also classified as a non-health related aesthetic objective under the ODWS. The aesthetic objective for sodium is 200 mg/L. An exceedance of 20 mg/L of sodium is identified as a concern to be brought to the attention of a physician if the water consumer is on a sodium restricted diet.

Hardness is classified as a non-health related operational objective under the ODWS. Hardness levels between 80 and 100 mg/L as CaCO₃ are considered to provide an acceptable balance between corrosion and incrustation. Water supplies with a hardness greater than 200 mg/L are considered poor but tolerable for operational purposes. Hardness in excess of 500 mg/L in drinking water is unacceptable for most domestic purposes. Water treatment processes may be introduced to condition the groundwater to a suitable quality for the exceeded operational parameters.

As noted, all ODWS for health-related parameters were within acceptable limits – that is, bacterial parameters were non-detectable and nitrate/nitrite parameters were below the detectable limit. In addition, both arsenic and lead were below applicable ODWS criteria. Note, sodium exceeded conditional ODWS criteria for individuals on sodium-restricted diets. Additional protection against bacterial contaminants could be achieved through standard water treatment systems, such as with UV lighting and chlorination.

Not all of the parameters required for comparison to ODWS/O for drinking water use were tested or analyzed; however, it was tested as per CGS guidelines required for the City of Greater Sudbury Potable Water Policy.

¹ MAC = Maximum Allowable Concentration is a level that has been established for certain substances that are known or expected to cause health effects. AO = Aesthetic Objectives are established for parameters that may impair the taste, smell or colour of water; or which may interfere with the supply of good water quality. OG = Operational Guidelines are set for parameters that may affect processes at a treatment plant or in the drinking water distribution system. The latter two do not cause adverse health effects.



We trust this information is satisfactory for your purposes. If you have any questions or require further information, please contact the undersigned directly.

Sincerely,

EXP Services Inc.

A handwritten signature in black ink, appearing to read "JB", with a long horizontal line extending to the right.

Jamie Batten, GIT.
Project Manager
Earth and Environmental Services

A handwritten signature in blue ink, appearing to read "Delwar", with a long horizontal line extending to the right.

Delwar Ahmed, P. Geo.
Sr. Reviewer/Hydrogeologist
Earth and Environmental Services





Appendix A: Analytical Results of Water Sample

Water Quality Assessment
931B Red Deer Lake Road S, Wahnapiatae, City of Greater Sudbury, ON **SUD-24003172-A0**

Table A: Summary of geochemical results for groundwater collected on March 6, 2023

PARAMETER	RDL	Units	ODWS	Standard/Objective	Res 1
METALS:					
Arsenic	0.2	ug/L	10	MAC	0.5
Iron	7	ug/L	300	AO	53
Manganese	0.01	ug/L	50	AO	83.6
Lead	0.01	ug/L	10	MAC	0.02
Aluminum	1	ug/L	100	OG	2
MAJOR IONS:					
Hardness(as CaCO3) ¹	0.05	mg/L	100	OG	1090
Sodium ²	0.01	mg/L	200/20	AO/MAC	207
Chloride	0.04	mg/L	250	AO	260
Sulphate	0.04	mg/L	500	AO	1100
NITROGENOUS:					
Nitrate (as N)	0.006	mg/L	10	MAC	<0.006
Nitrite (as N)	0.003	mg/L	1	MAC	<0.003
SOLIDS:					
Turbidity	0.10	NTU	5/1	AO/OG	8.0
BACTERIAL:					
E.Coli	0	CFU/100ml	ND	MAC	0
Total Coliform Bacteria	0	CFU/100ml	ND	MAC	0

AO Aesthetic Objective (non-health related)
OG Operational Guideline (non-health related)
MAC Maximum Acceptable Concentration (health-related)

ODWS: Ontario Drinking Water Standards

Shaded Indicates ODWS exceedence

Maximum Allowable Concentration is a level that has been established for certain substances that are known or expected to cause health effects.

Shaded Indicates ODWO exceedence

Aesthetic Objectives are established for parameters that may impair the taste, smell or colour of water; or which may interfere with the supply of good water quality. Operational Guidelines are set for parameters that may affect processes at a treatment plant or in the drinking water distribution system. Both do not cause adverse health effects.

CFU: Colony Forming Units

NTU: Nephelometric Turbidity unit

Notes : ¹ Water supplies with a Hardness greater than 200 mg/L are considered poor but tolerable. Hardness that is greater than 500 mg/L is unacceptable for most domestic purposes.

² The aesthetic objective for sodium in drinking water is 200 mg/L. The Local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.



Appendix B: Certificate of Analysis



FINAL REPORT

CA15720-MAR24 R

SUD-24003172-A0

Prepared for

EXP Services Inc.

First Page

CLIENT DETAILS

LABORATORY DETAILS

Client	EXP Services Inc.	Project Specialist	Jill Campbell, B.Sc.,GISAS
Address	885 Reagent Street, Sudbury Canada, P3E 5M4 Phone: 705-674-9681. Fax:705-674-5583	Laboratory Address	SGS Canada Inc. 185 Concession St., Lakefield ON, K0L 2H0
Contact	Jamie Batten	Telephone	2165
Telephone	705-674-9681	Facsimile	705-652-6365
Facsimile	705-674-5583	Email	jill.campbell@sgs.com
Email	jamie.batten@exp.com; yves.beauparlant@exp.com	SGS Reference	CA15720-MAR24
Project	SUD-24003172-A0	Received	03/07/2024
Order Number		Approved	03/13/2024
Samples	Non-Reportable (1)	Report Number	CA15720-MAR24 R
		Date Reported	03/13/2024

COMMENTS

MAC - Maximum Acceptable Concentration
 AO/OG - Aesthetic Objective / Operational Guideline
 MDL - SGS Method Detection Limit

Temperature of Sample upon Receipt: 9
 Cooling Agent Present: Yes
 Custody Seal Present: Yes
 Chain of Custody Number: 038475

SIGNATORIES

Jill Campbell, B.Sc.,GISAS



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FINAL REPORT

CA15720-MAR24 R

Client: EXP Services Inc.

Project: SUD-24003172-A0

Project Manager: Jamie Batten

Samplers: Shianne Van Duzen

MATRIX: WATER

Sample Number 8

Sample Name RES

Sample Matrix Non-Reportable

Sample Date 06/03/2024

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

Parameter	Units	RL	L1	L2	Result
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General Chemistry

Turbidity	NTU	0.10	5	1	8.0
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Metals and Inorganics

Nitrite (as N)	as N mg/L	0.003		1	0.003#<MDL
Nitrate (as N)	as N mg/L	0.006		10	0.006#<MDL
Nitrate + Nitrite (as N)	as N mg/L	0.006			0.006#<MDL
Sulphate	mg/L	0.04	500		1100
Hardness	mg/L as CaCO3	0.05	100		1090
Aluminum	µg/L	1	100		2
Arsenic	µg/L	0.2		10	0.5
Iron	ug/L	7	300		53
Sodium	mg/L	0.01	200	20	207
Manganese	µg/L	0.01	50		83.6
Lead	µg/L	0.01		10	0.02



FINAL REPORT

CA15720-MAR24 R

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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

Parameter	Units	RL	L1	L2	Result
Microbiology					
E. Coli	cfu/100mL	0		0	0
Total Coliform	cfu/100mL	0		0	0
Other (ORP)					
Chloride	mg/L	0.04	250		260

EXCEEDANCE SUMMARY

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

RES

Chloride	EPA300/MA300-Ions1.3	mg/L	260	250	
Sulphate	EPA300/MA300-Ions1.3	mg/L	1100	500	
Turbidity	SM 2130	NTU	8.0	5	1
Hardness	SM 3030/EPA 200.8	mg/L as CaCO3	1090	100	
Manganese	SM 3030/EPA 200.8	µg/L	83.6	50	
Sodium	SM 3030/EPA 200.8	mg/L	207	200	20

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
Chloride	DIO0200-MAR24	mg/L	0.04	<0.04	4	20	106	90	110	115	75	125
Nitrate + Nitrite (as N)	DIO0205-MAR24	mg/L	0.006	<0.006	NA		NA			NA		
Nitrite (as N)	DIO0205-MAR24	mg/L	0.003	<0.003	1	20	96	90	110	99	75	125
Nitrate (as N)	DIO0205-MAR24	mg/L	0.006	<0.006	0	20	98	90	110	88	75	125
Sulphate	DIO0212-MAR24	mg/L	0.04	<0.04	1	20	93	90	110	97	75	125

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
Aluminum	EMS0095-MAR24	ug/L	1	< 1	1	20	105	90	110	107	70	130
Arsenic	EMS0095-MAR24	ug/L	0.2	< 0.2	ND	20	106	90	110	102	70	130
Iron	EMS0095-MAR24	ug/L	7	< 7	ND	20	103	90	110	100	70	130
Manganese	EMS0095-MAR24	ug/L	0.01	< 0.01	1	20	106	90	110	100	70	130
Sodium	EMS0095-MAR24	mg/L	0.01	< 0.01	0	20	107	90	110	105	70	130
Lead	EMS0095-MAR24	ug/L	0.01	< 0.01	12	20	105	90	110	100	70	130



FINAL REPORT

CA15720-MAR24 R

QC SUMMARY

Microbiology

Method: OMOE MICROMFDC-E3407A | Internal ref.: ME-CA-IENVIMIC-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
E. Coli	BAC9109-MAR24	cfu/100mL	-	ACCEPTED	ACCEPTED							
Total Coliform	BAC9109-MAR24	cfu/100mL	-	ACCEPTED	ACCEPTED							

Turbidity

Method: SM 2130 | Internal ref.: ME-CA-IENVIEWL-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	EWL0132-MAR24	NTU	0.10	< 0.10	0	10	99	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

Results relate only to the sample tested.

Data reported represent the sample as submitted to SGS. 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 and Excess Soil Quality" 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.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

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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. Reproduction of this analytical report in full or in part is prohibited.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

Laboratory Information Section - Lab use only

Received By: Victoria Received By (signature): [Signature] Cooling Agent Present: Yes No Type: ice pack
 Received Date: Mar 07 2024 (mm/dd/yy) Custody Seal Present: Yes No Temperature Upon Receipt (°C) 9 x 3
 Received Time: _____ (hr: min) Custody Seal Inact: Yes No LAB LIMS #: CA-15790-MAR24

REPORT INFORMATION

Company: EXP Services (same as Report Information)
 Contact: Jamie Batten Company: _____
 Address: 885 Regent St Contact: _____
Sudbury Address: _____
 Phone: 705-694-9681 Phone: _____
 Fax: _____ Email: _____

INVOICE INFORMATION

Quotation #: _____
 Project #: TRB
 P.O. #: _____
 Site Location/ID: _____

ANALYSIS REQUESTED

M & I: Metals & Inorganics (incl CrVI, CN, Hg, pH, B(HWS), EC, SAR-soil) (Cl, Na-water)
 Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI)
 ICP Metals only (Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mo, Ni, Se, Ag, Ti, U, V, Zn)
 PAHs only
 SVOCs (all incl PAHs, ABNs, CPs)
 PCBs Total Aroclor
 F1-F4 + BTEX
 F1-F4 only (no BTEX)
 VOCs (all incl BTEX)
 BTEX only
 Pesticides (Organochlorine or specify other)
 Total metals, Turbidity, EC/TC
 Anion (CGS Potability)
 Other (please specify): _____
 Sewer Use: _____
 Water Characterization Pkg: General Extended
 S/PLP tests: Metals M&I
 VOC VOC
 1,4-Dioxane PCB
 OOP B[a]P
 ABN ABN
 Ignit

RECORD OF SITE CONDITION (RSC)

Soil Volume: <350m3 >350m3
 DDWS Not Reportable *See note
 RECORD OF SITE CONDITION (RSC) YES NO

SAMPLE IDENTIFICATION

DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M & I	SVOC	PCB	PHC	VOC	Pest	Other (please specify)	S/PLP tests	TCLP tests
1	Res	Mar 6/24	14:00	5	GW	N							
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

Sampled By (NAME): Shianne Van Duzen Signature: [Signature] Date: 03/06/24 (mm/dd/yy)
 Relinquished by (NAME): Shianne Van Duzen Signature: [Signature] Date: 03/06/24 (mm/dd/yy)
 Note: Submission of samples to SGS is acknowledgment 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.