

July 12, 2023

James Collie
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ISSUED FOR USE
734-2345790100-LTR-V0001-C
Via Email: jcollie@northcogroup.ca

Attention: Mr. Collie

Subject: Groundwater Capacity Assessment of Proposed Highway 130 Senior Housing Development near Thunder Bay, Ontario

This 'Issued for Review' document is provided solely for the purpose of client review and presents our interim findings and recommendations to date. Our usable findings and recommendations are provided only through an 'Issued for Use' document, which will be issued subsequent to this review. Final design should not be undertaken based on the interim recommendations made herein. Once our report is issued for use, the 'Issued for Review' document should be either returned to Tetra Tech Canada Inc. (Tetra Tech) or destroyed.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) is pleased to provide this report describing the scope and findings of our groundwater capacity assessment for the proposed multi-unit senior housing development area near Highway 130, west of Thunder Bay, Ontario.

2.0 SITE SETTING

The subject property consists of approximately 11.3 hectares (ha) of largely undeveloped forest and grass land on the west side of Highway 130, south of Arthur Steet West, with the potential for expansion onto an additional 2.3 ha. The site is surrounded by single home residential development to the east and to the south, while the properties to the north and west show primarily commercial development. A general location plan is provided in Figure 1, attached.

Local site stratigraphy generally consists of a surficial sand unit to depths of 6 m to 12 m below grade, followed by low permeability clay and till to at depth of at least 30 m below grade with intermittent and underlying shale layers. Within the lower portion of the till unit, a sand and gravel seam of 3 m to 10 m thickness is generally encountered. Development of local groundwater resources consists of both shallow wells in the upper sands, and deep wells set in the sand and gravel units within the till.

It is our understanding that the proposed development plans for the property include a series of duplex units, a small apartment block and possibly a small assisted living facility. In total, the number of potential residents could be up to 120 people. At a typical domestic water use rate of 250 L/ person per day, the total groundwater demand could be in the order of 30,000 L/day. In accordance with provincial regulations, an Ontario Ministry of Environment, Conservation and Parks *Permit to Take Water* application is not required for any groundwater development with a capacity of less than 50,000 L/day. For the purpose of evaluating the potential maximum capacity of this

development, an upper design limit of 49,500 L/ day has also been used for groundwater impact modelling purposes. .

This property was the subject of a preliminary hydrogeological assessment in the mid 1990s that was based on testing of three typical residential supply wells installed across the property. These supply wells were drilled to depths of 29.6 m to 42.1 m below grade and completed in deep sand and gravel units found in the till. A prediction of anticipated groundwater drawdown based on the withdrawal of 27,000 L/day indicated that the local aquifer would have the capacity to provide this demand with limited impact on adjacent groundwater users.

Development of the property since that time has been limited to the construction of a church facility in the northeastern corner of the property, which incorporated one of the previous test wells. The remaining two test wells remain in place for use during this assessment. Copies of the original well logs for the three test wells installed in the 1990s are included in Appendix B for general reference.

3.0 PUMPING TEST

To assess the general capacity of the aquifer underlying the site, a four day pumping test was undertaken on each of the two accessible test wells simultaneously in an attempt to stress the aquifer system. Test Well No. 2, located in the west-central portion of the site, was drilled to a depth of 29.6 m below grade and completed with an open hole section from 25.9 m to 29.6 m below grade. In January 2023 the static water level in this well was measured at approximately 4.0 m below grade. The total well depth was measured to be 27.4 m below grade, suggesting limited sedimentation or infilling of the bottom portion of the well. Test Well No. 3, located in the southern portion of the site, was drilled to a depth of 42.1 m below grade and completed with an open hole section from 39.3 m to 42.1 m below grade. In January 2023 the static water level in this well was measured at approximately 5.8 m below grade. The total well depth was measured to be 32.1 m below grade suggesting the possible collapse of the open hole section with additional infilling of the lower portion of the well casing has occurred. The granular nature of the materials however still does allow for the inflow of groundwater in to casing.

These pumping tests were conducted from January 19 to 23, 2023 by NWO Well Services Ltd of Thunder Bay. Submersible pumps were lowered into each well to a depth of around 22 m below grade and both wells were pumped continuously at a rate of 0.5 L/s (8 US gallons per minute) for a total of approximately 86,400 L/ day. Water levels were recorded manually at regular intervals during this period. Well No. 3 was equipped with a pressure transducer to provide a continuous record of the initial groundwater response to the pumping efforts, and of the groundwater recovery following termination of the pumping period.

During the course of the pumping tests, the groundwater levels decreased from approximately 4.0 m to 22.4 m below grade in Test Well No. 2 and from 5.8 m to 23.5 m below grade in Test Well No. 3. Based on the extent of this drawdown, the maximum sustainable yield of any single production well completed in the lower sand and gravel deposits appears to be in the order of 0.5 L/s.

Review of the associated groundwater drawdown measurements showed them to be consistent with anticipated theoretical aquifer responses, so no concerns were noted with the testing process. Analysis of both the pumping test and recovery test data showed the aquifer to have a hydraulic conductivity in the 10^{-5} m/s range, generally representative of a sand deposit mixed with some fine clay and silt. The results of these pumping test analyses are provided in Appendix C.

4.0 GROUNDWATER QUALITY ASSESSMENT

Near the end of each pumping test, a groundwater sample was collected from the pump discharge and submitted for laboratory analysis to assess general water quality. The results of these laboratory analyses are summarized in Tables 1 and 2, attached. The formal laboratory reports are provided in Appendix D.

The results of these analyses were reviewed relative to the Canadian Drinking Water Quality Guidelines for general reference to determine potential water treatment requirements. These analyses showed elevated concentrations of hardness, chloride, iron and sodium above aesthetic guidelines, as well as manganese and barium concentrations above the maximum acceptable concentrations. Concentrations of these parameters are generally lower in Test Well No. 2 in the central portion of the site, in comparison to Test Well No. 3 in the southern area. Based on the similar responses and pumping levels in the two wells, it is assumed there is some subsurface connectivity between the wells, and as a result water quality across the area may naturally blend over time, resulting in variations in water quality.

5.0 AQUIFER PRODUCTION ASSESSMENT

In order to assess the potential yield of the local aquifer relative to the proposed groundwater withdrawal, a computer simulation of the aquifer conditions was developed using the GMS groundwater modeling software. This modeling process involved development of a simulation of baseline groundwater conditions with a relatively even groundwater surface at a depth of 6 m below grade. This water level was selected based on publicly available groundwater well logs and water levels for the wells around the subject site, and the lower of the water levels observed in the test wells prior to the pumping tests. Static conditions were assessed based on assumptions for normal single family home domestic use of 1000 L/day for an estimated 35 homes in the general area, and a commercial use of 5000 L/day for each of five commercial developments in the immediate area.

As a means of assessing the natural fluctuations in the local water level due to continuous use by existing residential and commercial sites, the water level transducer was left in Test Well No. 3 for the period from February 3 to March 8, 2023. For general consistency, the water levels were referenced to an assumed ground surface elevation of 100 m above datum, resulting in static water level elevation values around 94 m above datum. As shown on Figure 2, local use of the aquifer results in regular water level fluctuations in the order of 0.3 m, with the maximum fluctuation over this range of 0.8 m. The use of a 6 m below grade (94 m above datum) static water level is therefore considered to be appropriate for this condition. The resulting simulation of the static water level under current use conditions is shown in Figure 1.

The simulation was then adjusted to reflect the aquifer conditions under the January 2023 pumping test conditions, which showed a water level drawdown in the order of 20 m below static in each of the two on-site wells, under a total pumping rate of 86,400 L/day. This simulation is provided as Figure 3. Under these conditions, the additional drawdown in the water level on adjacent supply wells was expected to have been in the order of between 5 m and 11 m, which depending on placement of the pump in the wells, may adversely impact the production from off-site wells.

The simulation was then adjusted to represent a continuous withdrawal in the order of 30,000 L/day as estimated for the proposed development. This simulation, shown in Figure 4, suggests an increase in groundwater drawdown under the subject site in the order of 1.7 m, to a total depth of approximately 7.5 m below grade (92.5 m above datum), with adjacent well user also experiencing a 1 m to 2 m increase in depth to groundwater relative to the baseline conditions.

Finally, the simulation was adjusted to represent a continuous withdrawal in the order of 49,500 L/ day as the upper design limit for the proposed senior housing development. This simulation, as shown in Figure 5, suggests a decrease in groundwater level under the subject site in the order of 3 m, to a total depth of 9 m below grade (91 m above datum), with adjacent well users also experiencing a 1.5 m to 2.6 m decrease in groundwater levels.

6.0 DISCUSSIONS

Based on the pumping tests conducted in January 2023 and associated groundwater elevation monitoring, the deep sand and gravel aquifer below the proposed Highway 130 senior housing development appears to have the capacity to meet the anticipated upper limit of demand with relatively minimal impact on surrounding existing groundwater users.

7.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of James Collie and their agents. Tetra Tech Canada Inc. (operating as Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than James Collie, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

8.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

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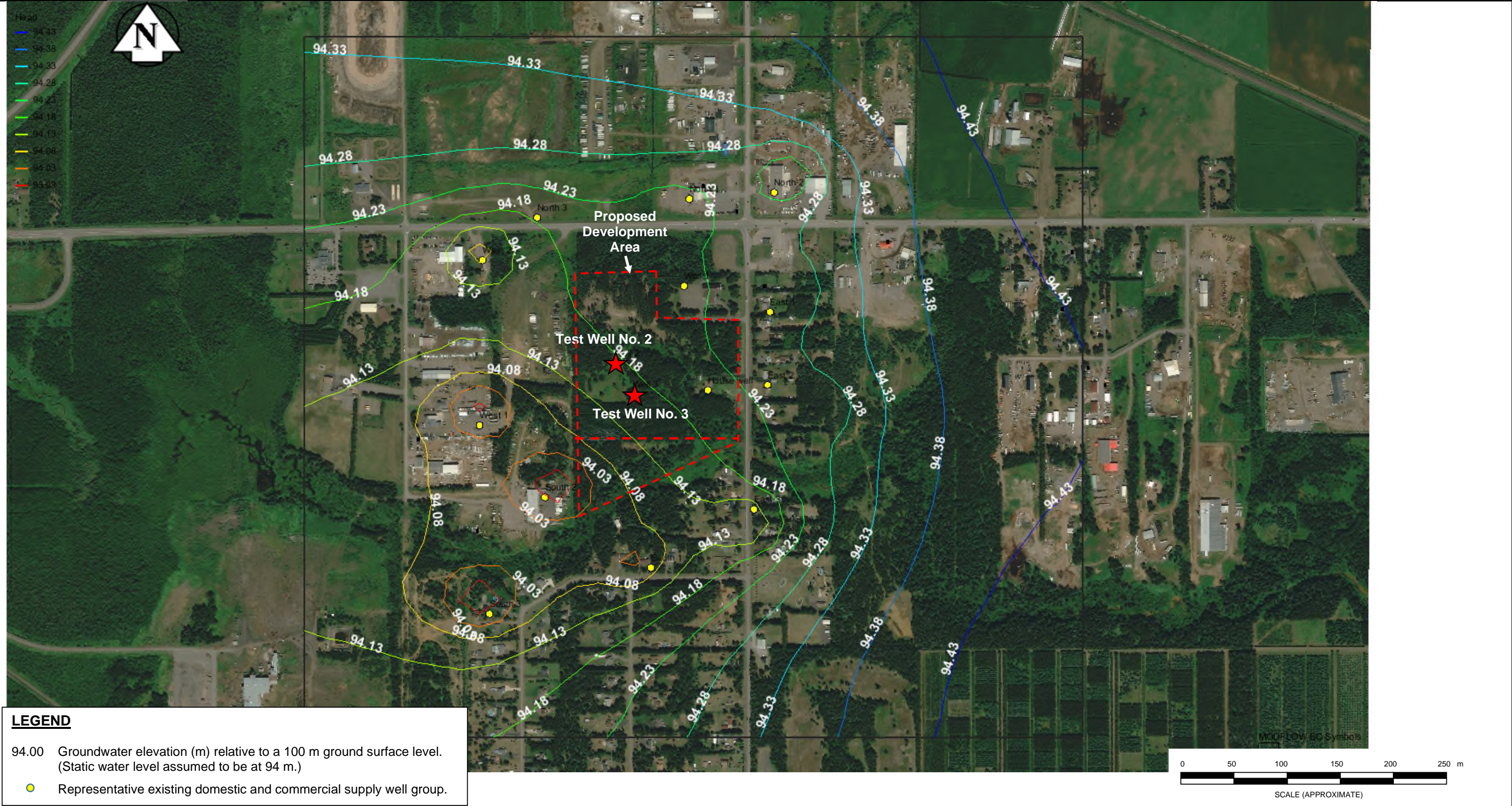
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FIGURES



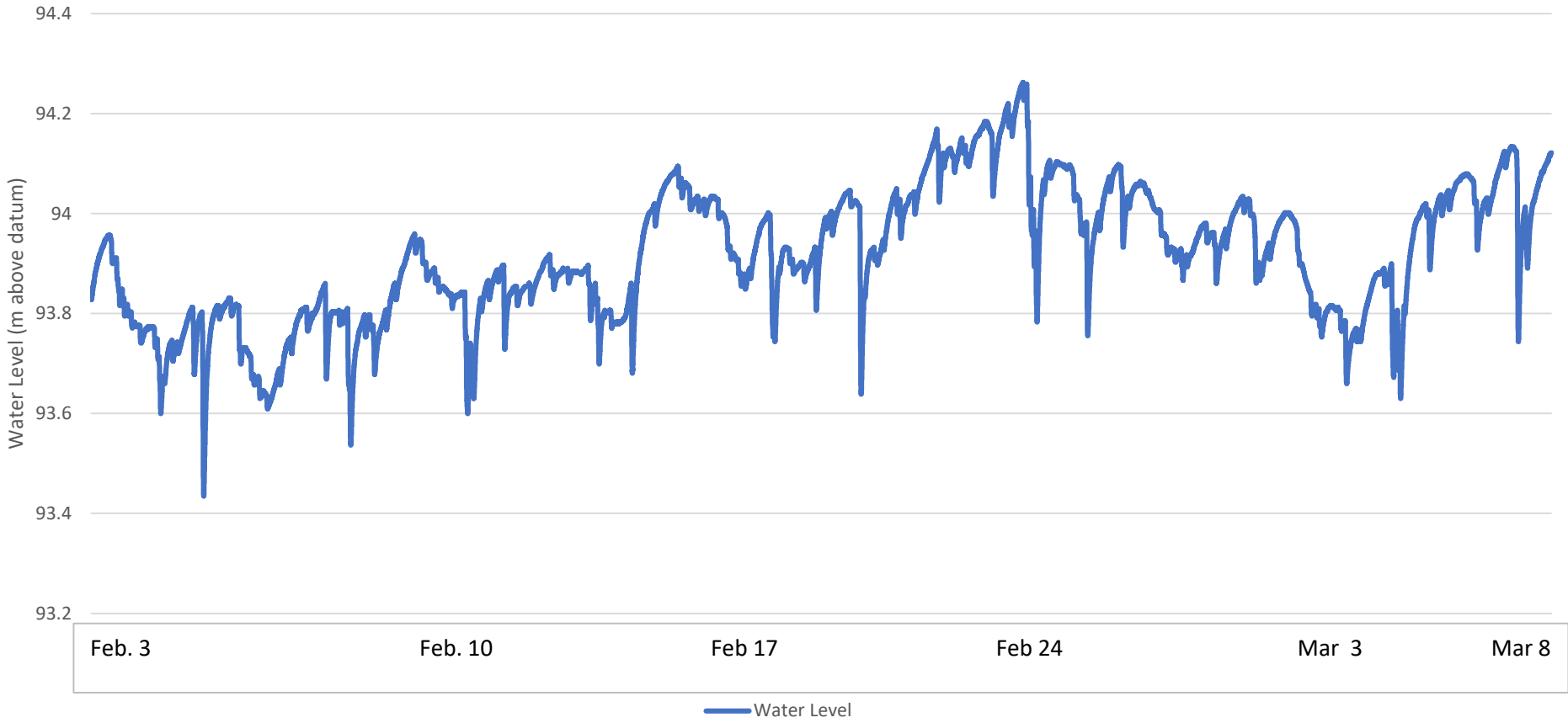
LEGEND

94.00 Groundwater elevation (m) relative to a 100 m ground surface level.
(Static water level assumed to be at 94 m.)

● Representative existing domestic and commercial supply well group.

										CLIENT JAMES COLLIE					
										DRAWING DESCRIPTION FIGURE 1: BASELINE GROUNDWATER CONDITIONS GROUNDWATER CAPACITY ASSESSMENT OF PROPOSED HIGHWAY 130 SENIOR HOUSING DEVELOPMENT					
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		NO.	DATE	DESCRIPTION	PREPARED	REVIEWED	DESIGN	AUTHORIZE		DATE: 28.06.2023					
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Static Groundwater Elevation Relative to 100 m Ground Surface Datum



REFERENCE DRAWINGS:

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CLIENT	JAMES COLLIE
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FIGURE 2: GROUNDWATER ELEVATION FLUCTUATIONS GROUNDWATER CAPACITY ASSESSMENT OF PROPOSED HIGHWAY 130 SENIOR HOUSING DEVELOPMENT			
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94.00 Groundwater elevation (m) relative to a 100 m ground surface level.
(Static water level assumed to be at 94 m.)


● Representative existing domestic and commercial supply well group.

										CLIENT JAMES COLLIE				
										DRAWING DESCRIPTION FIGURE 3: GROUNDWATER CONDITIONS DURING PUMPING TEST GROUNDWATER CAPACITY ASSESSMENT OF PROPOSED HIGHWAY 130 SENIOE HOUSING DEVELOPMENT				
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TABLES

TABLE 1
Groundwater Inorganic and Organic Laboratory Analytical Results
Highway 130 Senior Housing Development Groundwater Assessment
James Collie

Parameter	Analytical Results			Environmental Quality Guidelines ^{a,b}	
	Units	Well 2	Well 3	MAC	AO
Conductivity	(µs/cm)	1020	2590	N.G.	--
Alkalinity, Total (as CaCO3)	mg/L	47	26	N.G.	--
Hardness (as CaCO3) - Dissolved	mg/L	<u>192</u>	614	--	80 - 100
Hardness (as CaCO3) - Total	mg/L	181	631	N.G.	--
Turbidity	NTU	61.8	67.3	N.G.	--
pH	--	7.65	7.42	--	7.0 - 10.5
Chloride (Cl)	mg/L	<u>252</u>	812	--	250
Fluoride (F)	mg/L	0.677	0.448	1.50	--
Nitrate-N	mg/L	<0.200	<0.400	10	--
Nitrite-N	mg/L	<0.100	<0.200	1	--
Sulphate (as SO4)	mg/L	51.4	<6.00	--	500
Total Coliforms	MPN/100 ml	<10	<10	<1	--
Escherichia coli	MPN/100 ml	<10	<10	<1	--
Total Metals					
Aluminum, total	mg/L	<u>0.184</u>	0.0387	2.90	0.1
Antimony, total	mg/L	0.00052	0.00013	0.006	--
Arsenic, total	mg/L	0.00092	0.00034	0.01	--
Barium, total	mg/L	0.0196	2.73	2.00	--
Beryllium, total	mg/L	<0.000020	<0.000020	N.G.	--
Bismuth, total	mg/L	<0.000050	<0.000050	N.G.	--
Boron, total	mg/L	0.162	0.298	5.00	--
Cadmium, total	mg/L	<0.0000550	0.0000051	0.007	--
Calcium, total	mg/L	38.1	179	N.G.	--
Cesium, total	mg/L	0.000036	0.000591	N.G.	--
Chromium, total	mg/L	0.00173	0.00266	0.05	--
Cobalt, total	mg/L	0.00041	0.00039	N.G.	--
Copper, total	mg/L	0.00347	0.015	N.G.	--
Iron, total	mg/L	<u>10.8</u>	48.5	--	0.3
Lead, total	mg/L	0.000686	0.00157	0.01	--
Lithium, total	mg/L	0.0204	0.145	N.G.	--
Magnesium, total	mg/L	20.9	44.7	N.G.	--
Manganese, total	mg/L	0.182	0.459	0.12	0.02
Molybdenum, total	mg/L	0.0545	0.00597	N.G.	--
Nickel, total	mg/L	0.00352	0.0007	N.G.	--
Phosphorus, total	mg/L	<0.050	<0.050	N.G.	--
Potassium, total	mg/L	5.16	9.58	N.G.	--
Rubidium, total	mg/L	0.00248	0.0113	N.G.	--
Selenium, total	mg/L	<0.000050	<0.000050	0.05	--
Silicon, total	mg/L	2.73	3.13	N.G.	--
Silver, total	mg/L	<0.000010	<0.000010	N.G.	--
Sodium, total	mg/L	126	276	--	200
Strontium, total	mg/L	0.565	4.84	7.00	--
Sulfur, total	mg/L	19.6	2.91	N.G.	--
Tellurium, total	mg/L	<0.00020	0.00032	N.G.	--
Thallium, total	mg/L	<0.000010	<0.000010	N.G.	--
Thorium, total	mg/L	<0.00010	<0.00010	N.G.	--
Tin, total	mg/L	0.00061	0.00066	N.G.	--
Titanium, total	mg/L	0.00642	<0.00090	N.G.	--
Tungsten, total	mg/L	<0.00010	0.00016	N.G.	--
Uranium, total	mg/L	0.00011	0.000012	0.02	--
Vanadium, total	mg/L	<0.00050	<0.00050	N.G.	--
Zinc, total	mg/L	0.0041	0.005	--	5.0
Zirconium, total	mg/L	0.00031	<0.00020	N.G.	--

Notes: Concentrations in excess of the Maximum Acceptable Concentration (MAC) are presented in **BOLD** text.

Concentrations in excess of the Aesthetic Objectives are (AO) presented as **underlined** text.

^a Ontario Drinking Water Quality Standards, Ontario Regulation 169/03.

^b Health Canada, September 2022. *Guidelines for Canadian Drinking Water Quality*, Summary Tables.

N.G. = No Guideline limit has been established.

-- = Not applicable.

NTU = Nephelometric Turbidity Units

MPN = Most Probable Number

<p>TABLE 2</p> <p>Groundwater Dissolved Metals Laboratory Analytical Results</p> <p>Highway 130 Senior Housing Development Groundwater Assessment</p> <p>James Collie</p>				
Parameter	Analytical Results (mg/L)		Drinking Water Quality Guidelines ^{a,b} (mg/L)	
	Well 2	Well 3	MAC	AO
Dissolved Aluminum (Al)	<0.0010	<0.0010	2.9	0.1
Dissolved Antimony (Sb)	<0.00010	<0.00010	0.006	--
Dissolved Arsenic (As)	0.00026	<0.00010	0.01	--
Dissolved Barium (Ba)	0.0164	2.10	1.0	--
Dissolved Beryllium (Be)	<0.000020	<0.000020	N.G.	--
Dissolved Bismuth (Bi)	<0.000050	<0.000050	N.G.	--
Dissolved Boron (B)	0.157	0.302	5	--
Dissolved Cadmium (Cd)	<0.0000400	<0.0000050	0.005	--
Dissolved Calcium (Ca)	39.4	171	N.G.	--
Dissolved Cesium (Cs)	0.000015	0.000548	N.G.	--
Dissolved Chromium (Cr)	<0.00050	<0.00050	0.05	--
Dissolved Cobalt (Co)	<0.00010	<0.00010	N.G.	--
Dissolved Copper (Cu)	0.00228	0.00119	2	--
Dissolved Iron (Fe)	0.076	0.040	--	0.3
Dissolved Lead (Pb)	0.000070	<0.000050	0.005	--
Dissolved Lithium (Li)	0.0218	0.142	N.G.	--
Dissolved Magnesium (Mg)	22.7	45.5	N.G.	--
Dissolved Manganese (Mn)	<u>0.0885</u>	<u>0.0409</u>	0.12	0.002
Dissolved Molybdenum (Mo)	0.0578	0.00501	N.G.	--
Dissolved Nickel (Ni)	0.00074	<0.00050	N.G.	--
Dissolved Phosphorus (P)	<0.050	<0.050	N.G.	--
Dissolved Potassium (K)	5.56	10.1	N.G.	--
Dissolved Rubidium (Rb)	0.00244	0.0109	N.G.	--
Dissolved Selenium (Se)	0.00122	0.000128	0.05	--
Dissolved Silicon (Si)	2.37	1.90	N.G.	--
Dissolved Silver (Ag)	<0.000010	<0.000010	N.G.	--
Dissolved Sodium (Na)	130	278	--	200
Dissolved Strontium (Sr)	0.584	4.54	7	--
Dissolved Sulphur (S)	19.4	2.98	N.G.	--
Dissolved Tellurium (Te)	<0.00020	0.00024	N.G.	--
Dissolved Thallium (Tl)	<0.000010	<0.000010	N.G.	--
Dissolved Thorium (Th)	<0.00010	<0.00010	N.G.	--
Dissolved Tin (Sn)	<0.00010	<0.00010	N.G.	--
Dissolved Titanium (Ti)	<0.00030	<0.00030	N.G.	--
Dissolved Tungsten (W)	<0.00010	<0.00010	N.G.	--
Dissolved Uranium (U)	0.000033	<0.000010	0.02	--
Dissolved Vanadium (V)	<0.00050	<0.00050	N.G.	--
Dissolved Zinc (Zn)	0.0019	0.0018	--	5.00
Dissolved Zirconium (Zr)	<0.00030	<0.00030	N.G.	--
<p>Notes: Concentrations in excess of the environmental quality guidelines Maximum Acceptable Concentration (MAC) are presented in BOLD text.</p> <p>Concentrations in excess of the environmental quality guidelines Aesthetic Objectives (AO) are presented as <u>underlined</u> text.</p> <p>^a Ontario Drinking Water Quality Standards, Ontario Regulation 169/03.</p> <p>^b Health Canada, September 2022. Guidelines for Canadian Drinking Water Quality, Summary Tables.</p> <p>N.G. = No Guideline limit has been established. -- = Not Applicable</p>				

PHOTOGRAPHS



Photo 1: General view of Test Well No. 2 in west-central portion of HWY 130 site. (Tetra Tech, January 2023)



Photo 2: General view of pumping test set-up for Test Well No. 2. (Tetra Tech, January 2022)



Photo 3: General view of Test Well No. 3 located in the southern portion of the Highway 130 site. (Tetra Tech, January 2023)



Photo 4: General view of pumping test set-up for Test Well No.3. (Tetra Tech, January 2023)

APPENDIX A

TETRA TECH'S SERVICES AGREEMENT AND LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

1.1 USE OF DOCUMENT AND OWNERSHIP

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1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner

consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX B

BOREHOLE LOGS



Ontario

Ministry
of the
Environment

Test Well No. 1

Subdivision Lot 3
The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

6105277

MUNICIP. 61141

CON.

KAM. N.

02

COUNTY OR DISTRICT

Thunder Bay

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE

PAIPOONGE

CON. BLOCK, TRACT, SURVEY, ETC

Corr 2 North of Kam

LOT

25-27

N 26

DATE COMPLETED

DAY 15 MO 07 YR 94

RC. ELEVATION RC. BASIN CODE II III IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	Topsoil			0	2
Brown	SAND			2	18
Grey	SAND			18	38
Grey	CLAY			38	80
grey	hard pan			80	95
black	gravel	SAND.		95	96
black	SHALE			96	99

31 32

41 WATER RECORD	
WATER FOUND AT - FEET	KIND OF WATER
20	1 <input type="checkbox"/> FRESH 3 <input checked="" type="checkbox"/> SULPHUR 4 <input checked="" type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
95	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
	20-23 1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
	23-28 1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
	30-33 1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS

51 CASING & OPEN HOLE RECORD			
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
			FROM TO
6 1/4	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	198	0 95
6	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC		95 99
	24-25 1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC		27-30

SCREEN	SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
		INCHES	FEET
	MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN	
		FEET	

61 PLUGGING & SEALING RECORD	
DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)
FROM TO	
0 10-13 95	Casing drive shoe
10-21 22-25	bottom
26-29 30-33 60	

71 PUMPING TEST	PUMPING TEST METHOD	10	PUMPING RATE	31-34	DURATION OF PUMPING	15-16 HOURS 17-18 MINS
	1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER		6	GPM		
	STATIC LEVEL	WATER LEVEL END OF PUMPING	25	WATER LEVELS DURING	1 <input checked="" type="checkbox"/> PUMPING 2 <input type="checkbox"/> RECOVERY	
	10-21 80	22-24	15 MINUTES 26-28 30 MINUTES 29-31 45 MINUTES 32-34 60 MINUTES 35-37			
	IF FLOWING, GIVE RATE	30-41	PUMP INTAKE SET AT	WATER AT END OF TEST	42	
		GPM	FEET	1 <input type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY		
	RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	43-45	RECOMMENDED PUMPING RATE	46-49	
	<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	80	FEET	4	GPM	

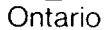
54 FINAL STATUS OF WELL	1 <input checked="" type="checkbox"/> WATER SUPPLY 2 <input type="checkbox"/> OBSERVATION WELL 3 <input type="checkbox"/> TEST HOLE 4 <input type="checkbox"/> RECHARGE WELL	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY 6 <input type="checkbox"/> ABANDONED POOR QUALITY 7 <input type="checkbox"/> UNFINISHED 8 <input type="checkbox"/> DEWATERING	
	55-56 WATER USE	1 <input checked="" type="checkbox"/> DOMESTIC 2 <input type="checkbox"/> STOCK 3 <input type="checkbox"/> IRRIGATION 4 <input type="checkbox"/> INDUSTRIAL <input type="checkbox"/> OTHER	5 <input type="checkbox"/> COMMERCIAL 6 <input type="checkbox"/> MUNICIPAL 7 <input type="checkbox"/> PUBLIC SUPPLY 8 <input type="checkbox"/> COOLING OR AIR CONDITIONING 9 <input type="checkbox"/> NOT USED
	57 METHOD OF CONSTRUCTION	1 <input type="checkbox"/> CABLE TOOL 2 <input type="checkbox"/> ROTARY (CONVENTIONAL) 3 <input type="checkbox"/> ROTARY (REVERSE) 4 <input checked="" type="checkbox"/> ROTARY (AIR) 5 <input type="checkbox"/> AIR PERCUSSION	6 <input type="checkbox"/> BORING 7 <input type="checkbox"/> DIAMOND 8 <input type="checkbox"/> JETTING 9 <input type="checkbox"/> DRIVING <input type="checkbox"/> DIGGING <input type="checkbox"/> OTHER

LOCATION OF WELL	
IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE INDICATE NORTH BY ARROW.	
N	
Hwy H-17	
Hwy 130	
Proposed Lot Layout	
25' 140' 25' 10' well	
Existing Home	
112812	
DRILLERS REMARKS	

CONTRACTOR	NAME OF WELL CONTRACTOR	WELL CONTRACTOR'S LICENCE NUMBER
	FRASER WATER WELLS	5557
	ADDRESS	
	RR# 13 Thunder Bay	
	NAME OF WELL TECHNICIAN	WELL TECHNICIAN'S LICENCE NUMBER
	Rick Fraser	70157
	SIGNATURE OF TECHNICIAN/CONTRACTOR	SUBMISSION DATE
		DAY 26 MO 09 YR 94

OFFICE USE ONLY	DATA SOURCE	58	CONTRACTOR	59-62	DATE RECEIVED	63-68	80
			5557		AUG 29 1994		
	DATE OF INSPECTION	INSPECTOR					
	REMARKS						

CSS.ES



Test Well No. 3

The Ontario Water Resources Act

WATER WELL RECORD

Subdivision Lot 10

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

6105278

MUNICIP. 611A11

CON. KAM N 02

COUNTY OR DISTRICT

TOWNSHIP ~~BOROUGH~~ CITY TOWN VILLAGE

CON	BLOCK	TRACT	SURVEY	ETC
-----	-------	-------	--------	-----

LOT, 25-27

Thunder Bay

PAPOONGE

Case 2 Not Known

№ 6

OWNER / SURNAME FIRST

2# 2 Thunder Bay

P7C4VI

DATE COMPLETED ⁴⁸⁻⁵³
DAY 14 MO 07 YR. 94

RG										RC	ELEVATION	RC	BASIN CODE																
													I				III				IV								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

[illegible][illegible]

41		WATER RECORD			
WATER FOUND AT - FEET		KIND OF WATER			
20-13	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	14		
	2 <input type="checkbox"/> SALTY	4 <input checked="" type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS			
15-18	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	19		
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS			
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	24		
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS			
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	29		
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS			
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	34		
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS			

CASING & OPEN HOLE RECORD				
INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11 6 1/4	<input checked="" type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC	12 109	0	129
17-18 6	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC	19	129	138
24-25	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC	26		27-30

SCREEN	SIZE/ST. OF OPENING (SLOT NO.)	31-33	DIAMETER	34-38	LENGTH	39-40
				INCHES		FEET
	MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN		41-44	10
					FEET	

61		PLUGGING & SEALING RECORD	
DEPTH SET AT - FEET		MATERIAL AND TYPE	(CEMENT GROUT LEAD PACKER, ETC.)
FROM	TO		
0	10-13	129	Casing drives 5400
10-21	22-25	Benavite	
26-29	30-33	80	

71	PUMPING TEST METHOD		10	PUMPING RATE		11-14	DURATION OF PUMPING		
	1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER			50		GPM	1	15-16 HOURS 17-18 MINS	
	STATIC LEVEL		WATER LEVEL END OF PUMPING		25 WATER LEVELS DURING		1 <input checked="" type="checkbox"/> PUMPING 2 <input type="checkbox"/> RECOVERY		
	10-21	22-24	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES			
	4'		20-28	29-31	32-34	35-37			
FEET		FEET		FEET		FEET		FEET	
IF FLOWING, GIVE RATE		38-41	PUMP INTAKE SET AT		WATER AT END OF TEST		42		
GPM		GPM		FEET		1 <input checked="" type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY			
RECOMMENDED PUMP TYPE		RECOMMENDED PUMP SETTING		43-45	RECOMMENDED PUMPING RATE		46-49		
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP		70'		FEET		5		GPM	

<p>FINAL STATUS OF WELL</p>	<p>54</p> <p>1 <input checked="" type="checkbox"/> WATER SUPPLY 2 <input type="checkbox"/> OBSERVATION WELL 3 <input type="checkbox"/> TEST HOLE 4 <input type="checkbox"/> RECHARGE WELL</p>	<p>5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY 6 <input type="checkbox"/> ABANDONED POOR QUALITY 7 <input type="checkbox"/> UNFINISHED 8 <input type="checkbox"/> DEWATERING</p>
<p>WATER USE</p>	<p>55-56</p> <p>1 <input checked="" type="checkbox"/> DOMESTIC 2 <input type="checkbox"/> STOCK 3 <input type="checkbox"/> IRRIGATION 4 <input type="checkbox"/> INDUSTRIAL <input type="checkbox"/> OTHER</p>	<p>5 <input type="checkbox"/> COMMERCIAL 6 <input type="checkbox"/> MUNICIPAL 7 <input type="checkbox"/> PUBLIC SUPPLY 8 <input type="checkbox"/> COOLING OR AIR CONDITIONING 9 <input type="checkbox"/> NOT USED</p>
<p>METHOD OF CONSTRUCTION</p>	<p>57</p> <p>1 <input type="checkbox"/> CABLE TOOL 2 <input type="checkbox"/> ROTARY (CONVENTIONAL) 3 <input checked="" type="checkbox"/> ROTARY (REVERSE) 4 <input checked="" type="checkbox"/> ROTARY (AIR) 5 <input type="checkbox"/> AIR PERCUSSION</p>	<p>6 <input type="checkbox"/> BORING 7 <input type="checkbox"/> DIAMOND 8 <input type="checkbox"/> JETTING 9 <input type="checkbox"/> DRIVING <input type="checkbox"/> DIGGING <input type="checkbox"/> OTHER</p>

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE INDICATE NORTH BY ARROW.

Proposed Lot Layout

Proposed Rd

Existing

Home

20' 10" 0 WELL

1000'

130'

112811

DRILLERS REMARKS

CONTRACTOR	NAME OF WELL CONTRACTOR		WELL CONTRACTOR'S LICENCE NUMBER	
	FRASER WATERWORKS		5557	
	ADDRESS			
	RR#13 Thunder Bay			
	NAME OF WELL TECHNICIAN		WELL TECHNICIAN'S LICENCE NUMBER	
	Rick Fraser		T0259	
	SIGNATURE OF TECHNICIAN / CONTRACTOR		SUBMISSION DATE	
	[Signature]		DATE 26 MO. 08 YR. 94	

OFFICE USE ONLY	DATA SOURCE	58	CONTRACTOR	59-52	DATE RECEIVED	63-68	80
	5557		AUG 29 1994				
	DATE OF INSPECTION		INSPECTOR				
	REMARKS						
	CSS.ES						

APPENDIX C

PUMPING TEST ANALYSIS



TETRA TECH

Pumping Test Analysis Report

Project: Hwy 130 Development Water Supply

Number: 734-2345790100

Client: James Collie

Location: Highway 130, Thunder Bay

Pumping Test: Test Well No.3 Pumping Test

Pumping Well: Well No. 3

Test Conducted by: NWO Well Services Ltd.

Test Date: 2023-01-19

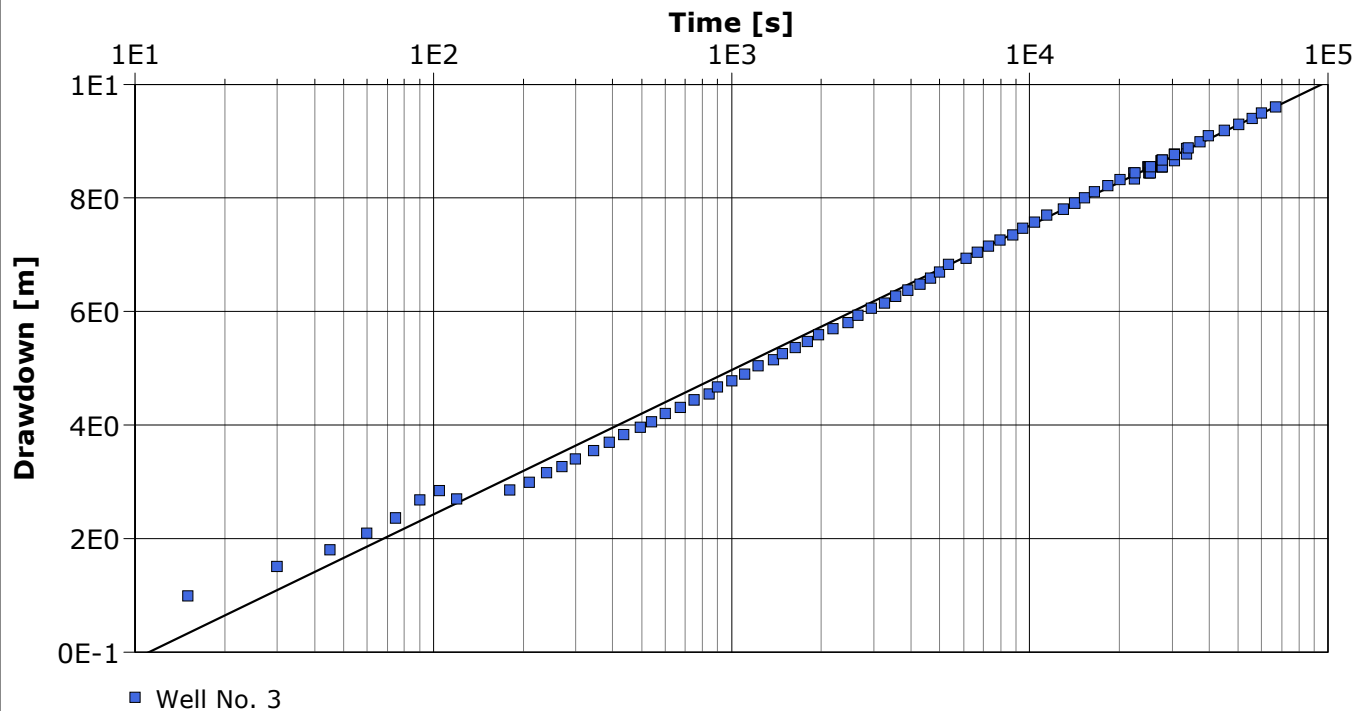
Analysis Performed by:

Well No. 3 - Pumping

Analysis Date: 2023-03-28

Aquifer Thickness: 6.00 m

Discharge Rate: 0.5 [l/s]



Calculation using COOPER & JACOB

Observation Well	Transmissivity [m ² /s]	Hydraulic Conductivity [m/s]	Storage coefficient	Radial Distance to PW [m]	
Well No. 3	3.60×10^{-5}	6.00×10^{-6}	3.53×10^{-2}	0.16	



Pumping Test Analysis Report

Project: Hwy 130 Development Water Supply

Number: 734-2345790100

Client: James Collie

Location: Highway 130, Thunder Bay

Pumping Test: Test Well No3 Recovery Test

Pumping Well: Well No. 3

Test Conducted by:

Test Date: 2023-03-28

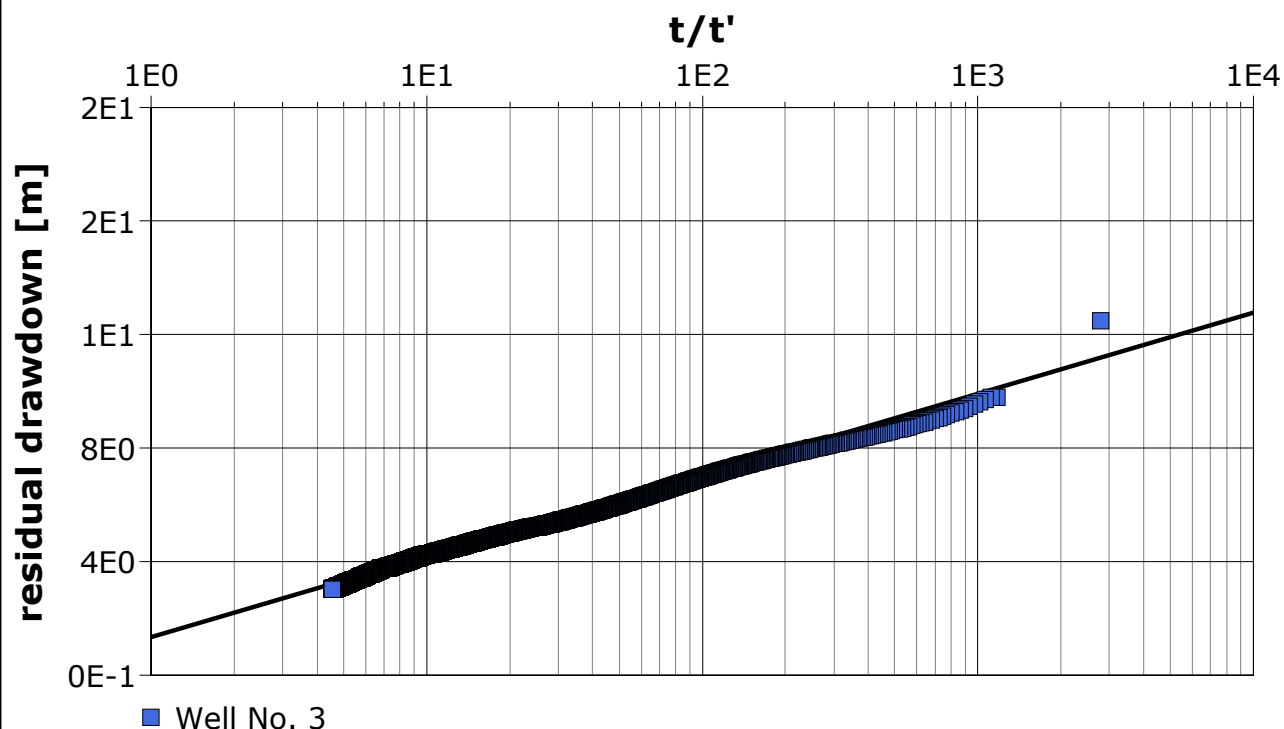
Analysis Performed by:

Well No. 3 recovery

Analysis Date: 2023-03-28

Aquifer Thickness: 6.00 m

Discharge: variable, average rate 0.5 [l/s]



Calculation using THEIS & JACOB

Observation Well	Transmissivity [m ² /s]	Hydraulic Conductivity [m/s]	Radial Distance to PW [m]	
Well No. 3	3.20×10^{-5}	5.33×10^{-6}	0.16	



Pumping Test Analysis Report

Project: Hwy 130 Development Water Supply

Number: 734-2345790100

Client: James Collie

Location: Highway 130, Thunder Bay

Pumping Test: Well No. 2 Pumping Test

Pumping Well: Well No. 2

Test Conducted by: NWO Well Service Ltd.

Test Date: 2023-01-18

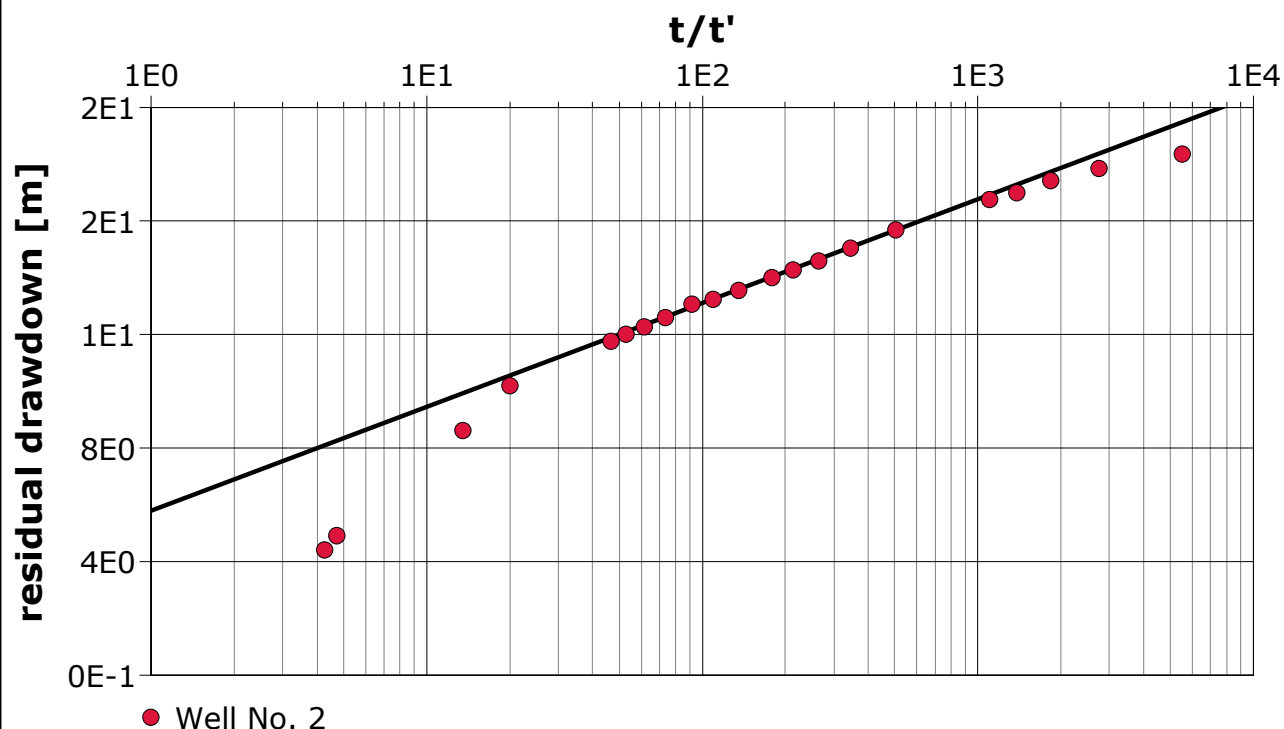
Analysis Performed by:

Well No. 2 Recovery

Analysis Date: 2023-03-28

Aquifer Thickness: 6.00 m

Discharge: variable, average rate 0.5 [l/s]



Calculation using THEIS & JACOB

Observation Well	Transmissivity [m ² /s]	Hydraulic Conductivity [m/s]	Radial Distance to PW [m]	
Well No. 2	2.50×10^{-5}	4.17×10^{-6}	0.16	



Pumping Test Analysis Report

Project: Hwy 130 Development Water Supply

Number: 734-2345790100

Client: James Collie

Location: Highway 130, Thunder Bay

Pumping Test: Well No. 2 Pumping Test

Pumping Well: Well No. 2

Test Conducted by: NWO Well Service Ltd.

Test Date: 2023-01-18

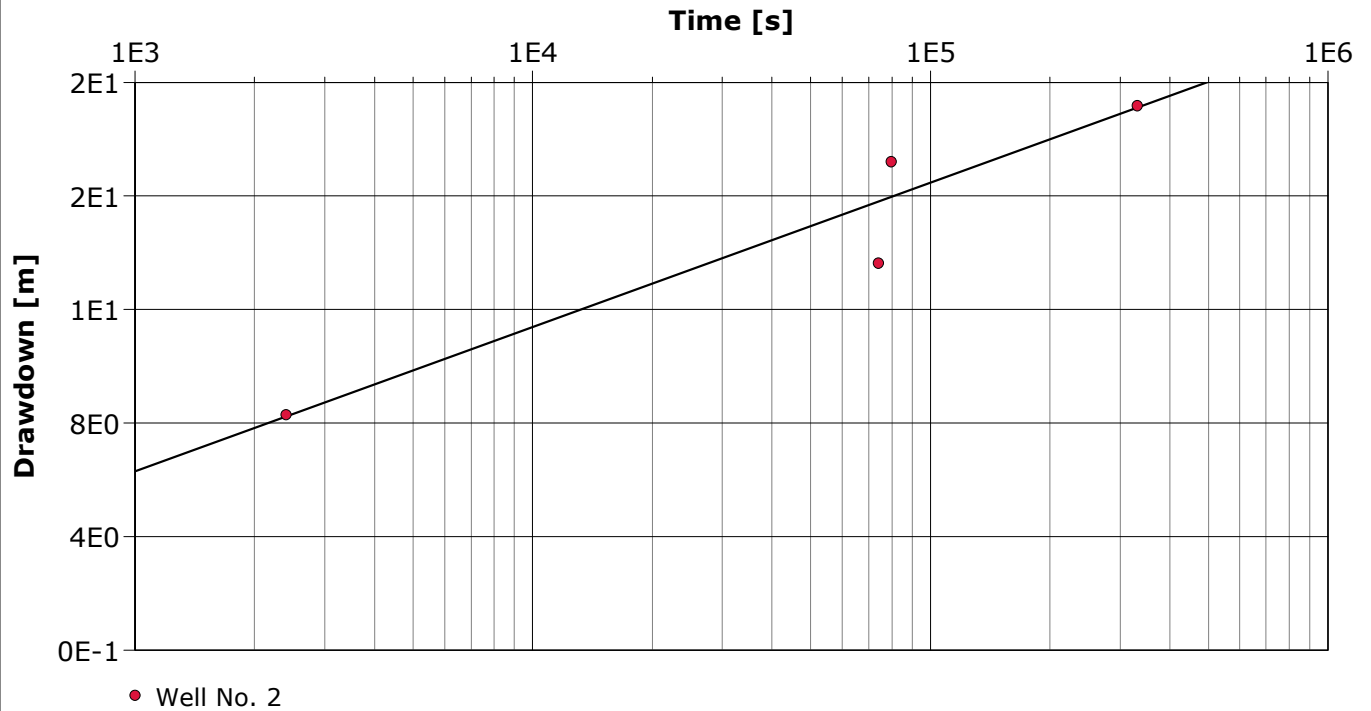
Analysis Performed by:

Well No. 2 Pump

Analysis Date: 2023-05-31

Aquifer Thickness: 6.00 m

Discharge: variable, average rate 0.5 [l/s]



Calculation using COOPER & JACOB

Observation Well	Transmissivity [m ² /s]	Hydraulic Conductivity [m/s]	Storage coefficient	Radial Distance to PW [m]	
Well No. 2	1.80×10^{-5}	3.00×10^{-6}	9.19×10^{-2}	0.16	

APPENDIX D

LABORATORY ANALYTICAL REPORTS

CERTIFICATE OF ANALYSIS

Work Order	: TY2300684	Page	: 1 of 6
Client	: Tetra Tech Canada Inc.	Laboratory	: Thunder Bay - Environmental
Contact	: Ryan Wizbicki	Account Manager	: Cassidy Young
Address	: 400-161 Portage Ave East Winnipeg MB Canada R3B 0Y4	Address	: 1081 Barton Street Thunder Bay ON Canada P7B 5N3
Telephone	: 204 954 6930	Telephone	: +1 807 623 6463
Project	: 734-2345790100	Date Samples Received	: 25-Jan-2023 09:03
PO	: Tetra Tech Standard	Date Analysis Commenced	: 25-Jan-2023
C-O-C number	: ----	Issue Date	: 30-Jan-2023 15:14
Sampler	: ----		
Site	: ----		
Quote number	: Standard Pricing		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Cassandra Grzelewski	Team Leader - Inorganics	Inorganics, Thunder Bay, Ontario
Julie Ruoho	Teamleader Wet Chem	Inorganics, Thunder Bay, Ontario
Julie Ruoho	Teamleader Wet Chem	Microbiology, Thunder Bay, Ontario
Shannon Veltri	Supervisor - Water Chemistry	Metals, Thunder Bay, Ontario



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	Description
-	no units
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
MPN/100mL	most probable number per hundred millilitres
NTU	nephelometric turbidity units
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DTSE	Dissolved Se concentration exceeds total. Positive bias on D-Se suspected due to signal enhancement from volatile selenium species. Contact ALS if an alternative test to address this interference is needed.



Analytical Results

Sub-Matrix: Water					Client sample ID	Well 2 GW	Well 3 GW	----	----	----
(Matrix: Water)										
					Client sampling date / time	24-Jan-2023 14:00	24-Jan-2023 12:20	----	----	----
Analyte		CAS Number	Method	LOR	Unit	TY2300684-001	TY2300684-002	-----	-----	-----
						Result	Result	----	----	----
Physical Tests										
Conductivity		----	E100	2.0	µS/cm	1020	2590	----	----	----
Hardness (as CaCO3), dissolved		----	EC100	0.60	mg/L	192	614	----	----	----
Hardness (as CaCO3), from total Ca/Mg		----	EC100A	0.60	mg/L	181	631	----	----	----
pH		----	E108	0.10	pH units	7.65	7.42	----	----	----
Turbidity		----	E121	0.10	NTU	61.8	67.3	----	----	----
Alkalinity, total (as CaCO3)		----	E290	2.0	mg/L	47.0	26.0	----	----	----
Anions and Nutrients										
Chloride		16887-00-6	E235.Cl	0.50	mg/L	252	812	----	----	----
Fluoride		16984-48-8	E235.F	0.020	mg/L	0.677	0.448	----	----	----
Nitrate (as N)		14797-55-8	E235.NO3	0.020	mg/L	<0.200 ^{DLDS}	<0.400 ^{DLDS}	----	----	----
Nitrite (as N)		14797-65-0	E235.NO2	0.010	mg/L	<0.100 ^{DLDS}	<0.200 ^{DLDS}	----	----	----
Sulfate (as SO4)		14808-79-8	E235.SO4	0.30	mg/L	51.4	<6.00 ^{DLDS}	----	----	----
Microbiological Tests										
Coliforms, total		----	E010	1	MPN/100mL	Not Detected ^{DLM}	Not Detected ^{DLM}	----	----	----
Coliforms, Escherichia coli [E. coli]		----	E010	1	MPN/100mL	Not Detected ^{DLM}	Not Detected ^{DLM}	----	----	----
Total Metals										
Aluminum, total		7429-90-5	E420	0.0030	mg/L	0.184	0.0387	----	----	----
Antimony, total		7440-36-0	E420	0.00010	mg/L	0.00052	0.00013	----	----	----
Arsenic, total		7440-38-2	E420	0.00010	mg/L	0.00092	0.00034	----	----	----
Barium, total		7440-39-3	E420	0.00010	mg/L	0.0196	2.73	----	----	----
Beryllium, total		7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	----	----	----
Bismuth, total		7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Boron, total		7440-42-8	E420	0.010	mg/L	0.162	0.298	----	----	----
Cadmium, total		7440-43-9	E420	0.0000050	mg/L	<0.0000550	0.0000051	----	----	----
Calcium, total		7440-70-2	E420	0.050	mg/L	38.1	179	----	----	----
Cesium, total		7440-46-2	E420	0.000010	mg/L	0.000036	0.000591	----	----	----
Chromium, total		7440-47-3	E420	0.00050	mg/L	0.00173	0.00266	----	----	----
Cobalt, total		7440-48-4	E420	0.00010	mg/L	0.00041	0.00039	----	----	----
Copper, total		7440-50-8	E420	0.00050	mg/L	0.00347	0.0150	----	----	----



Analytical Results

Sub-Matrix: Water					Client sample ID	Well 2 GW	Well 3 GW	----	----	----
(Matrix: Water)										
Client sampling date / time					24-Jan-2023 14:00	24-Jan-2023 12:20	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	TY2300684-001	TY2300684-002	-----	-----	-----	
					Result	Result	----	----	----	
Total Metals										
Iron, total	7439-89-6	E420	0.010	mg/L	10.8	48.5	----	----	----	
Lead, total	7439-92-1	E420	0.000050	mg/L	0.000686	0.00157	----	----	----	
Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0204	0.145	----	----	----	
Magnesium, total	7439-95-4	E420	0.0050	mg/L	20.9	44.7	----	----	----	
Manganese, total	7439-96-5	E420	0.00010	mg/L	0.182	0.459	----	----	----	
Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0545	0.00597	----	----	----	
Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00352	0.00070	----	----	----	
Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	----	----	----	
Potassium, total	7440-09-7	E420	0.050	mg/L	5.16	9.58	----	----	----	
Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00248	0.0113	----	----	----	
Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Silicon, total	7440-21-3	E420	0.10	mg/L	2.73	3.13	----	----	----	
Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Sodium, total	7440-23-5	E420	0.050	mg/L	126	276	----	----	----	
Strontium, total	7440-24-6	E420	0.00020	mg/L	0.565	4.84	----	----	----	
Sulfur, total	7704-34-9	E420	0.50	mg/L	19.6	2.91	----	----	----	
Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	0.00032	----	----	----	
Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Tin, total	7440-31-5	E420	0.00010	mg/L	0.00061	0.00066	----	----	----	
Titanium, total	7440-32-6	E420	0.00030	mg/L	0.00642	<0.00090	----	----	----	
Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	0.00016	----	----	----	
Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000110	0.000012	----	----	----	
Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Zinc, total	7440-66-6	E420	0.0030	mg/L	0.0041	0.0050	----	----	----	
Zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00031	<0.00020	----	----	----	
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	<0.0010	----	----	----	
Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00026	<0.00010	----	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	Well 2 GW	Well 3 GW	----	----	----
(Matrix: Water)										
Client sampling date / time					24-Jan-2023 14:00	24-Jan-2023 12:20	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	TY2300684-001	TY2300684-002	-----	-----	-----	
					Result	Result	----	----	----	
Dissolved Metals										
Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0164	2.10	----	----	----	
Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	----	----	----	
Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.157	0.302	----	----	----	
Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000400 ^{DLM}	<0.0000050	----	----	----	
Calcium, dissolved	7440-70-2	E421	0.050	mg/L	39.4	171	----	----	----	
Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000015	0.000548	----	----	----	
Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00228	0.00119	----	----	----	
Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.076	0.040	----	----	----	
Lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000070	<0.000050	----	----	----	
Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0218	0.142	----	----	----	
Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	22.7	45.5	----	----	----	
Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0885	0.0409	----	----	----	
Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0578	0.00501	----	----	----	
Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00074	<0.00050	----	----	----	
Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	----	----	----	
Potassium, dissolved	7440-09-7	E421	0.050	mg/L	5.56	10.1	----	----	----	
Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00244	0.0109	----	----	----	
Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00122 ^{DTSE}	0.000128 ^{DTSE}	----	----	----	
Silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.37	1.90	----	----	----	
Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Sodium, dissolved	7440-23-5	E421	0.050	mg/L	130	278	----	----	----	
Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.584	4.54	----	----	----	
Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	19.4	2.98	----	----	----	
Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	0.00024	----	----	----	
Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	Well 2 GW	Well 3 GW	----	----	----
(Matrix: Water)										
					Client sampling date / time	24-Jan-2023 14:00	24-Jan-2023 12:20	----	----	----
Analyte	CAS Number	Method	LOR	Unit	TY2300684-001	TY2300684-002	-----	-----	-----	
					Result	Result	----	----	----	
Dissolved Metals										
Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	----	----	----	
Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000033	<0.000010	----	----	----	
Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0019	0.0018	----	----	----	
Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	----	----	----	
Dissolved metals filtration location	----	EP421	-	-	Field	Field	----	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: TY2300684	Page	: 1 of 9
Client	: Tetra Tech Canada Inc.	Laboratory	: Thunder Bay - Environmental
Contact	: Ryan Wizbicki	Account Manager	: Cassidy Young
Address	: 400-161 Portage Ave East Winnipeg MB Canada R3B 0Y4	Address	: 1081 Barton Street Thunder Bay, Ontario Canada P7B 5N3
Telephone	: 204 954 6930	Telephone	: +1 807 623 6463
Project	: 734-2345790100	Date Samples Received	: 25-Jan-2023 09:03
PO	: Tetra Tech Standard	Issue Date	: 30-Jan-2023 15:14
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Standard Pricing		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] Well 2 - GW	E235.Cl	24-Jan-2023	26-Jan-2023	----	----		26-Jan-2023	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] Well 3 - GW	E235.Cl	24-Jan-2023	26-Jan-2023	----	----		26-Jan-2023	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] Well 2 - GW	E235.F	24-Jan-2023	26-Jan-2023	----	----		26-Jan-2023	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] Well 3 - GW	E235.F	24-Jan-2023	26-Jan-2023	----	----		26-Jan-2023	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] Well 2 - GW	E235.NO3	24-Jan-2023	26-Jan-2023	----	----		26-Jan-2023	7 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] Well 3 - GW	E235.NO3	24-Jan-2023	26-Jan-2023	----	----		26-Jan-2023	7 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP] Well 2 - GW	E235.NO2	24-Jan-2023	26-Jan-2023	----	----		26-Jan-2023	7 days	2 days	✓



Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP] Well 3 - GW	E235.NO2	24-Jan-2023	26-Jan-2023	----	----		26-Jan-2023	7 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP] Well 2 - GW	E235.SO4	24-Jan-2023	26-Jan-2023	----	----		26-Jan-2023	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP] Well 3 - GW	E235.SO4	24-Jan-2023	26-Jan-2023	----	----		26-Jan-2023	28 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) Well 2 - GW	E421	24-Jan-2023	27-Jan-2023	----	----		27-Jan-2023	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) Well 3 - GW	E421	24-Jan-2023	27-Jan-2023	----	----		27-Jan-2023	180 days	3 days	✓
Microbiological Tests : Total Coliforms and E. coli (Enzyme Substrate)										
Sterile HDPE (Sodium thiosulphate) [ON MECP] Well 2 - GW	E010	24-Jan-2023	----	----	----		25-Jan-2023	48 hrs	26 hrs	✓
Microbiological Tests : Total Coliforms and E. coli (Enzyme Substrate)										
Sterile HDPE (Sodium thiosulphate) [ON MECP] Well 3 - GW	E010	24-Jan-2023	----	----	----		25-Jan-2023	48 hrs	28 hrs	✓
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] Well 2 - GW	E290	24-Jan-2023	26-Jan-2023	----	----		27-Jan-2023	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] Well 3 - GW	E290	24-Jan-2023	26-Jan-2023	----	----		27-Jan-2023	14 days	3 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Conductivity in Water										
HDPE [ON MECP] Well 2 - GW	E100	24-Jan-2023	26-Jan-2023	----	----		27-Jan-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] Well 3 - GW	E100	24-Jan-2023	26-Jan-2023	----	----		27-Jan-2023	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] Well 2 - GW	E108	24-Jan-2023	26-Jan-2023	----	----		27-Jan-2023	14 days	3 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] Well 3 - GW	E108	24-Jan-2023	26-Jan-2023	----	----		27-Jan-2023	14 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP] Well 2 - GW	E121	24-Jan-2023	----	----	----		25-Jan-2023	3 days	1 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP] Well 3 - GW	E121	24-Jan-2023	----	----	----		25-Jan-2023	3 days	1 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Well 2 - GW	E420	24-Jan-2023	26-Jan-2023	----	----		27-Jan-2023	180 days	3 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Well 3 - GW	E420	24-Jan-2023	26-Jan-2023	----	----		27-Jan-2023	180 days	3 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	814616	1	10	10.0	5.0	✔
Chloride in Water by IC	E235.Cl	814622	1	2	50.0	5.0	✔
Conductivity in Water	E100	814618	0	8	0.0	5.0	✖
Dissolved Metals in Water by CRC ICPMS	E421	815935	1	12	8.3	5.0	✔
Fluoride in Water by IC	E235.F	814623	1	3	33.3	5.0	✔
Nitrate in Water by IC	E235.NO3	814619	1	7	14.2	5.0	✔
Nitrite in Water by IC	E235.NO2	814620	1	7	14.2	5.0	✔
pH by Meter	E108	814617	0	11	0.0	5.0	✖
Sulfate in Water by IC	E235.SO4	814621	1	9	11.1	5.0	✔
Total Coliforms and E. coli (Enzyme Substrate)	E010	813867	1	6	16.6	5.0	✔
Total metals in Water by CRC ICPMS	E420	814607	1	19	5.2	5.0	✔
Turbidity by Nephelometry	E121	813909	1	2	50.0	5.0	✔
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	814616	1	10	10.0	5.0	✔
Chloride in Water by IC	E235.Cl	814622	1	2	50.0	5.0	✔
Conductivity in Water	E100	814618	1	8	12.5	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	815935	1	12	8.3	5.0	✔
Fluoride in Water by IC	E235.F	814623	1	3	33.3	5.0	✔
Nitrate in Water by IC	E235.NO3	814619	1	7	14.2	5.0	✔
Nitrite in Water by IC	E235.NO2	814620	1	7	14.2	5.0	✔
pH by Meter	E108	814617	1	11	9.0	5.0	✔
Sulfate in Water by IC	E235.SO4	814621	1	9	11.1	5.0	✔
Total metals in Water by CRC ICPMS	E420	814607	1	19	5.2	5.0	✔
Turbidity by Nephelometry	E121	813909	1	2	50.0	5.0	✔
Method Blanks (MB)							
Alkalinity Species by Titration	E290	814616	1	10	10.0	5.0	✔
Chloride in Water by IC	E235.Cl	814622	1	2	50.0	5.0	✔
Conductivity in Water	E100	814618	1	8	12.5	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	815935	1	12	8.3	5.0	✔
Fluoride in Water by IC	E235.F	814623	1	3	33.3	5.0	✔
Nitrate in Water by IC	E235.NO3	814619	1	7	14.2	5.0	✔
Nitrite in Water by IC	E235.NO2	814620	1	7	14.2	5.0	✔
Sulfate in Water by IC	E235.SO4	814621	1	9	11.1	5.0	✔
Total Coliforms and E. coli (Enzyme Substrate)	E010	813867	1	6	16.6	5.0	✔
Total metals in Water by CRC ICPMS	E420	814607	1	19	5.2	5.0	✔

Page : 7 of 9
 Work Order : TY2300684
 Client : Tetra Tech Canada Inc.
 Project : 734-2345790100



Matrix: **Water**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
<i>Analytical Methods</i>	<i>Method</i>	<i>QC Lot #</i>	<i>QC</i>	<i>Regular</i>	<i>Actual</i>	<i>Expected</i>	<i>Evaluation</i>
Method Blanks (MB) - Continued							
Turbidity by Nephelometry	E121	813909	1	2	50.0	5.0	✔
Matrix Spikes (MS)							
Chloride in Water by IC	E235.Cl	814622	1	2	50.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	815935	1	12	8.3	5.0	✔
Fluoride in Water by IC	E235.F	814623	1	3	33.3	5.0	✔
Nitrate in Water by IC	E235.NO3	814619	1	7	14.2	5.0	✔
Nitrite in Water by IC	E235.NO2	814620	1	7	14.2	5.0	✔
Sulfate in Water by IC	E235.SO4	814621	1	9	11.1	5.0	✔
Total metals in Water by CRC ICPMS	E420	814607	1	19	5.2	5.0	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Coliforms and E. coli (Enzyme Substrate)	E010 Thunder Bay - Environmental	Water	APHA 9223 (mod)	The enzyme substrate test simultaneously detects Total Coliforms and E. coli in a 100 mL sample after incubation at $35.0 \pm 0.5^{\circ}\text{C}$ for either 18 or 24 hours (dependent on reagent used).
Conductivity in Water	E100 Thunder Bay - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C .
pH by Meter	E108 Thunder Bay - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally $20 \pm 5^{\circ}\text{C}$). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Thunder Bay - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
Chloride in Water by IC	E235.Cl Thunder Bay - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Thunder Bay - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Thunder Bay - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Thunder Bay - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Thunder Bay - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Thunder Bay - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.



<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Total metals in Water by CRC ICPMS	E420 Thunder Bay - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Thunder Bay - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Thunder Bay - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A Thunder Bay - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Metals Water Filtration	EP421 Thunder Bay - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .

QUALITY CONTROL REPORT

Work Order	: TY2300684	Page	: 1 of 15
Client	: Tetra Tech Canada Inc.	Laboratory	: Thunder Bay - Environmental
Contact	: Ryan Wizbicki	Account Manager	: Cassidy Young
Address	: 400-161 Portage Ave East Winnipeg MB Canada R3B 0Y4	Address	: 1081 Barton Street Thunder Bay, Ontario Canada P7B 5N3
Telephone	:	Telephone	: +1 807 623 6463
Project	: 734-2345790100	Date Samples Received	: 25-Jan-2023 09:03
PO	: Tetra Tech Standard	Date Analysis Commenced	: 25-Jan-2023
C-O-C number	: ----	Issue Date	: 30-Jan-2023 15:14
Sampler	: ---- 204 954 6930		
Site	: ----		
Quote number	: Standard Pricing		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Cassandra Grzelewski	Team Leader - Inorganics	Thunder Bay Inorganics, Thunder Bay, Ontario
Julie Ruoho	Teamleader Wet Chem	Thunder Bay Inorganics, Thunder Bay, Ontario
Julie Ruoho	Teamleader Wet Chem	Thunder Bay Microbiology, Thunder Bay, Ontario
Shannon Veltri	Supervisor - Water Chemistry	Thunder Bay Metals, Thunder Bay, Ontario

Page : 2 of 15
Work Order : TY2300684
Client : Tetra Tech Canada Inc.
Project : 734-2345790100



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 813909)											
TY2300684-001	Well 2 GW	Turbidity	----	E121	0.10	NTU	61.8	62.1	0.484%	15%	----
Physical Tests (QC Lot: 814616)											
TY2300680-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	128	139	8.03%	20%	----
Anions and Nutrients (QC Lot: 814619)											
TY2300684-001	Well 2 GW	Nitrate (as N)	14797-55-8	E235.NO3	0.200	mg/L	<0.200	<0.200	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 814620)											
TY2300684-001	Well 2 GW	Nitrite (as N)	14797-65-0	E235.NO2	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 814621)											
TY2300684-001	Well 2 GW	Sulfate (as SO4)	14808-79-8	E235.SO4	3.00	mg/L	51.4	51.0	0.908%	20%	----
Anions and Nutrients (QC Lot: 814622)											
TY2300684-001	Well 2 GW	Chloride	16887-00-6	E235.Cl	5.00	mg/L	252	252	0.303%	20%	----
Anions and Nutrients (QC Lot: 814623)											
TY2300684-001	Well 2 GW	Fluoride	16984-48-8	E235.F	0.200	mg/L	0.677	0.689	0.012	Diff <2x LOR	----
Microbiological Tests (QC Lot: 813867)											
TY2300684-001	Well 2 GW	Coliforms, Escherichia coli [E. coli]	----	E010	10	MPN/100mL	<10	<10	0	Diff <2x LOR	----
		Coliforms, total	----	E010	10	MPN/100mL	<10	<10	0	Diff <2x LOR	----
Total Metals (QC Lot: 814607)											
TY2300485-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.539	0.545	1.17%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	0.00020	0.00019	0.00002	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00051	0.00051	0.000003	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.0407	0.0415	1.81%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	0.000175	0.000162	0.000013	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	0.131	0.132	0.792%	20%	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000124	0.0000155	0.0000031	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	37.0	36.9	0.320%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000051	0.000051	0.00000001	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	0.00146	<0.00050	0.00096	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00024	0.00023	0.000006	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.0164	0.0164	0.249%	20%	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 814607) - continued											
TY2300485-001	Anonymous	Iron, total	7439-89-6	E420	0.010	mg/L	0.545	0.548	0.616%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000200	0.000189	0.000011	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0055	0.0054	0.00009	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	12.5	12.4	0.653%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.198	0.198	0.208%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00101	0.000988	2.61%	20%	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00176	0.00170	0.00006	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	0.358	0.370	0.012	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	20.3	20.6	1.58%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.0257	0.0253	1.36%	20%	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000145	0.000109	0.000036	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	4.91	4.85	1.24%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	74.5	75.1	0.802%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.0929	0.0928	0.158%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	17.7	17.8	0.193%	20%	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	0.00017	0.00017	0.000004	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	0.00176	0.00149	0.00027	Diff <2x LOR	----
		Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000104	0.000100	4.11%	20%	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	0.0220	0.0220	0.00007	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00026	0.00025	0.00002	Diff <2x LOR	----
Dissolved Metals (QC Lot: 815935)											
TY2300662-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0094	0.0099	0.0005	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00037	0.00040	0.00002	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0184	0.0184	0.332%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 815935) - continued											
TY2300662-001	Anonymous	Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	17.9	17.8	0.503%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00184	0.00182	0.00002	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.090	0.094	0.004	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	4.41	4.42	0.182%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00090	0.00095	0.00005	Diff <2x LOR	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000092	0.000088	0.000004	Diff <2x LOR	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.800	0.801	0.151%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00105	0.00107	0.00002	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000086	0.000067	0.000020	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.43	3.44	0.198%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	2.02	2.02	0.0849%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0184	0.0182	1.26%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000076	0.000076	0	Diff <2x LOR	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	0.00051	0.00001	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 813909)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 814616)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 814618)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Anions and Nutrients (QCLot: 814619)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 814620)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 814621)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 814622)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 814623)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Microbiological Tests (QCLot: 813867)						
Coliforms, Escherichia coli [E. coli]	----	E010	1	MPN/100mL	<1	----
Coliforms, total	----	E010	1	MPN/100mL	<1	----
Total Metals (QCLot: 814607)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 814607) - continued						
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 815935)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 815935) - continued						
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----





Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 813909)									
Turbidity	----	E121	0.1	NTU	200 NTU	101	85.0	115	----
Physical Tests (QCLot: 814616)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	200 mg/L	109	85.0	115	----
Physical Tests (QCLot: 814617)									
pH	----	E108	----	pH units	7 pH units	99.0	98.0	102	----
Physical Tests (QCLot: 814618)									
Conductivity	----	E100	1	µS/cm	447 µS/cm	98.2	90.0	110	----
Anions and Nutrients (QCLot: 814619)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 814620)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 814621)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 814622)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 814623)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Total Metals (QCLot: 814607)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	102	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	105	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	106	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.0125 mg/L	98.2	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.005 mg/L	103	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	0.05 mg/L	106	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	0.05 mg/L	93.2	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	101	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	2.5 mg/L	102	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.0025 mg/L	101	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.0125 mg/L	103	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.0125 mg/L	102	80.0	120	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit					
Total Metals (QCLot: 814607) - continued									
Copper, total	7440-50-8	E420	0.0005	mg/L	0.0125 mg/L	98.4	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	100	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	105	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.0125 mg/L	99.0	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	2.5 mg/L	101	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.0125 mg/L	103	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.0125 mg/L	106	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	101	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	0.5 mg/L	103	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	2.5 mg/L	103	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.005 mg/L	106	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	99.6	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	0.5 mg/L	103	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	98.3	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	2.5 mg/L	106	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.0125 mg/L	102	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	2.5 mg/L	104	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.005 mg/L	90.6	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	0.05 mg/L	104	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.005 mg/L	103	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	101	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.0125 mg/L	100	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.005 mg/L	104	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.00025 mg/L	106	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.025 mg/L	103	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	102	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.005 mg/L	104	80.0	120	----
Dissolved Metals (QCLot: 815935)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	0.1 mg/L	102	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	0.05 mg/L	101	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	0.05 mg/L	106	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.0125 mg/L	100	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.005 mg/L	99.4	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	0.05 mg/L	102	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	0.05 mg/L	106	80.0	120	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 815935) - continued									
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.005 mg/L	102	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	2.5 mg/L	104	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.0025 mg/L	97.4	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.0125 mg/L	103	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.0125 mg/L	100	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.0125 mg/L	98.9	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	0.05 mg/L	98.6	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.025 mg/L	101	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.0125 mg/L	102	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	2.5 mg/L	100	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.0125 mg/L	101	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.0125 mg/L	104	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.025 mg/L	101	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	0.5 mg/L	105	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	2.5 mg/L	103	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.005 mg/L	104	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	0.05 mg/L	97.1	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	0.5 mg/L	101	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.005 mg/L	92.6	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	2.5 mg/L	106	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.0125 mg/L	99.3	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	2.5 mg/L	103	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.005 mg/L	96.8	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	0.05 mg/L	100	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.005 mg/L	99.3	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.025 mg/L	101	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.0125 mg/L	99.2	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.005 mg/L	100	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.00025 mg/L	102	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.025 mg/L	103	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.025 mg/L	101	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.005 mg/L	101	80.0	120	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 814619)										
TY2300684-002	Well 3 GW	Nitrate (as N)	14797-55-8	E235.NO3	51.5 mg/L	50 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 814620)										
TY2300684-002	Well 3 GW	Nitrite (as N)	14797-65-0	E235.NO2	9.96 mg/L	10 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 814621)										
TY2300684-002	Well 3 GW	Sulfate (as SO4)	14808-79-8	E235.SO4	2060 mg/L	2000 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 814622)										
TY2300684-002	Well 3 GW	Chloride	16887-00-6	E235.Cl	2030 mg/L	2000 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 814623)										
TY2300684-002	Well 3 GW	Fluoride	16984-48-8	E235.F	21.0 mg/L	20 mg/L	105	75.0	125	----
Total Metals (QCLot: 814607)										
TY2300597-001	Anonymous	Aluminum, total	7429-90-5	E420	0.229 mg/L	0.2 mg/L	114	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0213 mg/L	0.02 mg/L	107	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0218 mg/L	0.02 mg/L	109	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0419 mg/L	0.04 mg/L	105	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0110 mg/L	0.01 mg/L	110	70.0	130	----
		Boron, total	7440-42-8	E420	0.098 mg/L	0.1 mg/L	97.7	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00448 mg/L	0.004 mg/L	112	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.0106 mg/L	0.01 mg/L	106	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0441 mg/L	0.04 mg/L	110	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0217 mg/L	0.02 mg/L	109	70.0	130	----
		Copper, total	7440-50-8	E420	0.0214 mg/L	0.02 mg/L	107	70.0	130	----
		Iron, total	7439-89-6	E420	2.14 mg/L	2 mg/L	107	70.0	130	----
		Lead, total	7439-92-1	E420	0.0218 mg/L	0.02 mg/L	109	70.0	130	----
		Lithium, total	7439-93-2	E420	0.112 mg/L	0.1 mg/L	112	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0228 mg/L	0.02 mg/L	114	70.0	130	----



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 814607) - continued										
TY2300597-001	Anonymous	Nickel, total	7440-02-0	E420	0.0432 mg/L	0.04 mg/L	108	70.0	130	----
		Phosphorus, total	7723-14-0	E420	10.9 mg/L	10 mg/L	109	70.0	130	----
		Potassium, total	7440-09-7	E420	4.29 mg/L	4 mg/L	107	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0219 mg/L	0.02 mg/L	109	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0425 mg/L	0.04 mg/L	106	70.0	130	----
		Silicon, total	7440-21-3	E420	9.98 mg/L	10 mg/L	99.8	70.0	130	----
		Silver, total	7440-22-4	E420	0.00431 mg/L	0.004 mg/L	108	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	21.1 mg/L	20 mg/L	105	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0402 mg/L	0.04 mg/L	100	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00431 mg/L	0.004 mg/L	108	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0223 mg/L	0.02 mg/L	112	70.0	130	----
		Tin, total	7440-31-5	E420	0.0213 mg/L	0.02 mg/L	106	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0427 mg/L	0.04 mg/L	107	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0213 mg/L	0.02 mg/L	107	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00453 mg/L	0.004 mg/L	113	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.109 mg/L	0.1 mg/L	109	70.0	130	----
		Zinc, total	7440-66-6	E420	0.439 mg/L	0.4 mg/L	110	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0438 mg/L	0.04 mg/L	109	70.0	130	----
Dissolved Metals (QCLot: 815935)										
TY2300662-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.199 mg/L	0.2 mg/L	99.4	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0379 mg/L	0.04 mg/L	94.7	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00933 mg/L	0.01 mg/L	93.3	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00395 mg/L	0.004 mg/L	98.8	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00939 mg/L	0.01 mg/L	93.9	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0406 mg/L	0.04 mg/L	101	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0198 mg/L	0.02 mg/L	99.2	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.95 mg/L	2 mg/L	97.7	70.0	130	----



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 815935) - continued										
TY2300662-002	Anonymous	Lead, dissolved	7439-92-1	E421	0.0199 mg/L	0.02 mg/L	99.4	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0999 mg/L	0.1 mg/L	99.9	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0214 mg/L	0.02 mg/L	107	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0403 mg/L	0.04 mg/L	101	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	10.1 mg/L	10 mg/L	101	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	4.03 mg/L	4 mg/L	101	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	9.11 mg/L	10 mg/L	91.1	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00385 mg/L	0.004 mg/L	96.2	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	1.98 mg/L	2 mg/L	99.0	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	0.0197 mg/L	0.02 mg/L	98.6	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	19.7 mg/L	20 mg/L	98.4	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0421 mg/L	0.04 mg/L	105	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00392 mg/L	0.004 mg/L	98.1	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0197 mg/L	0.02 mg/L	98.4	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0406 mg/L	0.04 mg/L	101	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00394 mg/L	0.004 mg/L	98.5	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.100 mg/L	0.1 mg/L	100	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.415 mg/L	0.4 mg/L	104	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0418 mg/L	0.04 mg/L	105	70.0	130	----



CCC Number = 22

Canada Toll Free: 1 800 668 9878

Page 1 of 1

Environmental Division

Thunder Bay

Work Order Reference

Work Order Reference
TY2300684



Telephone : + 1 807 523 6463

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REFER TO BACK PAGE FOR ALL S I LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY

YELLOW - CLIENT COPY

FFB 2022 FROM

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

Drop off

~~NO~~ 1 Cooker

Intake and Login Verification Form

Sample Intake			
Priority Service Requested	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		
Sample Count	2	# of Bottle Types	4
Comments on Samples and Bottles:			
Diss. Metals was Field Filtered and Preserved			
* 2nd pw related question not answered			
Matrix:	<input checked="" type="checkbox"/> Water	<input type="checkbox"/> Soil	<input type="checkbox"/> Air <input type="checkbox"/> Biota <input type="checkbox"/> Other
Client:	Tetra Tech		
Samples Requiring Preservation or Filtering:			
Total Metals needs to be Preserved @ Lab.			
SAMPLE RECEIPT INFORMATION			
Mode of Delivery:	Courier <input type="checkbox"/> Drop Off <input checked="" type="checkbox"/>		
COURIER			
Waybill Number			
Shipment Cost		Cooler Count	1
Cooling Method	None <input type="checkbox"/> Ice <input type="checkbox"/> Ice Packs <input checked="" type="checkbox"/>		
DRINKING WATER SAMPLE CHECK			
Schedule 24 Bottles Correct upon Receipt	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Metals pH Check <2	Yes <input type="checkbox"/> N/A <input type="checkbox"/>		
Layout Staff Initials	W	Date and Time of Layout	
		1/25/23 9:10	

Login and Verification		
Confirmed all as accurate as per COC, Account Notes or PM		
CLIENT <input checked="" type="checkbox"/>	OFFICE <input checked="" type="checkbox"/>	CONTACT <input checked="" type="checkbox"/> QUOTE <input checked="" type="checkbox"/> PROJECT <input checked="" type="checkbox"/> PO <input checked="" type="checkbox"/>
Site number matches LSD on COC or Account Notes		Y/N <input checked="" type="checkbox"/>
REPORTS		
Recipients match COC or Account Notes	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
COMMENTS - Visible By Client		
Sample Issues identified	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
REMARKS - Internal Communication		
Sample Issues/Info Communicated	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
SAMPLE DETAILS		
Sample Name and time entered as per COC	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Containers selected in order of COC	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sales Items from QUOTE ONLY	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
BOTTLE ALLOCATION VERIFICATION	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
GUIDELINE ADDED AS REQUIRED	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Field Data/Calc Codes removed- not on COC	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Validation		
No Issues displayed upon Validation/Committal	Y/N <input checked="" type="checkbox"/>	
COC and Internal COC created	Y/N <input checked="" type="checkbox"/>	

Login Staff Initials	AN
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