Hydrogeologic Memo

To: **The Town of Radisson**
329 Main Street
PO Box 69
Radisson, SK S0K 3L0

Attention: **Norma Stumborg - Administrator**

Date: **25 September 2024**

Re: **Radisson Lagoon Regional Hydrogeologic Characterization, Radisson, SK**

1. INTRODUCTION & BACKGROUND

PINTER & Associates Ltd. (PINTER) is pleased to provide this technical memorandum (Tech Memo) to the Town of Radisson (the Client) based on the review of the available physiographic information of the area surrounding the existing wastewater lagoon and the proposed Lagoon expansion area. The Lagoon is located approximately 400 m south of Radisson, at SW-21-40-10-3. The lagoon expansion is proposed to be developed in the land immediately to the east of the existing lagoon on the same quarter section of the land (the Site).

Based on the information provided to PINTER, the Client has encountered issues with the Lagoon due to the undersize of its current capacity, and population growth. The Client wishes to remediate this problem by expanding its wastewater treatment capacity and remediating any underlying issues with the existing Lagoon to allow future developments that will support its economic growth.

The construction of the lagoon expansion started in August 2024; however, it was interrupted due to wet soil conditions found at the site area during the soil stripping. The situation demanded a reassessment of the lagoon expansion design and location since the clay soil encountered during excavation would not achieve ideal compaction with the observed degree of saturation found at the Site. Additionally, PINTER collected groundwater samples from test pits dug in the expansion

area to investigate if the lagoon cell is potentially contaminating the shallow groundwater in the area.

This report presents a review of the regional hydrology and hydrogeology of the area surrounding the proposed lagoon expansion, characterizes the subsoil conditions of the area, and serves as a guide to the design re-evaluation of the lagoon cell.

2. SITE CHARACTERIZATION

2.1 Topography and Drainage

The Site is located on the Hafford Plain of the Aspen Parkland ecoregion of the prairies. The landscape is dominated by undulating to gently rolling plains dominated by sandy and gravelly till deposits of glaciofluvial and glaciolacustrine origin. Local sand dunes occur within the landscape zone. The region has a relief of approximately 40 m, sloping southeast from over 530 metres above sea level (mASL) north of the Town of Radisson to about 490 mASL near the North Saskatchewan River.

The external regional drainage of the region is very limited, and the main natural drainage feature is Shepard Creek, located approximately 3 km southeast of the Site, which drains east towards the North Saskatchewan River. Overall, the regional drainage is controlled by wetlands that accumulate surficial drainage from precipitation and snowmelt, and that often receive contribution from shallow groundwater inflow. Unless human-made drainage ditches or structures are present, the surficial runoff from one wetland to the other is dependent on the climate and the local topography. Usually, during wet years or heavy storm events, a “fill-and-spill” process occurs where the wetland “basin” fills and the extra water spills to the next wetland following the area’s topography. In drought or dry periods, these wetlands may disappear completely or be maintained only by groundwater inflow.

Locally, the lagoon expansion area is marked by a topographic low that intersects the Site from the northwest to the southeast. The Site elevations range from about 521.5 mASL at the east edge

of the site adjacent to the existing lagoon to approximately 520.5 mASL at the southeast end of the topographic low at the point where a culvert is installed under the south grid road.

Historical satellite imagery and topographic charts indicate the presence of an intermittent drainage channel in this low area which likely conveys water from a wetland just north of the Site toward the land to the south of the Site. Also, the historical imagery indicates the lowland area is a wetland as suggested by the water accumulation during springtime or wet years. Figure 2.1 shows the interpreted drainage and wetland system of the Site.

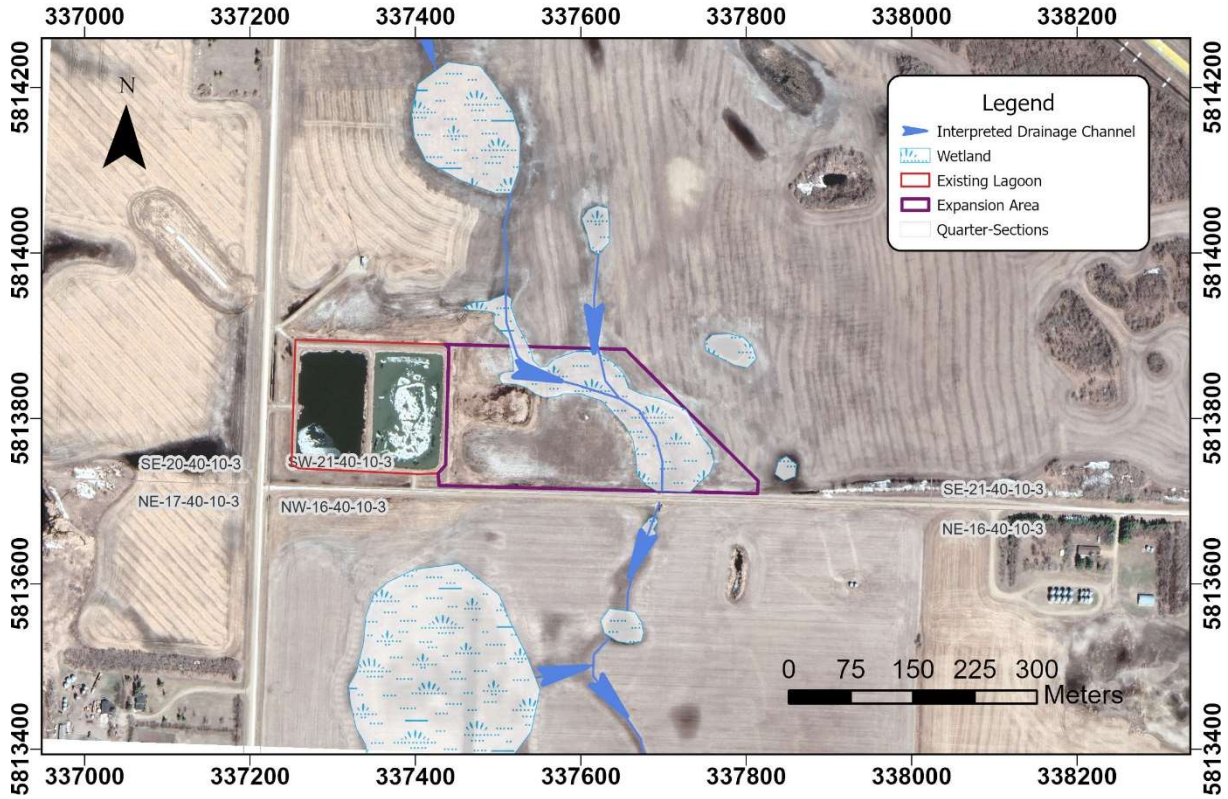

Figure 2.1 – Interpreted wetlands and drainage flow for the area surrounding the existing lagoon and proposed expansion area.

2.2 Regional Geology & Hydrogeology

The regional geology and hydrogeology were interpreted from the Hydrogeology Mapping of the NTS Mapsheet Saskatoon 73B (MDH, 2011) and the water well records available in the WSA's

Water Well Driller's Record Database (WWDR Database). The regional geology around the Site is characterized by Quaternary drift sediments deposited over Cretaceous marine deposits of the bedrock.

The Quaternary drift configures the shallow stratigraphy of the area (down to 50 m below ground surface), and these deposits represent the focus of this site characterization, as deeper stratigraphic formations are most likely not impacted by the lagoon expansion construction and operation. These deposits belong to the Saskatoon Group, which represents the portion of the drift lying between the Sutherland Group and the topographic surface. A summary of the shallow stratigraphic units identified in the region is presented below:

Surficial Stratified Deposits (SSD) – the SSD comprises the post-glacial sediments including fluvial, lacustrine, aeolian, and topsoil deposits that originate from modern depositional environments. A Glaciolacustrine Plain and a Glaciofluvial Outwash Plain configure the main environmental depositional systems of the area. Sandy and gravelly tills interbedded with coarser sediment layers associated with these depositional environments are expected to occur at surficial levels in the study area.

A complex arrangement of gravels, sands, silts, and clay deposits of the SSD configure a relatively continuous aquifer in the area. These deposits are informally named Surficial Aquifer (MDH, 2011). They have an interpreted thickness of 5 m around the Radisson area and the thickness increases eastward to more than 20 m around the outskirts of Saskatoon. Figure 2.2 shows the areal extent of the Surficial Aquifer around the study area.

The groundwater flow within the Surficial Aquifer is heavily influenced by the surficial topography, and the recharge of the aquifer is controlled by the infiltration of meteoric water. Based on the regional topography, groundwater flow in this area should occur to the east or southeast direction towards Shepards Creek and the North Saskatchewan River. The groundwater level observed in wells and boreholes completed in this formation is commonly referred to as the groundwater table.

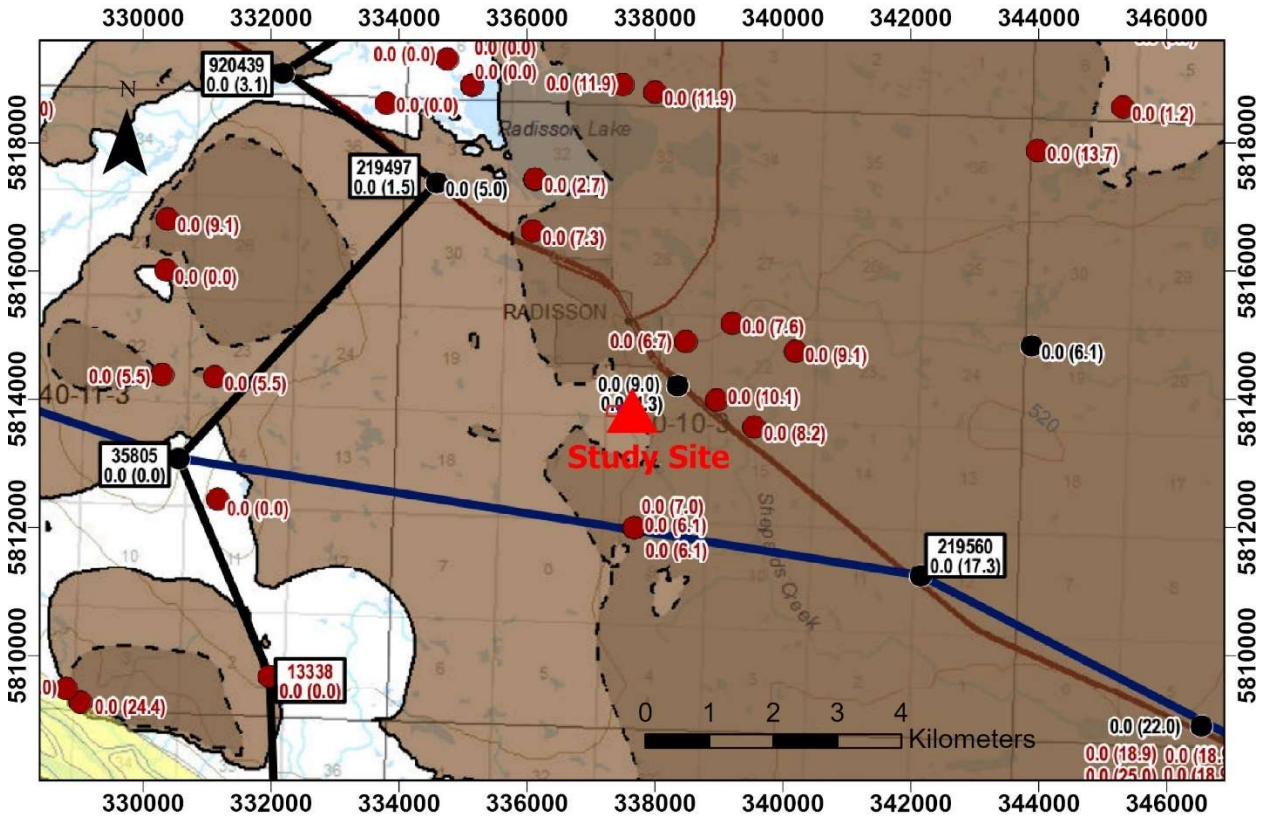

Figure 2.2 – Surficial Aquifer areal extents (in brown) around the study site. The dashed line represents the 5 m isopach for the aquifer.

Battleford Formation and Floral Formation – The Battleford Formation is composed of soft, oxidized till deposited by glacial process during the last glaciation period. The Floral Formation comprises firm, low to high plasticity, silt till layers interbedded with intertill stratified deposits of coarser sediments such as gravel, sand and silt. The upper portion of the Floral Formation is fractured and strongly oxidized and is usually differentiated from the Battleford Formation tills by its consistency and fractured nature. The bottom of the Floral Formation is interpreted to occur at approximately 35 m below the ground surface.

Stratified gravel and sand sediments at the contact of the Battleford and Floral Formation represent the Battleford Aquifer in the region (MDH, 2011). This aquifer is discontinuous over the Saskatoon Mapsheet region with some limited, localized areas tapped as a groundwater source. The groundwater flow regime of the Battleford Aquifer usually follows the local topography, and

the flow direction is usually focused on local sloughs and depressions. Recharge is controlled by infiltration. An extension of the Battleford Aquifer is mapped approximately 1.5 km northwest of the proposed lagoon site (Figure 2.3). The aquifer is interpreted to occur at a depth of approximately 10 m below the surface with a thickness of approximately 2 m.

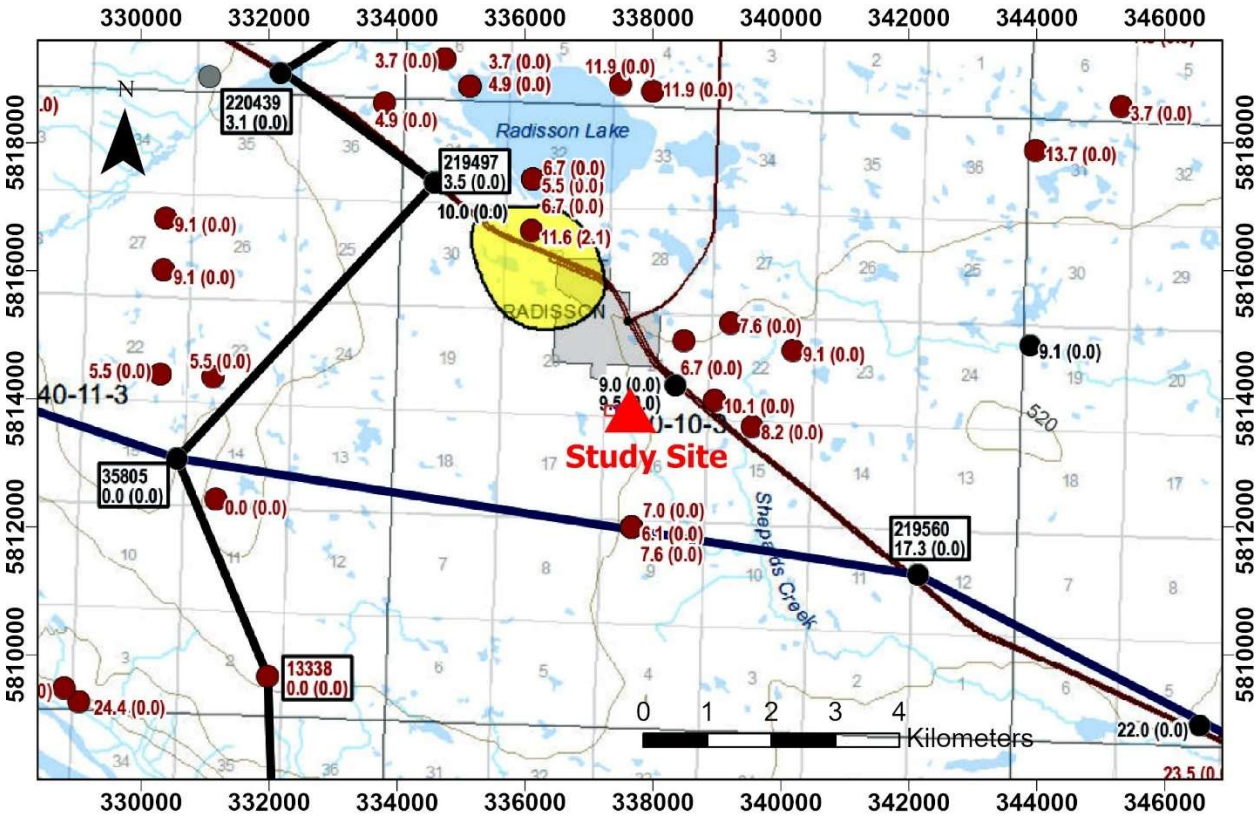

Figure 2.3 – Battleford Aquifer areal extents (in yellow) around the study site.

Interbedded stratified deposits that occur at the contact between the Sutherland and the Saskatoon Groups configure the Lower Floral Aquifer and the Upper Floral Aquifer based on their stratigraphic position relative to the interbedded till layers. At several locations in the Saskatoon Mapsheet area, these aquifers are hydraulically connected and differentiation between them is very difficult due to the lithologic similarities. At these locations, the connected aquifers form important regional aquifers formally named: the Fielding Aquifer, the Dalmeny Aquifer, the Tessier Aquifer, and the Forestry Farm Aquifer.

The regional maps show the Fielding Aquifer occurs approximately 4.5 km northwest of the study site (Figure 2.4). It is interpreted to occur at a depth of approximately 20 m in the Radisson Lake area with a thickness ranging from 5 m to more than 20 m as the aquifer extends to the northwest towards the town of Fielding.

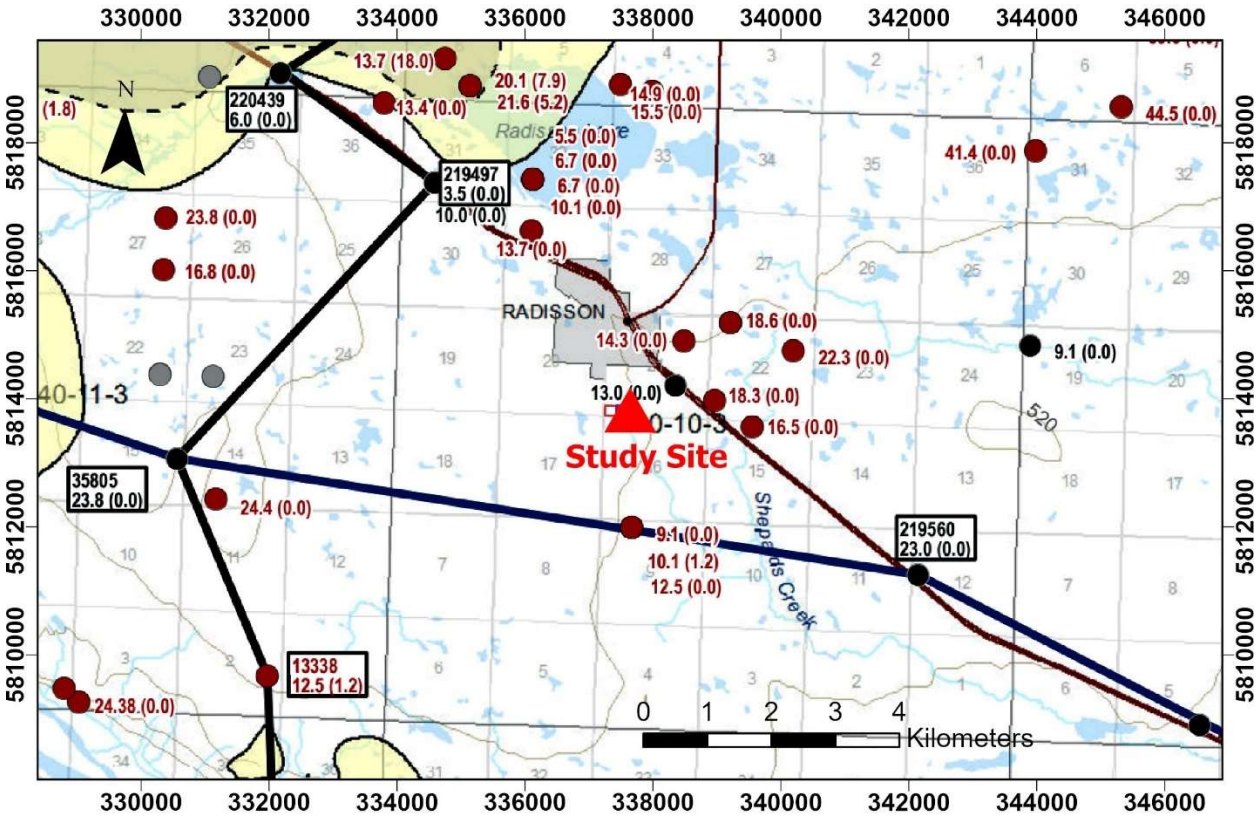

Figure 2.4 – The Fielding Aquifer areal extent (in yellow) around the study site.

Groundwater recharge of the Floral Aquifers occurs through infiltration of the meteoric water and vertical flow through the sediments of the SSD and Battleford Formation, including the aquifers found in these formations. The lateral groundwater flow of the Fielding Aquifer is towards the North Saskatchewan River, where it discharges as springs along the valley walls.

2.3 Water Well Records

A neighbouring well inventory was completed using the Water Well Driller's Record Database. Table 2.1 presents the neighbouring wells and yard sites identified in a 5 km radius of the Site.

Table 2.1 – Groundwater supply wells identified within a 5 km radius of the Site and with a completion depth of less than 30 m.

WWDR	Well Name	Legal Land Location	Distance from site (km)	Water Use	Borehole Depth (m)	Water level (mbtoc)	Aquifer Completion
35694	Hamilton	20-40-10-3	1.1	Domestic	6.1	2.1	Surficial
35698	Radisson Motors	20-40-10-3	1.1	Domestic	9.8	-	Battleford
35693	Glen	20-40-10-3	1.1	Domestic	18.3	7.6	Battleford
35699	Stott	20-40-10-3	1.1	Domestic	11.0	4.9	Battleford
35701	Racine	NE-20-40-10-3	1.2	Domestic	5.5	4.3	Surficial
57217	Kindt	NE-21-40-10-3	1.3	Domestic	16.5	-	Battleford
35691	Hunter	NW-15-40-10-3	1.5	Domestic	6.1	3.4	Surficial
35709	Anglo Amer Explor	SW-28-40-10-3	1.9	Domestic	11.0	4.6	Battleford
35710	Anglo Amer Explor	SW-28-40-10-3	2.0	Domestic	11.0	6.1	Battleford
14523	Amson	SE-28-40-10-3	2.0	Domestic	11.6	2.4	Battleford
35704	Lommer	22-40-10-3	2.0	Domestic	27.4	16.8	Floral
35692	Brigham	NE-19-40-10-3	2.3	Domestic	3.7	1.5	Surficial
65285	Myers	SW-27-40-10-3	2.4	Domestic	9.1	1.2	Battleford
65297	Myers	SW-27-40-10-3	2.5	Domestic	9.1	1.2	Battleford
35690	McKellar	NW-08-40-10-3	2.5	Domestic	7.9	5.5	Surficial
49698	Harach	SW-09-40-10-3	2.9	Domestic	13.7	-	Battleford
65296	Amson	NW-27-40-10-3	3.1	Domestic	27.1	16.8	Floral
63024	Genereux	NE-30-40-10-3	3.4	Domestic	11.0	1.8	Battleford
14524	Amson	SW-33-40-10-3	3.5	Domestic	28.7	21.6	Floral
35688	Maxwell	SE-07-40-10-3	3.5	Domestic	9.1	-	Battleford
94315	Pidwerbesky	NE-05-40-10-3	3.6	Domestic	9.4	-	Battleford
35686	RM of Great Bend	NE-05-40-10-3	3.7	Municipal	3.7	1.8	Surficial
118661	Garrett	SE-14-40-10-3	4.0	Domestic	15.8	4.6	Battleford

A total of 23 groundwater supply wells with a depth of less than 30 m were identified within a 5 km radius of the Site. Of these, six (6) wells were completed in the Surficial Aquifer, 14 in the Battleford Aquifer, and three (3) in the Floral Aquifer. The groundwater level in the wells completed within the Surficial Aquifers varies between 1.5 m and 5.0 m below the surface.

2.4 Local Geology & Hydrogeology

P. Machibroda Engineering Ltd. (PMEL) completed a geotechnical study for the proposed expansion area in 2009 and a total of six (6) test holes were drilled. Later, on 29 April 2024, PINTER performed a drilling investigation on the existing lagoon berms to characterize the construction material and the lagoon substrate. On 19 July 2024, PINTER performed a field investigation to confirm the soil condition listed in PMEL report. In total, PINTER drilled three (3) boreholes around the existing lagoon berm and one (1) additional borehole in the lagoon expansion area.

In general, the shallow stratigraphy of the Site consists of a thin layer of topsoil, ranging from 50 mm to 300 mm in thickness, overlying a silty clay deposit extending to depths of 5.5 m to 6.3 m below the ground surface. A clay till unit underlies the silty clay deposit. In almost all boreholes, the clay till unit extended to the full depth of the test hole, except for one borehole, drilled by PMEL (TH 09-1), where a sand layer was found at a depth of 8.9 m.

Four (4) piezometers were installed in the lagoon expansion area: three (3) by PMEL and one (1) by PINTER. Groundwater levels ranged from the surface level at the southwest corner of the expansion area to 1.2 m below the surface at the northeast portion of the Site. These shallow water levels are expected to occur in lowland areas such as where the Site is located, as discussed in Section 2.1.

Given that the lagoon has been in operation for more than 50 years, the groundwater regime underneath the cells may have been changed by the lagoon. Even with a liner, wastewater lagoons will always allow some infiltration to seep into the groundwater. At locations with shallow groundwater, the infiltration may create a groundwater “mound” around the lagoon, locally increasing the groundwater level. The longer a lagoon has been in operation, the more pronounced may be the rise of the local groundwater level.

2.5 Groundwater Sampling and Lagoon Leakage Analysis

The local contractor excavated nine (9) test pits to investigate the composition of the soil and water table in the proposed expansion area. PINTER personnel completed a GPS survey of the test pit locations and collected seven (7) water samples, from selected test pits and from the lagoon secondary cell, to compare water quality composition and investigate if any potential leakage is occurring and contaminating the local groundwater. Figure 2.5 shows the location of the test pits and sampled locations.

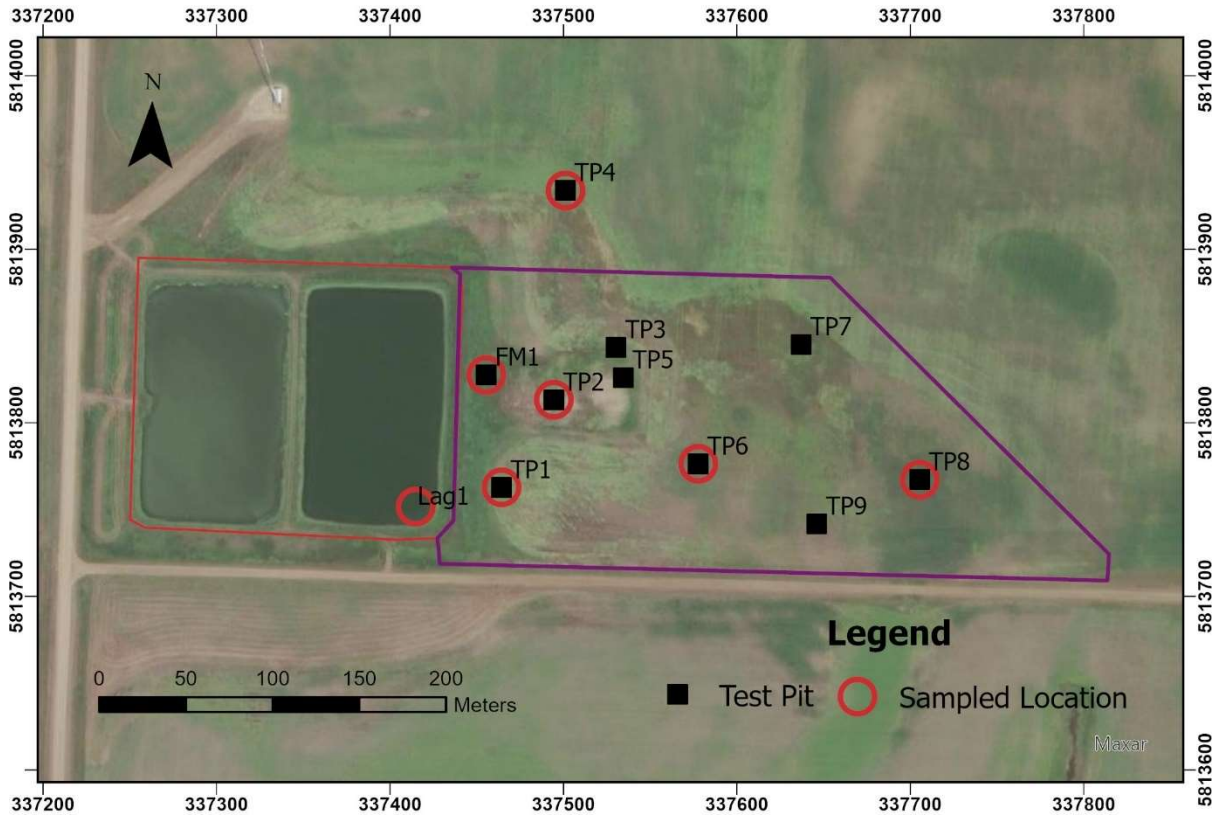

Figure 2.5 – Test pits and water sampling locations.

The samples were collected on 23 August 2024 and submitted to ALS Environmental Laboratory in Saskatoon. All samples were analyzed for Routine analysis. The laboratory certificate of analysis is available in Appendix A. The sample from the secondary lagoon cell (Lag1) was collected at a shallow level while the sampled test pits had the accumulated water collected once they were filled in. A summary of the results is presented in Table 2.2.

Table 2.2 – Summary of the water chemistry results of the samples collected on 23 August 2024.

Sample Location	LAG1	FM1	TP2	TP1	TP4	TP6	TP8
Physical Tests							
Conductivity	3030	4930	8000	5660	8930	9180	5240
Alkalinity, bicarbonate (as HCO3)	552	988	922	1050	856	652	346
Alkalinity, carbonate (as CO3)	9.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as OH)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	468	810	755	860	701	534	283
Hardness (as CaCO3), dissolved	998	1890	3070	2450	4640	4190	2640
Solids, total dissolved [TDS], calculated	1980	3370	6390	4190	7940	8540	3960
pH	8.42	7.76	7.99	7.84	7.91	8.09	7.77
Anions and Nutrients							
Chloride	449	911	886	936	1130	535	941
Nitrate (as N)	<0.400	<0.400	<1.00	<1.00	<1.00	<1.00	0.876
Nitrate + Nitrite (as N)	<0.447	<0.447	<1.12	<1.12	<1.12	<1.12	0.876
Nitrite (as N)	<0.200	<0.200	<0.500	<0.500	<0.500	<0.500	<0.200
Sulfate (as SO4)	600	904	3150	1490	4190	5320	1680
Metals							
Calcium, dissolved	154	317	454	314	508	410	561
Iron, dissolved	0.102	<0.050	<0.100	<0.050	<0.100	<0.100	<0.050
Magnesium, dissolved	149	267	470	404	820	768	300
Manganese, dissolved	0.678	1.45	0.348	0.00126	0.0325	0.00875	0.00964
Potassium, dissolved	21.3	7.50	42.3	9.14	12.1	14.3	41.7
Sodium, dissolved	288	460	916	503	822	1140	238

Figure 2.6 shows a Stiff diagram comparing the major ion components tested in the water samples collected at the site. In general, Figure 2.6 and Table 2.2 indicate that there is no correlation between the water in the storage cell and the water collected from the test pits. However, these results represent a snapshot of the water quality when the samples were connected and should not be taken as an indication that the lagoon is leaking.

The water from the storage cell is likely affected by dilution caused by precipitation over the cell and from the deposition of solids at the bottom of the lagoon. Groundwater usually has high amounts of total dissolved solids due to its nature; as the water moves through the soil, it dissolves the minerals and organic compounds of the soil and adds them to the water composition in the form of ions and organic molecules. Therefore, the parameters analyzed in this investigation do not provide sufficient information to indicate if the lagoon is leaking or contaminating the local groundwater. The results are inconclusive on that matter.

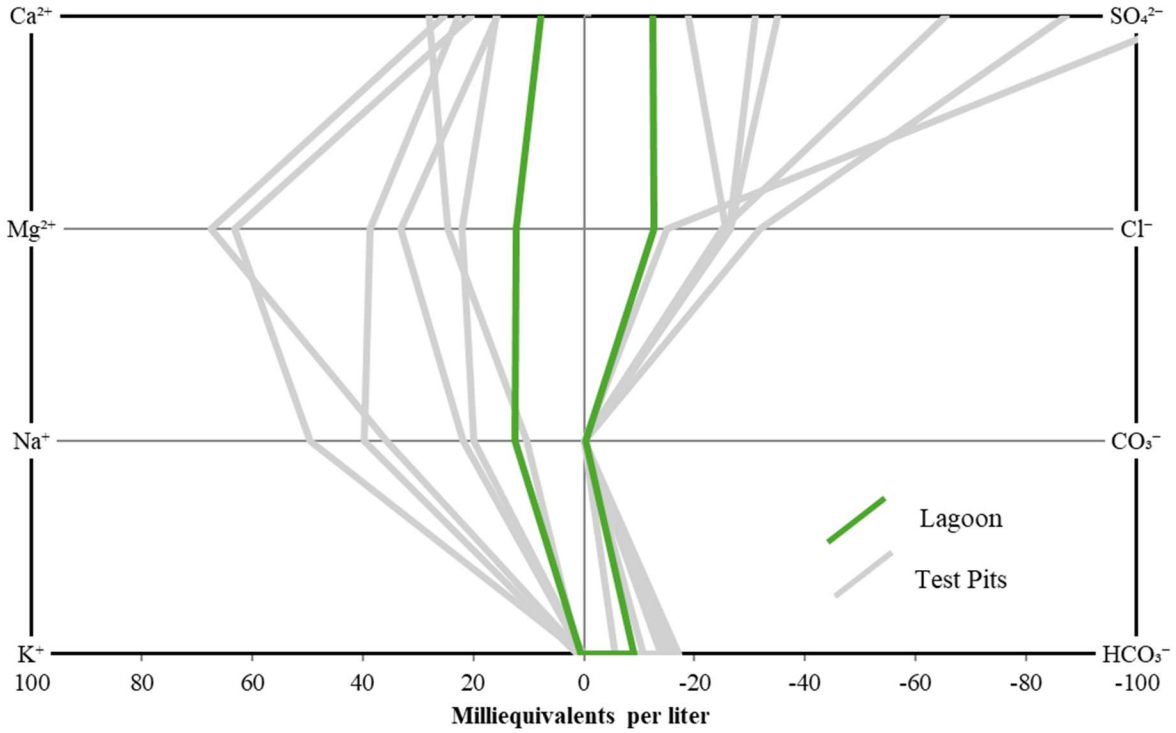

Figure 2.6 – Stiff diagram comparing the composition of the water collected in the lagoon and test pits.

The most common parameters associated with wastewater quality are Biochemical Oxygen Demand (BOD5), Total Suspended Solids (TSS), Total Phosphorous (Total P), Total Nitrogen (Total N), and microorganisms such as bacteria, viruses, and parasites which are usually identified by testing the groundwater for Total and Fecal coliforms content. At least some of these parameters, if not all, should be tested from samples collected from both lagoon cells and the groundwater.

The groundwater samples should be collected at additional locations surrounding the lagoon cells in every direction, so a groundwater gradient can be established and potential changes to the chemical composition of the groundwater after passing through the lagoon can be identified, if any. Also, shallow monitoring wells should be installed to conduct groundwater sampling and measure water levels.

3. SUMMARY AND RECOMMENDATIONS

A summary of the findings of this desktop study is presented as follows:

- The Site is located at a regional topographic low. Historical satellite images suggest that the eastern portion of the Site is a wetland and part of an intermittent creek channel that conveys water from other wetlands to the north of the Site towards Shepard Creek, which is approximately 3 km southeast of the Site.
- The region's geology is mainly comprised of topsoil and interbedded deposits of clay, silt, and sand overlying glacial till. Glacial silt, sand, and gravel stratified deposits within the till layers may form local and regional aquifers which are used as groundwater supply sources in the area.
    - A total of 23 groundwater supply wells with a depth of less than 30 m were identified within a 5 km radius of the Site. Eight (8) of these are within a 2 km radius. The aquifers in the completion zone of these wells may be affected by contamination caused by the wastewater stored in the lagoon cells.
- The water table in the study area was measured at different dates, and it is interpreted to occur at a range varying from surface level to 1.2 m below the surface.
    - The water table is not a static water level and will fluctuate according to the seasons and the weather; high water table levels are expected during spring melt and following long periods of precipitation, and lower levels are expected during winter or drought periods.
    - The local water table is potentially affected by the lagoon operation. A groundwater "mound" may have been developed around the lagoon caused by seepage over more than 50 years of operation.
- The water samples collected to investigate if there is contamination of groundwater were inconclusive.

The shallow groundwater table and low topographic elevations of the proposed expansion area are the main challenges for the construction of the expansion cell. Ideally, a location with a deeper water table, i.e., deep enough that the bottom of the lagoon cells is above the water table level, would be recommended since the lagoon design would be simpler and potentially less expensive. However, the construction of the expansion cell at the proposed location would be possible if considering the following:

- The lagoon design requires dewatering of the local soil to lower the water table at the lagoon location during construction and operation of the lagoon.
    - Temporary dewatering is recommended during construction to keep the site dry allowing the operation of equipment and providing dry soil conditions to build the lagoon and liner (if using a clay liner).
    - A permanent dewatering system would be recommended to keep the water table levels at a safer distance from the bottom of the lagoon to avoid flotation of the membrane liner or introducing additional water to the lagoon, affecting the required storage volume and treatment efficiency.
- The lagoon expansion cell should be built with a liner to reduce seepage into the shallow groundwater table and potential contamination of the shallow aquifers in the area.
    - The liner can be built with clay or synthetic materials as long as it can meet the maximum exfiltration (seepage) rate of 150 mm per year per WSA guidelines.
- A piezometer monitoring network should be established around the existing and proposed lagoon cells to monitor the seasonal fluctuations of the groundwater, as well as to establish baseline information for the groundwater quality around the area. Also, the groundwater monitoring would provide information on existing contamination, if any.
    - A minimum of four (4) piezometers should be installed around the treatment lagoon. One (1) piezometer should be located upstream of the groundwater gradient to establish the baseline groundwater conditions. A minimum of three (3) piezometers should be

installed downstream of the lagoon to monitor for potential contamination and groundwater level changes.

  - At least three (3) additional piezometers may be necessary to fully comprehend the local groundwater table and geochemistry.

- Groundwater samples should be collected at each lagoon cell and piezometers. The samples should be tested for Biochemical Oxygen Demand (BOD5), Total Suspended Solids (TSS), Total Phosphorous (Total P), Total Nitrogen (Total N), and Total and Fecal Coliforms to monitor potential contamination.
- The expansion lagoon design should include recommendations for a runoff drainage diversion to convey the runoff from the north side of the area around the lagoon cell towards the lowland area to the east, and eventually to the culvert under the southern grid road.

  - A hydrologic study to evaluate the Site's drainage and flood potential may be required if flooding is expected to occur in the area adjacent to the proposed expansion area. Building the new cell will change the existing topography which may affect the current drainage system around the Site.
  - Erosion protection considerations should be included in the lagoon design to prevent damage in the event of flooding.

4. STATEMENT OF LIMITATIONS

This memorandum has been prepared for the exclusive use of **The Town of Radisson.** Any use of this report by a third party or any reliance on or decisions to be made based on it is the responsibility of such third parties. PINTER & Associates Ltd. accepts no responsibility for damages, if any, suffered by any third parties as a result of decisions made or actions taken based on this memorandum.

Sincerely,

PINTER & Associates Ltd.

Per:

Rafael Beruski, P. Geo.
Water Resources Consultant

Reviewed by:

Nyamaa Jalbuu, P.Eng.
Project Engineer

Date: 25 September 2024

PINTER & ASSOCIATES LTD

Appendix A

Certified Laboratory Results

CERTIFICATE OF ANALYSIS

Work Order	: **SK2404542**	Page	: 1 of 5
Client	: **PINTER & Associates Ltd.**	Laboratory	: ALS Environmental - Saskatoon
Contact	: Cassidy Salik	Account Manager	: Kimberley Head
Address	: 710A 48 Street East Saskatoon SK Canada S7K 5B4	Address	: 819 58 Street East Saskatoon SK Canada S7K 6X5
Telephone	: 306 244 1710	Telephone	: +1 306 668 8370
Project	: 3285-1	Date Samples Received	: 23-Aug-2024 15:24
PO	: 3285-1	Date Analysis Commenced	: 23-Aug-2024
C-O-C number	: ----	Issue Date	: 29-Aug-2024 21:08
Sampler	: TC		
Site	: Town of Raddison - WTP Upgrade		
Quote number	: 2024 rates		
No. of samples received	: 3		
No. of samples analysed	: 3		

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*
Colby Bingham	Laboratory Supervisor	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Laboratory Supervisor	Metals, Saskatoon, Saskatchewan
Milad Khani	Laboratory Analyst	Inorganics, Saskatoon, Saskatchewan
Milad Khani	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Ruth Islas	Laboratory Assistant	Metals, Saskatoon, Saskatchewan

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).
Measurement Uncertainty: The reported uncertainties in this report are expanded uncertainties calculated using a coverage factor of 2, which gives a level of confidence of approximately 95%.
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.

Unit	*Description*
-	no units
%	percent
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.

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.

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	SK ALS Environmental - Saskatoon	819 58 Street East, Saskatoon, SK

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
SFP	*Sample was filtered and preserved at the laboratory.*

Analytical Results

SK2404542-001

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: TP2

Client sampling date / time: 23-Aug-2024 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot
Physical Tests									
Hardness (as CaCO3), dissolved	----	3070	-	0.50	mg/L	EC100/SK	-	29-Aug-2024	-
Conductivity	----	8000	± 161	2.0	µS/cm	E100/SK A	24-Aug-2024	24-Aug-2024	1614558
pH	----	7.99	± 0.04	0.10	pH units	E108/SK A	24-Aug-2024	24-Aug-2024	1614557
Alkalinity, bicarbonate (as HCO3)	71-52-3	922	-	1.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Alkalinity, carbonate (as CO3)	3812-32-6	<1.0	-	1.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	-	1.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Alkalinity, total (as CaCO3)	----	755	± 24.5	2.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Solids, total dissolved [TDS], calculated	----	6390	-	1.0	mg/L	EC103/SK	-	26-Aug-2024	-
Anions and Nutrients									
Chloride	16887-00-6	886	± 52.9	25.0	mg/L	E235.Cl/SK A	24-Aug-2024	24-Aug-2024	1614655
Nitrate (as N)	14797-55-8	<1.00 DLDS	-	1.00	mg/L	E235.NO3/SK A	24-Aug-2024	24-Aug-2024	1614653
Nitrite (as N)	14797-65-0	<0.500 DLDS	-	0.500	mg/L	E235.NO2/SK A	24-Aug-2024	24-Aug-2024	1614656
Sulfate (as SO4)	14808-79-8	3150	± 169	15.0	mg/L	E235.SO4/SK A	24-Aug-2024	24-Aug-2024	1614654
Nitrate + Nitrite (as N)	----	<1.12	-	1.12	mg/L	EC235.N+N/SK	-	26-Aug-2024	-
Ion Balance									
Anion sum	----	106	-	0.10	meq/L	EC101/SK	-	26-Aug-2024	-
Cation sum	----	102	-	0.10	meq/L	EC101/SK	-	26-Aug-2024	-
Ion balance (APHA)	----	-1.92	-	0.01	%	EC101/SK	-	26-Aug-2024	-
Ion balance (cations/anions)	----	96.2	-	0.010	%	EC101/SK	-	26-Aug-2024	-
Dissolved Metals									
Calcium, dissolved	7440-70-2	454	± 32.2	0.500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Iron, dissolved	7439-89-6	<0.100 DLDS	-	0.100	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Magnesium, dissolved	7439-95-4	470	± 38.0	0.0500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Manganese, dissolved	7439-96-5	0.348	± 0.0255	0.00100	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Potassium, dissolved	7440-09-7	42.3	± 3.24	0.500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Sodium, dissolved	7440-23-5	916	± 77.0	0.500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Dissolved metals filtration location	----	Laboratory SFP	-	-	-	EP421/SK	-	28-Aug-2024	1618729

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

SK2404542-002

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: LAG1

Client sampling date / time: 23-Aug-2024 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot
Physical Tests									
Hardness (as CaCO3), dissolved	----	998	-	0.50	mg/L	EC100/SK	-	29-Aug-2024	-
Conductivity	----	3030	± 61.7	2.0	µS/cm	E100/SK A	24-Aug-2024	24-Aug-2024	1614558
pH	----	8.42	± 0.04	0.10	pH units	E108/SK A	24-Aug-2024	24-Aug-2024	1614557
Alkalinity, bicarbonate (as HCO3)	71-52-3	552	-	1.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Alkalinity, carbonate (as CO3)	3812-32-6	9.5	-	1.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	-	1.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Alkalinity, total (as CaCO3)	----	468	± 15.3	2.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Solids, total dissolved [TDS], calculated	----	1980	-	1.0	mg/L	EC103/SK	-	26-Aug-2024	-
Anions and Nutrients									
Chloride	16887-00-6	449	± 26.8	10.0	mg/L	E235.Cl/SK A	24-Aug-2024	24-Aug-2024	1614655
Nitrate (as N)	14797-55-8	<0.400 DLDS	-	0.400	mg/L	E235.NO3/SK A	24-Aug-2024	24-Aug-2024	1614653
Nitrite (as N)	14797-65-0	<0.200 DLDS	-	0.200	mg/L	E235.NO2/SK A	24-Aug-2024	24-Aug-2024	1614656
Sulfate (as SO4)	14808-79-8	600	± 32.2	6.00	mg/L	E235.SO4/SK A	24-Aug-2024	24-Aug-2024	1614654
Nitrate + Nitrite (as N)	----	<0.447	-	0.447	mg/L	EC235.N+N/SK	-	26-Aug-2024	-
Ion Balance									
Anion sum	----	34.5	-	0.10	meq/L	EC101/SK	-	26-Aug-2024	-
Cation sum	----	33.0	-	0.10	meq/L	EC101/SK	-	26-Aug-2024	-
Ion balance (APHA)	----	-2.22	-	0.01	%	EC101/SK	-	26-Aug-2024	-
Ion balance (cations/anions)	----	95.6	-	0.010	%	EC101/SK	-	26-Aug-2024	-
Dissolved Metals									
Calcium, dissolved	7440-70-2	154	± 11.0	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Iron, dissolved	7439-89-6	0.102	± 0.008	0.050	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Magnesium, dissolved	7439-95-4	149	± 12.1	0.0250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Manganese, dissolved	7439-96-5	0.678	± 0.0497	0.00050	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Potassium, dissolved	7440-09-7	21.3	± 1.63	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Sodium, dissolved	7440-23-5	288	± 24.2	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Dissolved metals filtration location	----	Laboratory SFP	-	-	-	EP421/SK	-	28-Aug-2024	1618729

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

SK2404542-003

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: FM1

Client sampling date / time: 23-Aug-2024 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot
Physical Tests									
Hardness (as CaCO3), dissolved	----	1890	-	0.50	mg/L	EC100/SK	-	29-Aug-2024	-
Conductivity	----	4930	± 99.7	2.0	µS/cm	E100/SK A	24-Aug-2024	24-Aug-2024	1614558
pH	----	7.76	± 0.04	0.10	pH units	E108/SK A	24-Aug-2024	24-Aug-2024	1614557
Alkalinity, bicarbonate (as HCO3)	71-52-3	988	-	1.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Alkalinity, carbonate (as CO3)	3812-32-6	<1.0	-	1.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	-	1.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Alkalinity, total (as CaCO3)	----	810	± 26.3	2.0	mg/L	E290/SK A	24-Aug-2024	24-Aug-2024	1614559
Solids, total dissolved [TDS], calculated	----	3370	-	1.0	mg/L	EC103/SK	-	26-Aug-2024	-
Anions and Nutrients									
Chloride	16887-00-6	911	± 54.4	10.0	mg/L	E235.Cl/SK A	24-Aug-2024	24-Aug-2024	1614655
Nitrate (as N)	14797-55-8	<0.400 DLDS	-	0.400	mg/L	E235.NO3/SK A	24-Aug-2024	24-Aug-2024	1614653
Nitrite (as N)	14797-65-0	<0.200 DLDS	-	0.200	mg/L	E235.NO2/SK A	24-Aug-2024	24-Aug-2024	1614656
Sulfate (as SO4)	14808-79-8	904	± 48.6	6.00	mg/L	E235.SO4/SK A	24-Aug-2024	24-Aug-2024	1614654
Nitrate + Nitrite (as N)	----	<0.447	-	0.447	mg/L	EC235.N+N/SK	-	26-Aug-2024	-
Ion Balance									
Anion sum	----	60.7	-	0.10	meq/L	EC101/SK	-	26-Aug-2024	-
Cation sum	----	58.0	-	0.10	meq/L	EC101/SK	-	26-Aug-2024	-
Ion balance (APHA)	----	-2.27	-	0.01	%	EC101/SK	-	26-Aug-2024	-
Ion balance (cations/anions)	----	95.6	-	0.010	%	EC101/SK	-	26-Aug-2024	-
Dissolved Metals									
Calcium, dissolved	7440-70-2	317	± 22.6	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Iron, dissolved	7439-89-6	<0.050 DLDS	-	0.050	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Magnesium, dissolved	7439-95-4	267	± 21.6	0.0250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Manganese, dissolved	7439-96-5	1.45	± 0.107	0.00050	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Potassium, dissolved	7440-09-7	7.50	± 0.575	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Sodium, dissolved	7440-23-5	460	± 38.7	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Dissolved metals filtration location	----	Laboratory SFP	-	-	-	EP421/SK	-	28-Aug-2024	1618729

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

QUALITY CONTROL REPORT

Work Order	: **SK2404542**	Page	: 1 of 6
Client	: PINTER & Associates Ltd.	Laboratory	: ALS Environmental - Saskatoon
Contact	: Cassidy Salik	Account Manager	: Kimberley Head
Address	: 710A 48 Street East Saskatoon SK Canada S7K 5B4	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 306 244 1710	Telephone	: +1 306 668 8370
Project	: 3285-1	Date Samples Received	: 23-Aug-2024 15:24
PO	: 3285-1	Date Analysis Commenced	: 23-Aug-2024
C-O-C number	: ----	Issue Date	: 29-Aug-2024 20:19
Sampler	: TC		
Site	: Town of Raddison - WTP Upgrade		
Quote number	: 2024 rates		
No. of samples received	: 3		
No. of samples analysed	: 3		

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.

Signatories	*Position*	*Laboratory Department*
Colby Bingham	Laboratory Supervisor	Saskatoon Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Laboratory Supervisor	Saskatoon Metals, Saskatoon, Saskatchewan
Milad Khani	Laboratory Analyst	Saskatoon Inorganics, Saskatoon, Saskatchewan
Milad Khani	Laboratory Analyst	Saskatoon Metals, Saskatoon, Saskatchewan
Ruth Islas	Laboratory Assistant	Saskatoon Metals, Saskatoon, Saskatchewan

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: 1614557)											
RG2401306-001	Anonymous	pH	----	E108	0.10	pH units	7.79	7.86	0.894%	3%	----
Physical Tests (QC Lot: 1614558)											
RG2401306-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	2120	2030	4.34%	10%	----
Physical Tests (QC Lot: 1614559)											
RG2401306-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	685	730	6.39%	20%	----
Anions and Nutrients (QC Lot: 1614653)											
SK2404544-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.116	0.114	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1614654)											
SK2404544-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1614655)											
SK2404544-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1614656)											
SK2404544-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1618729)											
RG2401306-001	Anonymous	Calcium, dissolved	7440-70-2	E421	0.100	mg/L	142	137	3.46%	20%	----
		Iron, dissolved	7439-89-6	E421	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	138	136	1.12%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00020	mg/L	0.00054	0.00046	0.00008	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.100	mg/L	4.63	4.74	2.31%	20%	----
		Sodium, dissolved	7440-23-5	E421	0.100	mg/L	190	188	1.16%	20%	----

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: 1614558)						
Conductivity	----	E100	1	µS/cm	1.2	----
Physical Tests (QCLot: 1614559)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 1614653)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1614654)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1614655)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1614656)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Dissolved Metals (QCLot: 1618729)						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----

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	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1614557)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 1614558)									
Conductivity	----	E100	1	µS/cm	1000 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 1614559)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	108	85.0	115	----
Anions and Nutrients (QCLot: 1614653)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1614654)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1614655)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1614656)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	97.5	90.0	110	----
Dissolved Metals (QCLot: 1618729)									
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	98.4	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	106	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	104	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	99.3	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.

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
Anions and Nutrients (QCLot: 1614653)										
SK2404544-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.56 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1614654)										
SK2404544-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1614655)										
SK2404544-001	Anonymous	Chloride	16887-00-6	E235.Cl	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1614656)										
SK2404544-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.434 mg/L	0.5 mg/L	86.9	75.0	125	----
Dissolved Metals (QCLot: 1618729)										
RG2401306-002	Anonymous	Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Iron, dissolved	7439-89-6	E421	2.16 mg/L	2 mg/L	108	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0193 mg/L	0.02 mg/L	96.6	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	ND mg/L	----	ND	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----

ALS Canada Ltd.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **SK2404542**	Page	: 1 of 8
Client	: **PINTER & Associates Ltd.**	Laboratory	: ALS Environmental - Saskatoon
Contact	: Cassidy Salik	Account Manager	: Kimberley Head
Address	: 710A 48 Street East Saskatoon SK Canada S7K 5B4	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 306 244 1710	Telephone	: +1 306 668 8370
Project	: 3285-1	Date Samples Received	: 23-Aug-2024 15:24
PO	: 3285-1	Issue Date	: 29-Aug-2024 17:25
C-O-C number	: ----		
Sampler	: TC		
Site	: Town of Raddison - WTP Upgrade		
Quote number	: 2024 rates		
No. of samples received	: 3		
No. of samples analysed	: 3		

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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

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 : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE FM1	E235.Cl	23-Aug-2024	24-Aug-2024	28 days	1 days	✓	24-Aug-2024	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE LAG1	E235.Cl	23-Aug-2024	24-Aug-2024	28 days	1 days	✓	24-Aug-2024	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE TP2	E235.Cl	23-Aug-2024	24-Aug-2024	28 days	1 days	✓	24-Aug-2024	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE FM1	E235.NO3	23-Aug-2024	24-Aug-2024	3 days	1 days	✓	24-Aug-2024	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE LAG1	E235.NO3	23-Aug-2024	24-Aug-2024	3 days	1 days	✓	24-Aug-2024	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE TP2	E235.NO3	23-Aug-2024	24-Aug-2024	3 days	1 days	✓	24-Aug-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE FM1	E235.NO2	23-Aug-2024	24-Aug-2024	3 days	1 days	✓	24-Aug-2024	3 days	1 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / 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										
LAG1	E235.NO2	23-Aug-2024	24-Aug-2024	3 days	1 days	✓	24-Aug-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
TP2	E235.NO2	23-Aug-2024	24-Aug-2024	3 days	1 days	✓	24-Aug-2024	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
FM1	E235.SO4	23-Aug-2024	24-Aug-2024	28 days	1 days	✓	24-Aug-2024	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
LAG1	E235.SO4	23-Aug-2024	24-Aug-2024	28 days	1 days	✓	24-Aug-2024	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
TP2	E235.SO4	23-Aug-2024	24-Aug-2024	28 days	1 days	✓	24-Aug-2024	28 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE										
FM1	E421	23-Aug-2024	28-Aug-2024	0 hrs	122 hrs	× UCP	28-Aug-2024	0 hrs	122 hrs	× UCP
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE										
LAG1	E421	23-Aug-2024	28-Aug-2024	0 hrs	122 hrs	× UCP	28-Aug-2024	0 hrs	122 hrs	× UCP
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE										
TP2	E421	23-Aug-2024	28-Aug-2024	0 hrs	122 hrs	× UCP	28-Aug-2024	0 hrs	122 hrs	× UCP
Physical Tests : Alkalinity Species by Titration										
HDPE										
FM1	E290	23-Aug-2024	24-Aug-2024	14 days	1 days	✓	24-Aug-2024	14 days	1 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE LAG1	E290	23-Aug-2024	24-Aug-2024	14 days	1 days	✓	24-Aug-2024	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE TP2	E290	23-Aug-2024	24-Aug-2024	14 days	1 days	✓	24-Aug-2024	14 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE FM1	E100	23-Aug-2024	24-Aug-2024	28 days	1 days	✓	24-Aug-2024	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE LAG1	E100	23-Aug-2024	24-Aug-2024	28 days	1 days	✓	24-Aug-2024	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE TP2	E100	23-Aug-2024	24-Aug-2024	28 days	1 days	✓	24-Aug-2024	28 days	1 days	✓
Physical Tests : pH by Meter										
HDPE FM1	E108	23-Aug-2024	24-Aug-2024	0.25 hrs	22 hrs	× EHTR-FM	24-Aug-2024	0.25 hrs	22 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE LAG1	E108	23-Aug-2024	24-Aug-2024	0.25 hrs	22 hrs	× EHTR-FM	24-Aug-2024	0.25 hrs	22 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE TP2	E108	23-Aug-2024	24-Aug-2024	0.25 hrs	22 hrs	× EHTR-FM	24-Aug-2024	0.25 hrs	22 hrs	× EHTR-FM

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

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

UCP: Unsuitable Container and/or Preservative used (invalidates standard hold time). Maximum hold time of zero applied. Test results may be biased low / unreliable, and may not meet regulatory requirements.

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	1614559	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	1614655	1	5	20.0	5.0	✓
Conductivity in Water	E100	1614558	1	16	6.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1618729	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1614653	1	5	20.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1614656	1	5	20.0	5.0	✓
pH by Meter	E108	1614557	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1614654	1	5	20.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1614559	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	1614655	1	5	20.0	5.0	✓
Conductivity in Water	E100	1614558	1	16	6.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1618729	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1614653	1	5	20.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1614656	1	5	20.0	5.0	✓
pH by Meter	E108	1614557	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1614654	1	5	20.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1614559	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	1614655	1	5	20.0	5.0	✓
Conductivity in Water	E100	1614558	1	16	6.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1618729	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1614653	1	5	20.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1614656	1	5	20.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1614654	1	5	20.0	5.0	✓
Matrix Spikes (MS)							
Chloride in Water by IC	E235.Cl	1614655	1	5	20.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1618729	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1614653	1	5	20.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1614656	1	5	20.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1614654	1	5	20.0	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
Conductivity in Water	E100 ALS Environmental - Saskatoon	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 ALS Environmental - Saskatoon	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Chloride in Water by IC	E235.Cl ALS Environmental - Saskatoon	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 ALS Environmental - Saskatoon	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 ALS Environmental - Saskatoon	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 ALS Environmental - Saskatoon	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Saskatoon	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.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Saskatoon	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 ALS Environmental - Saskatoon	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Saskatoon	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 ALS Environmental - Saskatoon	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Saskatoon	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals Water Filtration	EP421 ALS Environmental - Saskatoon	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Report To		Report Format / Distribution	Service Requested (Rt
Company:	PINTER & Associates Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnar
Contact:	Cassidy Salik	☑ PDF ☑ Excel ☑ Digital ☐ Fax	○ Priority (2-4 Business Day
Address:	710A 48th Street East	Email 1: thomas.collins@pinter.ca	○ Emergency (1-2 Bus. Days
	Saskatoon, SK S7K 5B4	Email 2: jessica.cutter@pinter.ca	○ Same Day or Weekend En
Phone:	306.244.1710 Fax: 306.933.4986	Email 3: reece.heffernan@pinter.ca	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Please indicate below
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #: 3285-1	
Company:	SAME	PO / AFE: 3285-1	
Contact:		LSD: Town of Raddison - WTP Upgrade	
Address:			
Phone:	Fax:	Quote #:	

Lab Work Order # (lab use only): _____

ALS Contact: Kimberly Head Sampler: TC

Environmental Division Saskatoon
Work Order Reference
SK2404542

Telephone : +1 306 668 8370

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Routine PR01(no fluoride)	Number of Containers
	~~TP1~~	~~23-Aug-24~~		~~Surface Water~~	~~X~~	2
	TP2	23-Aug-24		Surface Water	X	2
	LAG1	23-Aug-24		Surface Water	X	2
	FM1	23-Aug-24		Surface Water	X	2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Jordan Jurke	23-Aug-24		ME3	23 Aug 24	3:24	6.3 °C	ME3	23 Aug 24	3:24	

CERTIFICATE OF ANALYSIS

Work Order	: **SK2404570**	Page	: 1 of 6
Client	: **PINTER & Associates Ltd.**	Laboratory	: ALS Environmental - Saskatoon
Contact	: Jessica Cutter	Account Manager	: Kimberley Head
Address	: 710A 48 Street East Saskatoon SK Canada S7K 5B4	Address	: 819 58 Street East Saskatoon SK Canada S7K 6X5
Telephone	: 306 244 1710	Telephone	: +1 306 668 8370
Project	: 3285-1	Date Samples Received	: 26-Aug-2024 16:40
PO	: 3285-1	Date Analysis Commenced	: 27-Aug-2024
C-O-C number	: ----	Issue Date	: 29-Aug-2024 21:50
Sampler	: TC		
Site	: Town of Raddison-WTP Upgrade		
Quote number	: 2024 rates		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Colby Bingham	Laboratory Supervisor	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Laboratory Supervisor	Metals, Saskatoon, Saskatchewan
Milad Khani	Laboratory Analyst	Inorganics, Saskatoon, Saskatchewan
Milad Khani	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Ruth Islas	Laboratory Assistant	Metals, Saskatoon, Saskatchewan

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).
Measurement Uncertainty: The reported uncertainties in this report are expanded uncertainties calculated using a coverage factor of 2, which gives a level of confidence of approximately 95%.
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.

Unit	*Description*
-	no units
%	percent
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.

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.

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	SK ALS Environmental - Saskatoon	819 58 Street East, Saskatoon, SK

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
SFP	*Sample was filtered and preserved at the laboratory.*

Analytical Results

SK2404570-001

Sub-Matrix: **Surface Water** (Matrix: **Water**)

Client sample ID: TP1

Client sampling date / time: 23-Aug-2024 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot
Physical Tests									
Hardness (as CaCO3), dissolved	----	2450	-	0.50	mg/L	EC100/SK	-	29-Aug-2024	-
Conductivity	----	5660	± 114	2.0	µS/cm	E100/SK A	27-Aug-2024	27-Aug-2024	1618643
pH	----	7.84	± 0.04	0.10	pH units	E108/SK A	27-Aug-2024	27-Aug-2024	1618642
Alkalinity, bicarbonate (as HCO3)	71-52-3	1050	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, carbonate (as CO3)	3812-32-6	<1.0	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, total (as CaCO3)	----	860	± 27.8	2.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Solids, total dissolved [TDS], calculated	----	4190	-	1.0	mg/L	EC103/SK	-	28-Aug-2024	-
Anions and Nutrients									
Chloride	16887-00-6	936	± 55.8	25.0	mg/L	E235.Cl/SK A	27-Aug-2024	27-Aug-2024	1618149
Nitrate (as N)	14797-55-8	<1.00 DLDS	-	1.00	mg/L	E235.NO3/SK A	27-Aug-2024	27-Aug-2024	1618147
Nitrite (as N)	14797-65-0	<0.500 DLDS	-	0.500	mg/L	E235.NO2/SK A	27-Aug-2024	27-Aug-2024	1618150
Sulfate (as SO4)	14808-79-8	1490	± 80.1	15.0	mg/L	E235.SO4/SK A	27-Aug-2024	27-Aug-2024	1618148
Nitrate + Nitrite (as N)	----	<1.12	-	1.12	mg/L	EC235.N+N/SK	-	28-Aug-2024	-
Ion Balance									
Anion sum	----	74.6	-	0.10	meq/L	EC101/SK	-	28-Aug-2024	-
Cation sum	----	71.0	-	0.10	meq/L	EC101/SK	-	28-Aug-2024	-
Ion balance (APHA)	----	-2.47	-	0.01	%	EC101/SK	-	28-Aug-2024	-
Ion balance (cations/anions)	----	95.2	-	0.010	%	EC101/SK	-	28-Aug-2024	-
Dissolved Metals									
Calcium, dissolved	7440-70-2	314	± 22.3	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Iron, dissolved	7439-89-6	<0.050 DLDS	-	0.050	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Magnesium, dissolved	7439-95-4	404	± 32.6	0.0250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Manganese, dissolved	7439-96-5	0.00126	± 0.00010	0.00050	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Potassium, dissolved	7440-09-7	9.14	± 0.700	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Sodium, dissolved	7440-23-5	503	± 42.3	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Dissolved metals filtration location	----	Laboratory SFP	-	-	-	EP421/SK	-	28-Aug-2024	1618729

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

SK2404570-002

Sub-Matrix: **Surface Water** (Matrix: **Water**)

Client sample ID: TP4

Client sampling date / time: 23-Aug-2024 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot
Physical Tests									
Hardness (as CaCO3), dissolved	----	4640	-	0.50	mg/L	EC100/SK	-	29-Aug-2024	-
Conductivity	----	8930	± 180	2.0	µS/cm	E100/SK A	27-Aug-2024	27-Aug-2024	1618643
pH	----	7.91	± 0.04	0.10	pH units	E108/SK A	27-Aug-2024	27-Aug-2024	1618642
Alkalinity, bicarbonate (as HCO3)	71-52-3	856	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, carbonate (as CO3)	3812-32-6	<1.0	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, total (as CaCO3)	----	701	± 22.8	2.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Solids, total dissolved [TDS], calculated	----	7940	-	1.0	mg/L	EC103/SK	-	28-Aug-2024	-
Anions and Nutrients									
Chloride	16887-00-6	1130	± 67.3	25.0	mg/L	E235.Cl/SK A	27-Aug-2024	27-Aug-2024	1618149
Nitrate (as N)	14797-55-8	<1.00 DLDS	-	1.00	mg/L	E235.NO3/SK A	27-Aug-2024	27-Aug-2024	1618147
Nitrite (as N)	14797-65-0	<0.500 DLDS	-	0.500	mg/L	E235.NO2/SK A	27-Aug-2024	27-Aug-2024	1618150
Sulfate (as SO4)	14808-79-8	4190	± 225	15.0	mg/L	E235.SO4/SK A	27-Aug-2024	27-Aug-2024	1618148
Nitrate + Nitrite (as N)	----	<1.12	-	1.12	mg/L	EC235.N+N/SK	-	28-Aug-2024	-
Ion Balance									
Anion sum	----	133	-	0.10	meq/L	EC101/SK	-	28-Aug-2024	-
Cation sum	----	129	-	0.10	meq/L	EC101/SK	-	28-Aug-2024	-
Ion balance (APHA)	----	-1.53	-	0.01	%	EC101/SK	-	28-Aug-2024	-
Ion balance (cations/anions)	----	97.0	-	0.010	%	EC101/SK	-	28-Aug-2024	-
Dissolved Metals									
Calcium, dissolved	7440-70-2	508	± 36.1	0.500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Iron, dissolved	7439-89-6	<0.100 DLDS	-	0.100	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Magnesium, dissolved	7439-95-4	820	± 66.3	0.0500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Manganese, dissolved	7439-96-5	0.0325	± 0.00239	0.00100	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Potassium, dissolved	7440-09-7	12.1	± 0.926	0.500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Sodium, dissolved	7440-23-5	822	± 69.1	0.500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Dissolved metals filtration location	----	Laboratory SFP	-	-	-	EP421/SK	-	28-Aug-2024	1618729

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

SK2404570-003

Sub-Matrix: **Surface Water** (Matrix: **Water**)

Client sample ID: TP6

Client sampling date / time: 23-Aug-2024 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot
Physical Tests									
Hardness (as CaCO3), dissolved	----	4190	-	0.50	mg/L	EC100/SK	-	29-Aug-2024	-
Conductivity	----	9180	± 185	2.0	µS/cm	E100/SK A	27-Aug-2024	27-Aug-2024	1618643
pH	----	8.09	± 0.04	0.10	pH units	E108/SK A	27-Aug-2024	27-Aug-2024	1618642
Alkalinity, bicarbonate (as HCO3)	71-52-3	652	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, carbonate (as CO3)	3812-32-6	<1.0	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, total (as CaCO3)	----	534	± 17.4	2.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Solids, total dissolved [TDS], calculated	----	8540	-	1.0	mg/L	EC103/SK	-	28-Aug-2024	-
Anions and Nutrients									
Chloride	16887-00-6	535	± 31.9	25.0	mg/L	E235.Cl/SK A	27-Aug-2024	27-Aug-2024	1618149
Nitrate (as N)	14797-55-8	<1.00 DLDS	-	1.00	mg/L	E235.NO3/SK A	27-Aug-2024	27-Aug-2024	1618147
Nitrite (as N)	14797-65-0	<0.500 DLDS	-	0.500	mg/L	E235.NO2/SK A	27-Aug-2024	27-Aug-2024	1618150
Sulfate (as SO4)	14808-79-8	5320	± 285	15.0	mg/L	E235.SO4/SK A	27-Aug-2024	27-Aug-2024	1618148
Nitrate + Nitrite (as N)	----	<1.12	-	1.12	mg/L	EC235.N+N/SK	-	28-Aug-2024	-
Ion Balance									
Anion sum	----	136	-	0.10	meq/L	EC101/SK	-	28-Aug-2024	-
Cation sum	----	134	-	0.10	meq/L	EC101/SK	-	28-Aug-2024	-
Ion balance (APHA)	----	-0.74	-	0.01	%	EC101/SK	-	28-Aug-2024	-
Ion balance (cations/anions)	----	98.5	-	0.010	%	EC101/SK	-	28-Aug-2024	-
Dissolved Metals									
Calcium, dissolved	7440-70-2	410	± 29.2	0.500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Iron, dissolved	7439-89-6	<0.100 DLDS	-	0.100	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Magnesium, dissolved	7439-95-4	768	± 62.1	0.0500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Manganese, dissolved	7439-96-5	0.00875	± 0.00064	0.00100	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Potassium, dissolved	7440-09-7	14.3	± 1.09	0.500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Sodium, dissolved	7440-23-5	1140	± 95.8	0.500	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Dissolved metals filtration location	----	Laboratory SFP	-	-	-	EP421/SK	-	28-Aug-2024	1618729

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

SK2404570-004

Sub-Matrix: **Surface Water** (Matrix: **Water**)

Client sample ID: TP8

Client sampling date / time: 23-Aug-2024 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot
Physical Tests									
Hardness (as CaCO3), dissolved	----	2640	-	0.50	mg/L	EC100/SK	-	29-Aug-2024	-
Conductivity	----	5240	± 106	2.0	µS/cm	E100/SK A	27-Aug-2024	27-Aug-2024	1618643
pH	----	7.77	± 0.04	0.10	pH units	E108/SK A	27-Aug-2024	27-Aug-2024	1618642
Alkalinity, bicarbonate (as HCO3)	71-52-3	346	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, carbonate (as CO3)	3812-32-6	<1.0	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	-	1.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Alkalinity, total (as CaCO3)	----	283	± 9.4	2.0	mg/L	E290/SK A	27-Aug-2024	27-Aug-2024	1618644
Solids, total dissolved [TDS], calculated	----	3960	-	1.0	mg/L	EC103/SK	-	28-Aug-2024	-
Anions and Nutrients									
Chloride	16887-00-6	941	± 56.1	10.0	mg/L	E235.Cl/SK A	27-Aug-2024	27-Aug-2024	1618149
Nitrate (as N)	14797-55-8	0.876	± 0.051	0.400	mg/L	E235.NO3/SK A	27-Aug-2024	27-Aug-2024	1618147
Nitrite (as N)	14797-65-0	<0.200 DLDS	-	0.200	mg/L	E235.NO2/SK A	27-Aug-2024	27-Aug-2024	1618150
Sulfate (as SO4)	14808-79-8	1680	± 90.1	6.00	mg/L	E235.SO4/SK A	27-Aug-2024	27-Aug-2024	1618148
Nitrate + Nitrite (as N)	----	0.876	-	0.447	mg/L	EC235.N+N/SK	-	28-Aug-2024	-
Ion Balance									
Anion sum	----	67.2	-	0.10	meq/L	EC101/SK	-	28-Aug-2024	-
Cation sum	----	64.1	-	0.10	meq/L	EC101/SK	-	28-Aug-2024	-
Ion balance (APHA)	----	-2.36	-	0.01	%	EC101/SK	-	28-Aug-2024	-
Ion balance (cations/anions)	----	95.4	-	0.010	%	EC101/SK	-	28-Aug-2024	-
Dissolved Metals									
Calcium, dissolved	7440-70-2	561	± 39.9	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Iron, dissolved	7439-89-6	<0.050 DLDS	-	0.050	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Magnesium, dissolved	7439-95-4	300	± 24.3	0.0250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Manganese, dissolved	7439-96-5	0.00964	± 0.00071	0.00050	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Potassium, dissolved	7440-09-7	41.7	± 3.19	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Sodium, dissolved	7440-23-5	238	± 20.0	0.250	mg/L	E421/SK A	28-Aug-2024	28-Aug-2024	1618729
Dissolved metals filtration location	----	Laboratory SFP	-	-	-	EP421/SK	-	28-Aug-2024	1618729

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

QUALITY CONTROL REPORT

Work Order	: **SK2404570**	Page	: 1 of 6
Client	: PINTER & Associates Ltd.	Laboratory	: ALS Environmental - Saskatoon
Contact	: Jessica Cutter	Account Manager	: Kimberley Head
Address	: 710A 48 Street East Saskatoon SK Canada S7K 5B4	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 306 244 1710	Telephone	: +1 306 668 8370
Project	: 3285-1	Date Samples Received	: 26-Aug-2024 16:40
PO	: 3285-1	Date Analysis Commenced	: 27-Aug-2024
C-O-C number	: ----	Issue Date	: 30-Aug-2024 07:42
Sampler	: TC		
Site	: Town of Raddison-WTP Upgrade		
Quote number	: 2024 rates		
No. of samples received	: 4		
No. of samples analysed	: 4		

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.

Signatories	*Position*	*Laboratory Department*
Colby Bingham	Laboratory Supervisor	Saskatoon Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Laboratory Supervisor	Saskatoon Metals, Saskatoon, Saskatchewan
Milad Khani	Laboratory Analyst	Saskatoon Inorganics, Saskatoon, Saskatchewan
Milad Khani	Laboratory Analyst	Saskatoon Metals, Saskatoon, Saskatchewan
Ruth Islas	Laboratory Assistant	Saskatoon Metals, Saskatoon, Saskatchewan

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: 1618642)											
RG2401311-001	Anonymous	pH	----	E108	0.10	pH units	8.44	8.45	0.118%	3%	----
Physical Tests (QC Lot: 1618643)											
RG2401311-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	2630	2550	3.09%	10%	----
Physical Tests (QC Lot: 1618644)											
RG2401311-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	282	282	0.0638%	20%	----
Anions and Nutrients (QC Lot: 1618147)											
RG2401311-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.400	mg/L	<0.400	<0.400	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1618148)											
RG2401311-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	6.00	mg/L	1220	1220	0.532%	20%	----
Anions and Nutrients (QC Lot: 1618149)											
RG2401311-001	Anonymous	Chloride	16887-00-6	E235.Cl	10.0	mg/L	77.6	77.6	0.04	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1618150)											
RG2401311-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.200	mg/L	<0.200	<0.200	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1618729)											
RG2401306-001	Anonymous	Calcium, dissolved	7440-70-2	E421	0.100	mg/L	142	137	3.46%	20%	----
		Iron, dissolved	7439-89-6	E421	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	138	136	1.12%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00020	mg/L	0.00054	0.00046	0.00008	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.100	mg/L	4.63	4.74	2.31%	20%	----
		Sodium, dissolved	7440-23-5	E421	0.100	mg/L	190	188	1.16%	20%	----

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: 1618643)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1618644)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 1618147)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1618148)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1618149)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1618150)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Dissolved Metals (QCLot: 1618729)						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----

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	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1618642)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 1618643)									
Conductivity	----	E100	1	µS/cm	1000 µS/cm	98.4	90.0	110	----
Physical Tests (QCLot: 1618644)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	110	85.0	115	----
Anions and Nutrients (QCLot: 1618147)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	99.9	90.0	110	----
Anions and Nutrients (QCLot: 1618148)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	98.4	90.0	110	----
Anions and Nutrients (QCLot: 1618149)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.8	90.0	110	----
Anions and Nutrients (QCLot: 1618150)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	98.2	90.0	110	----
Dissolved Metals (QCLot: 1618729)									
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	98.4	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	106	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	104	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	99.3	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.

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
Anions and Nutrients (QCLot: 1618147)										
RG2401311-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.49 mg/L	2.5 mg/L	99.5	75.0	125	----
Anions and Nutrients (QCLot: 1618148)										
RG2401311-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	----	ND	75.0	125	----
Anions and Nutrients (QCLot: 1618149)										
RG2401311-001	Anonymous	Chloride	16887-00-6	E235.Cl	99.1 mg/L	100 mg/L	99.1	75.0	125	----
Anions and Nutrients (QCLot: 1618150)										
RG2401311-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.484 mg/L	0.5 mg/L	96.7	75.0	125	----
Dissolved Metals (QCLot: 1618729)										
RG2401306-002	Anonymous	Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Iron, dissolved	7439-89-6	E421	2.16 mg/L	2 mg/L	108	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0193 mg/L	0.02 mg/L	96.6	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	ND mg/L	----	ND	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **SK2404570**	Page	: 1 of 9
Client	: **PINTER & Associates Ltd.**	Laboratory	: ALS Environmental - Saskatoon
Contact	: Jessica Cutter	Account Manager	: Kimberley Head
Address	: 710A 48 Street East Saskatoon SK Canada S7K 5B4	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 306 244 1710	Telephone	: +1 306 668 8370
Project	: 3285-1	Date Samples Received	: 26-Aug-2024 16:40
PO	: 3285-1	Issue Date	: 29-Aug-2024 20:56
C-O-C number	: ----		
Sampler	: TC		
Site	: Town of Raddison-WTP Upgrade		
Quote number	: 2024 rates		
No. of samples received	: 4		
No. of samples analysed	: 4		

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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

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 : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE TP1	E235.Cl	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE TP4	E235.Cl	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE TP6	E235.Cl	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE TP8	E235.Cl	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE TP1	E235.NO3	23-Aug-2024	27-Aug-2024	3 days	3 days	✓	27-Aug-2024	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE TP4	E235.NO3	23-Aug-2024	27-Aug-2024	3 days	3 days	✓	27-Aug-2024	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE TP6	E235.NO3	23-Aug-2024	27-Aug-2024	3 days	3 days	✓	27-Aug-2024	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Anions and Nutrients : Nitrate in Water by IC										
HDPE TP8	E235.NO3	23-Aug-2024	27-Aug-2024	3 days	3 days	✓	27-Aug-2024	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE TP1	E235.NO2	23-Aug-2024	27-Aug-2024	3 days	3 days	✓	27-Aug-2024	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE TP4	E235.NO2	23-Aug-2024	27-Aug-2024	3 days	3 days	✓	27-Aug-2024	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE TP6	E235.NO2	23-Aug-2024	27-Aug-2024	3 days	3 days	✓	27-Aug-2024	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE TP8	E235.NO2	23-Aug-2024	27-Aug-2024	3 days	3 days	✓	27-Aug-2024	3 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE TP1	E235.SO4	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE TP4	E235.SO4	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE TP6	E235.SO4	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE TP8	E235.SO4	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / 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*	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE TP1	E421	23-Aug-2024	28-Aug-2024	0 hrs	122 hrs	✗ UCP	28-Aug-2024	0 hrs	122 hrs	✗ UCP
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE TP4	E421	23-Aug-2024	28-Aug-2024	0 hrs	122 hrs	✗ UCP	28-Aug-2024	0 hrs	122 hrs	✗ UCP
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE TP6	E421	23-Aug-2024	28-Aug-2024	0 hrs	122 hrs	✗ UCP	28-Aug-2024	0 hrs	122 hrs	✗ UCP
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE TP8	E421	23-Aug-2024	28-Aug-2024	0 hrs	122 hrs	✗ UCP	28-Aug-2024	0 hrs	122 hrs	✗ UCP
Physical Tests : Alkalinity Species by Titration										
HDPE TP1	E290	23-Aug-2024	27-Aug-2024	14 days	4 days	✓	27-Aug-2024	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE TP4	E290	23-Aug-2024	27-Aug-2024	14 days	4 days	✓	27-Aug-2024	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE TP6	E290	23-Aug-2024	27-Aug-2024	14 days	4 days	✓	27-Aug-2024	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE TP8	E290	23-Aug-2024	27-Aug-2024	14 days	4 days	✓	27-Aug-2024	14 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE TP1	E100	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE TP4	E100	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE TP6	E100	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE TP8	E100	23-Aug-2024	27-Aug-2024	28 days	4 days	✓	27-Aug-2024	28 days	4 days	✓
Physical Tests : pH by Meter										
HDPE TP1	E108	23-Aug-2024	27-Aug-2024	0.25 hrs	96 hrs	× EHTR-FM	27-Aug-2024	0.25 hrs	96 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE TP4	E108	23-Aug-2024	27-Aug-2024	0.25 hrs	96 hrs	× EHTR-FM	27-Aug-2024	0.25 hrs	96 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE TP6	E108	23-Aug-2024	27-Aug-2024	0.25 hrs	96 hrs	× EHTR-FM	27-Aug-2024	0.25 hrs	96 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE TP8	E108	23-Aug-2024	27-Aug-2024	0.25 hrs	96 hrs	× EHTR-FM	27-Aug-2024	0.25 hrs	96 hrs	× EHTR-FM

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

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

UCP: Unsuitable Container and/or Preservative used (invalidates standard hold time). Maximum hold time of zero applied. Test results may be biased low / unreliable, and may not meet regulatory requirements.

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	1618644	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	1618149	1	9	11.1	5.0	✓
Conductivity in Water	E100	1618643	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1618729	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1618147	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1618150	1	9	11.1	5.0	✓
pH by Meter	E108	1618642	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1618148	1	9	11.1	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1618644	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	1618149	1	9	11.1	5.0	✓
Conductivity in Water	E100	1618643	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1618729	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1618147	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1618150	1	9	11.1	5.0	✓
pH by Meter	E108	1618642	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1618148	1	9	11.1	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1618644	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	1618149	1	9	11.1	5.0	✓
Conductivity in Water	E100	1618643	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1618729	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1618147	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1618150	1	9	11.1	5.0	✓
Sulfate in Water by IC	E235.SO4	1618148	1	9	11.1	5.0	✓
Matrix Spikes (MS)							
Chloride in Water by IC	E235.Cl	1618149	1	9	11.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1618729	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1618147	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1618150	1	9	11.1	5.0	✓
Sulfate in Water by IC	E235.SO4	1618148	1	9	11.1	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
Conductivity in Water	E100 ALS Environmental - Saskatoon	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 ALS Environmental - Saskatoon	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Chloride in Water by IC	E235.Cl ALS Environmental - Saskatoon	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 ALS Environmental - Saskatoon	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 ALS Environmental - Saskatoon	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 ALS Environmental - Saskatoon	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Saskatoon	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.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Saskatoon	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 ALS Environmental - Saskatoon	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Saskatoon	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 ALS Environmental - Saskatoon	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Saskatoon	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals Water Filtration	EP421 ALS Environmental - Saskatoon	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Page 1 of 1

Report To				Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	PINTER & Associates Ltd.			☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Jessica Cutter			☑ PDF	☑ Excel	☑ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	710A 48th Street East			Email 1:	thomas.collins@pinter.ca			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saskatoon, SK S7K 5B4			Email 2:	jessica.cutter@pinter.ca			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	306.244.1710	Fax:	306.933.4986	Email 3:	reece.heffernan@pinter.ca			Analysis Request
Invoice To	Same as Report ?	☑ Yes	☐ No	Client / Project Information				Please indicate below Fi
Hardcopy of Invoice with Report?		☐ Yes	☑ No	Job #:	3285-1			
Company:	SAME			PO / AFE:	3285-1			
Contact:				LSD:	Town of Raddison - WTP Upgrade			
Address:								
Phone:		Fax:		Quote #:				

Lab Work Order # (lab use only): _____

ALS Contact: Kimberly Head

Sampler: TC

Environmental Division Saskatoon

Work Order Reference

SK2404570

Telephone : +1 306 668 8370

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Routine PR01(no fluoride)	Number of Containers
	TP1	23-Aug-24		Surface Water	X	2
	TP4	26-Aug-24		Surface Water	X	2
	TP6	26-Aug-24		Surface Water	X	2
	TP8	26-Aug-24		Surface Water	X	2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Thomas Collins	26-Aug-24					9.2 °C	JC	Aug 26	440	