WASTEWATER TREATMENT PLANT
2024 ANNUAL REPORT

DISTRICT OF LAKE COUNTRY

LAKE COUNTRY
Life. The Okanagan Way.

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This annual report for the year 2024 is submitted according to the requirements of the Lake Country Wastewater Treatment Plant (LCWWTP) Operational Certificate – #14651. This report follows the format of the Operational Certificate. The Operational Certificate was first issued in November 1998 and last amended in October 2024. This report will be made available to the public, but its intended audience is the governing agency with the Province of BC.

The LCWWTP, located at 4062 Beaver Lake Road in Lake Country, British Columbia, is a Class IV tertiary treatment plant owned, operated, and maintained by the District of Lake Country.

This document has been reviewed by the Wastewater Crew Leader and shared with wastewater operators and relevant District of Lake Country personnel. I certify that the information in this document and all attachments are correct, accurate, and complete to the best of my knowledge.

Cover image taken on November 2014 after phase III upgrade.

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1.0 Authorized Discharges

1.1 Authorized Source

The Lake Country Wastewater Treatment Plant (LCWWTP) authorized works consist of a biological nutrient removal tertiary treatment plant, effluent filtration, flow monitoring, and a surface to ground disposal system.

The effluent discharge is monitored under the Environmental Monitoring System (EMS) with the reference number E233626. Treated effluent from the LCWWTP is discharged into a ground infiltration system situated south of the treatment plant. The infiltration system consists of 3 open basins and one subsurface disposal field.

The discharge is authorized in accordance with the provisions outlined in Operational Certificate (OC) – #14651, initially issued on November 5, 1998, and last amended on October 8, 2024.

Figure 1: Effluent RI Basin 1

1.1.1 Authorized Rate of Discharge

The authorized rate of discharge is a monthly average of 2000 m^3/d, based on daily values averaged on a monthly basis. Effluent totals are calculated by subtracting the recirculated water meter total and the effluent discharged into the Kelowna collection system meter total from the plant's effluent flow meter total. The recirculated effluent, drawn from the effluent discharge line after the effluent flow meter, is used as process water throughout the plant. Due to capacity constraints within Lake Country's disposal systems, some flows are discharged into the Kelowna Collection System for further treatment and disposal at the Kelowna WWTP, as part of an ongoing agreement with City of Kelowna. The connection between Lake Country's WWTP and the City of Kelowna's Collection System was constructed between Fall 2023 and Spring 2024. For more details, see Section 2.4.

In 2024 the annual average discharge was 1,715 m^3/d (compared to 1,892 m^3/d in 2023). The highest monthly average was in February at 1,884 m^3/d, which is below the OC requirement. Detailed monthly flow data is provided in Table 1, with daily flows available in Appendix A.

Table 1: Daily, Monthly, and Average Influent and Effluent Flows

2024	Influent		Effluent Discharge				
	DLC Collection System	Regional Septage	Surface to Ground Disposal				Kelowna Collection System
	Flow (m^3/month)	Flow (m^3/month)	Flow (m^3/month)	Minimum (m^3/day)	Maximum (m^3/day)	Daily Avg (m^3/day)	Flow (m^3/month)
January	50,492	414	57,209	1,712	2,046	1,845	0
February	48,178	338	54,634	1,787	2,040	1,884	0
March	50,172	678	57,144	1,740	1,963	1,843	0
April	49,117	1,317	54,462	1,574	2,010	1,815	1,765
May	49,363	1,346	51,111	1,572	1,802	1,649	5,742
June	48,470	1,162	49,862	1,565	1,859	1,662	6,385
July	51,486	1,111	52,991	718	2,284	1,709	5,881
August	50,810	1,080	50,095	1,493	1,769	1,616	7,914
September	47,808	1,134	46,334	1,413	1,846	1,544	8,146
October	50,097	1,513	49,503	1,491	2,041	1,579	8,231
November	48,274	999	50,899	1,507	1,979	1,697	4,662
December	50,106	514	52,931	1,459	1,941	1,707	4,406
Annual	**594,373**	**11,606**	**627,175**	**718**	**2,284**	**1,715**	**53,132**

1.1.2 Characteristics of Discharge

Monthly grab samples are taken to an accredited lab for analysis. Listed in Table 2 are the accredited lab results from the monthly samples. Daily in-house samples are also taken for process control and operational performance checks using the standard methods listed in the BC Field Sampling Manual (2013 ed.) and the British Columbia Environmental Laboratory Manual (2023 ed.).

Figure 2: In-house Laboratory

Table 2: Effluent Monthly Grab Samples - Accredited Lab Analysis

	$CBOD_5$ (mg/L)	TSS (mg/L)	Ortho – P (mg/L)	Total Soluble N (mg/L)	pH
Daily OC Maximums	**10**	**20**	**1.5**	**10**	
January	4	<3	0.08	4.22	7.62
February	6	<2	0.06	4.17	7.41
March	2	<2	0.29	4.42	7.66
April	3	<2	0.06	3.76	7.63
May	<5	<2	0.07	4.17	7.67
June	6	2	0.08	5.15	7.73
July	<3	2	0.23	4.44	7.48
August	<5	<2	0.43	2.01	8.06
September	<4	<2	1.00	3.64	7.87
October	<3	<2	0.41	2.87	7.93
November	<4	<2	0.96	5.33	7.97
December	<3	<2	0.18	5.49	7.90
Annual Average	**2.9**[1]	**1.2**[1]	**0.32**[2]	**4.14**	**7.74**
Annual Average OC Maximums	-	-	**0.15**	**6**	-

[1]As per standard practice half the detection limit has been used to calculate the average concentration.

[2]Refer to section 4.3.1 of this report for explanation of this exceedance.

The 2024 effluent discharge sampling results for Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), Total Suspended Solids (TSS), Ortho-Phosphorus as P, and Soluble Nitrogen as N are discussed in the following subsections.

CARBONACEOUS BOD ($CBOD_5$)

The monthly $CBOD_5$ samples are analyzed by an accredited lab (refer to Table 2 for results). Detailed results from the accredited laboratory can be found in Appendix B.

$CBOD_5$ levels have significantly decreased since the installation of effluent filters in 2023, with an average concentration of 3.9 mg/L in 2024 compared to an annual average concentration of 6.7 mg/L in 2022. The maximum of 6 mg/L was observed in June, which is below the OC requirement.

TOTAL SUSPENDED SOLIDS (TSS)

Suspended Solids are analyzed monthly by an accredited lab (refer to Table 2 for results). The yearly average was 2 mg/L. There were no occasions in 2024 when TSS was higher than the operational certificate requirement of 20 mg/L, with the maximum concentration for 2024 being 2 mg/L. TSS is also analyzed in-house seven days a week to help inform process control. Effluent disc filters were added to the LCWWTP in 2023 and has improved the TSS results significantly.

ORTHO PHOSPHORUS

Effluent Ortho Phosphorus is analyzed monthly by an external accredited laboratory (refer to Table 2 for results). The Ortho Phosphorus annual average was 0.32 mg/L. This was above the operational certificate requirement of 0.15 mg/L for an annual average. Section 4.3.1 speaks to this exceedance. Operations is seeing an improvement in Ortho Phosphorus in the winter of 2025, supporting the idea

that it is related to septage, as hauls are lower during this time. A new aerator will be added to the TWAS storage tank in 2025, which may further help reduce Ortho Phosphorus levels.

At no time in 2024 did the effluent Ortho Phosphorus exceed the daily limit of 1.5 mg/L, with the maximum concentration of 1.00 mg/L occurring in September. Ortho Phosphorus is also analyzed inhouse daily to help inform process control.

SOLUBLE NITROGEN

Soluble Nitrogen is measured as the sum of ammonia, nitrite, and nitrate, as per the operational certificate. Samples are analyzed monthly by an accredited lab (refer to Table 2 for results), as well as daily in-house to aid in process control.

In 2024, there was no instance where the Soluble Nitrogen limit of 10.0 mg/L was exceeded, with the maximum concentration being 5.49 mg/L measured in December. The yearly average for Soluble Nitrogen was 4.14 mg/L, which is in compliance with the permitted annual average limit of 6.0 mg/L.

2.0 General Requirements

2.1 Maintenance of works

District operators complete daily inspections of authorized works located at 4062 Beaver Lake Road and weekly inspections of authorized works within the collection system; copies of these inspection reports are available upon request.

The District utilizes a Computer Maintenance Management System (CMMS) that schedules and tracks all plant maintenance. All equipment is listed in the maintenance database and all manufacturer data and literature is indexed in binders. At a minimum all maintenance is in accordance with the authorized works manufacturer's recommended maintenance schedule.

2.2 Emergency Procedures

No emergency procedures were required in 2024.

2.3 Bypasses

There was no plant bypasses required in 2024.

2.4 Plant Modifications

In 2024, the connection between the Lake Country Wastewater Treatment Plant and the City of Kelowna collection system was completed. With Lake Country's RI basin nearly at full discharge capacity and facing the added pressure of a growing community, this interconnect was developed to provide relief until an alternative disposal method is approved by the Ministry of Environment and Parks. It allows wastewater to be diverted to Kelowna's collection system for further treatment and disposal at the Kelowna WWTP. A meter is installed to monitor flow; see Table 1 for recorded volumes. Constructed

between Fall 2023 and Spring 2024, this interconnect enhances operational flexibility, supports growth, and ensures regulatory compliance and reliable wastewater management.

Figure 3: Installation of the vault housing the meter for the discharge to the City of Kelowna Collection System.

Figure 4: Location of interconnect between Lake Country WWTP and City of Kelowna Collection System

2.5 Facility Classification and Operator Certification

The Environmental Operators Certification Program (EOCP) classifies the LCWWTP as a Class IV facility and the Collection System as a Class I system. All four staff members at the LCWWTP are EOCP-certified as wastewater treatment operators, and the majority also hold certification as wastewater collection operators. The specific levels of certification are displayed in Table 3.

Table 3: EOCP certification level

Operator	Wastewater Treatment Level	Wastewater Collections Level
Davin Larsen (Crew Lead)	IV	II
Mike Davis	IV	II
Shelby McFarlane	III*	-
Jeremy Engelbrecht*	IV	-

*Shelby McFarlane obtained their level 3 EOCP certification in Wastewater Treatment in October 2024.

2.6 Qualified Professional

This report was prepared by the AScT-certified staff at the Wastewater Treatment facility. The necessary data for the report has been collected and analyzed using the appropriate methods outlined in the British Columbia Field Sampling Manual (2013 ed.) and the British Columbia Environmental Laboratory Manual (2023 ed.). Accredited lab services were employed where necessary, and the results have been uploaded to the EMS database. Additionally, a third-party qualified professional has been contracted to review all data and the report itself to enhance transparency.

2.7 Plans-Works

All existing and currently constructed authorized works have been certified by a Qualified Professional and constructed to the appropriate standards, in accordance with the requirement set forth by the Operational Certificate.

2.8 Operation and Maintenance

The District of Lake Country maintains a Wastewater Treatment Operation and Maintenance Manual. This manual encompasses design criteria, process descriptions, maintenance protocols, and standard operating procedures for various functions commonly performed within the facilities.

2.9 Contingency Plan

In 2021, the District finalized a Wastewater Operations Contingency Plan, designed to establish protocols for handling preconceived emergencies as outlined in section 2.9 of the Operational Certificate. This plan serves as supplementary material to guide new operators and assist current operators in responding appropriately in the event of a critical failure at any stage of the wastewater handling processes. The primary objective of this plan is to uphold public health and safety, as well as safeguard the surrounding natural environment. A copy of the Wastewater Operations Contingency Plan is available upon request.

2.10 Sludge Management

The biosolids produced by the wastewater treatment plant process are transported to both the Ogogrow Production Facility and Curtis Farms. There, they undergo beneficial reuse to produce a soil amendment.

Figure 5: Ogogrow Production Facility

2.10.1 Sludge Volume Measurement

Table 4 details the total amount of dewatered sludge hauled to the Ogogrow Production Facility and Curtis Farms. Exact dates of sludge disposal, quantities, and disposal locations are available upon request.

Table 4: Dewatered Sludge Quantities

2024	Monthly Totals	
	Number of Loads	Dry Weight (Tonnes)*
January	15	128.4
February	15	125.3
March	19	138.7
April	22	175.4
May	25	212.6
June	22	178.7
July	20	189.3
August	22	164.3
September	19	161.5
October	23	217.0
November	19	161.9
December	15	125.2
Total	**236**	**1,978.3**

*Estimated weights based on solids concentrations of sludge samples.

2.10.2 Sludge Sampling Program

Dewatered sludge samples are sent to an accredited lab monthly. The results of this monitoring are available upon request.

2.11 Infiltration Facilities

The plant effluent is directed to the infiltration works, comprising of three open rapid infiltration basins and two subsurface tile disposal fields. Only one subsurface tile disposal field is currently utilized. The basins are rotated weekly to provide a rest period and are regularly cleaned to eliminate solid build-up on the sacrificial sand layer. Every one to two years, the sand layer is refreshed with prewashed 2- and 3-mm sand. Effluent filters were integrated into the LCWWTP in 2023, following extensive rehabilitation work on the fields in 2022. Consequently, the infiltration works performed exceptionally well in 2024. There were no overflow occurrences in 2024.

2.12 Sewage Collection System

The District of Lake Country's Wastewater Collection system comprises 12 lift stations and 85.6 km of sanitary sewer mains. Additionally, the system features various appurtenances such as air valves, siphon chambers, and odour chemical dosing stations. Recognized as a Level I Collection System by the EOCP, it serves over 4,066 residential sanitary sewer service equivalences.

District operations conduct weekly inspections of the collection lift stations and frequently inspect other major appurtenances. Records of these inspections are available upon request. Furthermore, annual sewer main cleaning is performed in identified vulnerable areas.

2.12.1 Infiltration, Inflow and Cross Connections

While consistent infiltration issues have not been observed, certain sources of inflow from properties grappling with drainage from flood events and a high groundwater table have been identified. The District of Lake Country has been in communication with multiple properties and continues to address these issues on a case-by-case basis.

Additionally, the District utilizes 5 "Smartcovers" to remotely monitor sanitary manholes for variations in flow and level. These tools aid operators in pinpointing sources of infiltration and inflow and serve as an alarm system for sanitary sewer overflows in high-risk areas.

2.13 Domestic Wells

By way of nutrient discharge there has been no evidence of adverse groundwater impact from the wastewater treatment disposal system. In the event there was any impact the District could supply potable water to those affected. Private well data and supporting analysis can be found in the ground water monitoring report in Appendix D, developed by a third-party qualified professional (Quarmby Environmental Ltd.).

2.14 Groundwater Extraction

In March of 2004, the District of Lake Country installed a groundwater extraction well intended to pump groundwater from the southwest corner of the Wastewater Treatment Plant property into Middle Vernon Creek at the south end of Swalwell Park. However, this groundwater well has remained unused since its installation.

The District is working with the Ministry of Environment and Parks and the Ministry of Water, Land, and Resource Stewardship to explore potential uses for the well, including supporting Lake Country's reclaimed water reuse strategy and augmenting flows in Middle Vernon Creek.

2.15 Irrigation

Treated effluent is only used for wastewater treatment plant process water and not used in the irrigation of any property.

3.0 Monitoring Requirements

3.1 Influent and Effluent Monitoring

The District's monitoring program adheres to the guidelines outlined in sections 3.1 and 3.2 of the Operational Certificate. Plant influent and effluent samples are sent to an accredited laboratory on a monthly basis. Effluent flow meter readings are automatically recorded and stored in the wastewater lab data management system, Hach Wims, with daily checks conducted. Table 1 provides a summary of the LCWWTP influent and effluent flows, while Table 2 tabulates the accredited lab data for effluent samples. Additionally, Table 5 presents the influent accredited lab data. Copies of the accredited lab reports are available in Appendix B.

Table 5: 2023 Influent accredited lab data

	CBOD5 (mg/L)	TSS (mg/L)	Total P (mg/L)	Total Nitrogen (mg/L)	pH
January	297	236	10.00	80.00	8.07
February	480	496	13.90	90.40	7.97
March	306	336	9.88	81.20	7.99
April	282	282	10.80	100.00	8.23
May	333	357	13.50	113.00	7.84
June	390	310	14.50	102.00	7.79
July	494	428	13.30	107.00	7.96
August	385	312	15.80	85.70	7.77
September	372	332	14.10	114.00	7.86
October	423	380	15.20	120.00	8.09
November	324	322	12.90	88.30	8.20
December	546	300	9.02	99.60	8.24
Annual Average	**386**	**341**	**12.74**	**98.43**	**8.00**

3.2 Groundwater Monitoring

The groundwater monitoring program has been developed by a third-party qualified professional (Quarmby Environmental Ltd.) and encompasses the monitoring of various aspects, including:

- Groundwater flow patterns
- Groundwater quality

- Nutrient removal capability of the soil
- Groundwater levels
- Advanced notice of impending high groundwater issues
- Elevated phosphorus or nitrate levels potentially attributed to effluent disposal

The groundwater monitoring program is detailed in Section 3.2 of the Operational Certificate. A map illustrating the locations of monitoring wells can be referenced in Appendix E, while the summarized data is presented in a memorandum from Quarmby Environmental, available in Appendix D.

3.3 Modification of the Monitoring Program

The current monitoring program was developed as part of the 2021 Operational Certificate amendment. In October 2024, the Operational Certificate was further amended to remove the H6 Domestic Well at 9719 McCarthy Road from the groundwater monitoring program, following a request submitted by the District on June 27, 2023. The well was no longer accessible after the property was sold and repurposed for an industrial marijuana operation with enhanced security measures.

3.4 Sampling Facilities & Procedures

The District has installed and maintains sampling facilities for all sample sites. All procedures for the sampling, storing, and transporting of samples are in accordance with the BC Field Sampling Manual and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples, 2013 Edition.

3.5 Analytical Procedures

The District follows and submits samples for laboratory analysis in accordance with the British Columbia Environmental Laboratory Manual, 2023 Edition.

3.6 Quality Assurance

The District of Lake Country engages Caro Analytical Services for their accredited lab testing needs. In addition to providing sample results, Caro includes a copy of their quality assurance/quality control report with each submission, which incorporates an equipment blank. Caro is certified by the Canadian Accredited Laboratories Association (CALA) and accredited by the International Standards Organization (ISO).

In-house testing conducted at the LCWWTP lab strictly adheres to the BC Field Sampling Manual, 2013 edition, for water and wastewater analysis. Operators routinely calibrate lab equipment and employ various quality control measures such as blanks, duplicates, and split samples during sampling procedures. Although this lab is not accredited, the data generated is solely utilized for operational purposes and is not used for reporting purposes.

4.0 Reporting Requirements

All data from LCWWTP analysis and flow measurements required under the operational certificate is collected and stored within the web-based software program Hach Wims. This information is readily accessible for review upon request.

4.1 Non–Compliance Notification and Reporting

All instances of non-compliance are promptly communicated to the Director via email within the specified 30-day period. These notifications include an explanation of the most probable cause(s) of the non-compliance, and a description of the remedial action planned and/or taken to prevent similar non-compliance(s) in the future. Additionally, any lab data, photographs, and supporting documents are included in the report. Reports of non-compliance can be located in Appendix C.

4.2 EMS Reporting

All laboratory data analyzed by a qualified laboratory is inputted into the Environmental Monitoring System (EMS) by the accredited laboratory within 30 days from the date of sample collection.

4.3 Annual Reporting

4.3.1 Exceedances

The LCWWTP experienced 1 non-compliances in 2024. A Non-Compliance Report was sent to Ministry of Environment and Parks and can be found in Appendix C. A summary of this exceedance/non compliance is below:

Ortho Phosphorus exceedance (1) – The 2024 annual average for Ortho-Phosphorus was 0.32 mg/L, exceeding the Operational Certificate requirement of 0.15 mg/L. However, levels remained below the maximum daily limit of 1.5 mg/L throughout the year, with a peak concentration of 1.00 mg/L recorded in September. The increase in the annual average is attributed to additional nutrient loading from the septage receiving station, which is released to the plant's headworks during the centrifuge process. The District of Lake Country has engaged process engineering firms to assess the issue, and upgrades to the sludge storage aeration system are being investigated to help reduce phosphorus release during centrifuging.

4.3.2 Groundwater Reporting

Refer to Appendix D for a report on the groundwater conditions at the LCWWTP and surrounding area.

4.3.3 Plant Performance Trends

Refer to Appendix F for plant trends performance depicted as annual graphs.

4.3.4 Lab reports

Please refer to Table 2 for summarized accredited lab data. Copies of the accredited lab reports can be found in Appendix B.

4.3.5 Quality Assurance Data

The CARO test results, along with their respective quality assurance/quality control reports, can be found in Appendix B.

4.3.6 Sludge Management Recording

Please refer to section 2.10 of this report

4.3.7 Evaluation of Authorized works

The LCWWTP is currently in good overall condition, having undergone upgrades in 2015 and 2023, with another upgrade scheduled within the next 3 to 5 years. The District is proactively identifying components for both current and future upgrade and replacement needs, strategically addressing the challenges posed by community growth and increasing flows. One key measure involves exploring alternative methods of effluent disposal to manage these demands effectively.

The District is also in the final stages of its Liquid Waste Management Plan (LWMP), which outlines a long-term strategy for wastewater treatment, effluent disposal, and environmental protection. The plan aims to ensure regulatory compliance, support sustainable community growth, and protect public and environmental health.

4.3.8 Contingency Plan

A contingency plan for the LCWWTP and collection system was created in 2021 and submitted to the Ministry of Environment and Parks on January 12th, 2022. There have been no further updates to the plan since its submission.

Appendix A - Total Daily Flows

Effluent Discharge (m3)

	January		February		March		April		May		June	
Date	To City of Kelowna Colletion System (m3)	to Basins (m3)	To City of Kelowna Colletion System (m3)	to Basins (m3)	To City of Kelowna Colletion System (m3)	to Basins (m3)	To City of Kelowna Colletion System (m3)	to Basins (m3)	To City of Kelowna Colletion System (m3)	to Basins (m3)	To City of Kelowna Colletion System (m3)	to Basins (m3)
1	0	1,781	0	1,871	0	1,871	0	1,894	230	1,615	186	1,579
2	0	1,797	0	1,816	0	1,878	0	1,825	194	1,596	228	1,661
3	0	1,819	0	1,889	0	1,945	0	1,851	151	1,624	257	1,712
4	0	1,817	0	2,040	0	1,963	0	1,901	162	1,667	213	1,612
5	0	1,719	0	1,877	0	1,827	0	1,856	208	1,703	240	1,606
6	0	1,770	0	1,898	0	1,831	0	1,883	157	1,655	214	1,592
7	0	1,880	0	1,896	0	1,877	0	2,009	124	1,644	190	1,585
8	0	1,824	0	1,897	0	1,816	0	1,898	150	1,686	232	1,565
9	0	1,825	0	1,859	0	1,875	0	1,854	135	1,672	299	1,626
10	0	1,803	0	1,878	0	1,917	0	1,904	159	1,644	279	1,617
11	0	1,827	0	1,960	0	1,851	0	1,890	135	1,639	254	1,586
12	0	1,790	0	1,929	0	1,837	0	1,902	177	1,731	231	1,664
13	0	1,882	0	1,930	0	1,856	0	1,922	150	1,728	200	1,657
14	0	1,985	0	1,902	0	1,871	0	2,010	137	1,688	216	1,676
15	0	1,902	0	1,864	0	1,847	0	1,947	200	1,625	204	1,646
16	0	1,846	0	1,844	0	1,862	0	1,900	202	1,628	244	1,716
17	0	1,777	0	1,851	0	1,925	0	1,897	203	1,620	260	1,711
18	0	1,790	0	1,924	0	1,779	0	1,827	190	1,576	266	1,714
19	0	1,759	0	1,964	0	1,745	0	1,878	194	1,573	224	1,740
20	0	1,712	0	1,928	0	1,740	0	1,872	241	1,662	206	1,726
21	0	1,862	0	1,805	0	1,744	0	1,898	233	1,632	206	1,723
22	0	1,823	0	1,806	0	1,768	0	1,850	223	1,802	177	1,628
23	0	2,046	0	1,787	0	1,795	197	1,591	122	1,719	204	1,685
24	0	1,849	0	1,859	0	1,878	207	1,574	173	1,591	194	1,655
25	0	1,843	0	1,947	0	1,833	213	1,613	228	1,646	183	1,658
26	0	1,838	0	1,816	0	1,806	197	1,585	272	1,679	205	1,674
27	0	1,922	0	1,892	0	1,848	221	1,577	214	1,653	178	1,694
28	0	2,039	0	1,841	0	1,784	276	1,647	178	1,604	182	1,688
29	0	1,935	0	1,864	0	1,870	233	1,603	206	1,612	175	1,607
30	0	1,879			0	1,831	221	1,604	221	1,625	38	1,859
31	0	1,868			0	1874			173	1572		
Min	0	1,712	0	1,787	0	1,740	0	1,574	122	1,572	38	1,565
Max	0	2,046	0	2,040	0	1,963	276	2,010	272	1,802	299	1,859
Average	0	1,845	0	1,884	0	1,843	59	1,815	185	1,649	213	1,662
Total	0	57,209	0	54,634	0	57,144	1,765	54,462	5,742	51,111	6,385	49,862

	July		August		September		October		Noevember		December	
Date	To City of Kelowna Colletion System (m3)	to Basins (m3)	To City of Kelowna Colletion System (m3)	to Basins (m3)	To City of Kelowna Colletion System (m3)	to Basins (m3)	To City of Kelowna Colletion System (m3)	to Basins (m3)	To City of Kelowna Colletion System (m3)	to Basins (m3)	To City of Kelowna Colletion System (m3)	to Basins (m3)
1	0	2,006	278	1,694	274	1,481	273	1,639	281	1,507	0	1,941
2	208	1,705	249	1,665	297	1,673	346	1,551	57	1,794	0	1,848
3	240	1,681	252	1,633	0	1,846	340	1,572	0	1,979	163	1,737
4	239	1,674	242	1,657	233	1,527	314	1,568	187	1,730	246	1,620
5	236	1,674	291	1,679	292	1,502	308	1,506	195	1,680	251	1,592
6	226	1,628	258	1,683	256	1,479	338	1,524	281	1,574	209	1,555
7	252	1,643	243	1,647	286	1,435	358	1,595	301	1,543	48	1,750
8	253	1,636	212	1,683	340	1,535	319	1,523	289	1,521	0	1,908
9	214	1,661	184	1,673	338	1,518	291	1,492	45	1,773	248	1,641
10	201	1,721	185	1,640	306	1,489	278	1,575	0	1,828	244	1,570
11	179	1,684	232	1,703	279	1,516	258	1,549	0	1,905	253	1,606
12	173	1,668	254	1,738	238	1,531	273	1,567	0	1,853	274	1,600
13	185	1,668	186	1,769	237	1,529	290	1,560	133	1,724	285	1,531
14	195	1,686	242	1,672	269	1,524	120	1,811	225	1,555	53	1,767
15	191	1,681	248	1,620	316	1,578	195	1,688	227	1,544	0	1,909
16	156	1,765	265	1,608	275	1,566	264	1,568	70	1,775	0	1,802
17	214	1,636	278	1,576	256	1,545	258	1,578	0	1,970	211	1,602
18	225	1,680	309	1,590	268	1,581	319	1,517	224	1,681	461	1,510
19	211	1,643	265	1,493	254	1,536	282	1,540	230	1,591	414	1,491
20	223	1,622	273	1,549	213	1,493	264	1,736	225	1,584	406	1,459
21	252	1,662	219	1,601	233	1,509	0	1,854	235	1,609	129	1,825
22	245	1,721	184	1,614	309	1,575	279	1,555	236	1,608	0	1,868
23	98	718	221	1,607	268	1,584	280	1,554	58	1,748	135	1,696
24	68	2,231	333	1,562	251	1,555	297	1,491	0	1,908	81	1,773
25	0	2,284	337	1,547	256	1,556	327	1,495	213	1,623	0	1,705
26	102	1,997	287	1,541	345	1,533	78	1,780	239	1,623	0	1,762
27	210	1,711	293	1,559	348	1,457	0	2,041	233	1,602	0	1,781
28	224	1,731	284	1,523	345	1,413	333	1,537	232	1,617	0	1,859
29	237	1,733	255	1,527	380	1,446	334	1,497	218	1,569	0	1,835
30	221	1,746	282	1,537	184	1,822	340	1,529	28	1,881	228	1,597
31	203	1,695	273	1,505			275	1,511			67	1,791
Min	0	718	184	1,493	0	1,413	0	1,491	0	1,507	0	1,459
Max	253	2,284	337	1,769	380	1,846	358	2,041	301	1,979	461	1,941
Average	190	1,709	255	1,616	272	1,544	266	1,597	155	1,697	142	1,707
Total	5,881	52,991	7,914	50,095	8,146	46,334	8,231	49,503	4,662	50,899	4,406	52,931

Appendix B – Accredited Laboratory Reports

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24D0503
PO NUMBER		**RECEIVED / TEMP**	2024-04-03 11:37 / 12.1°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-04-10 09:49
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45385.36309

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0503
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-04-10 09:49

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24D0503-01) | Matrix: Wastewater | Sampled: 2024-04-03 09:00					
Anions					
Chloride	**152**	0.10	mg/L	2024-04-05	
Nitrate (as N)	**1.39**	0.010	mg/L	2024-04-05	
Nitrite (as N)	**0.173**	0.010	mg/L	2024-04-05	
Phosphate (as P)	**0.0620**	0.0050	mg/L	2024-04-05	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.57**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.27**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.50**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**189**	1.0	mg/L	2024-04-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-04-05	
Alkalinity, Bicarbonate (as CaCO3)	**189**	1.0	mg/L	2024-04-05	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-04-05	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-04-05	
Ammonia, Total (as N)	**2.20**	0.050	mg/L	2024-04-09	
BOD, 5-day Carbonaceous	**3.1**	2.0	mg/L	2024-04-09	
Nitrogen, Total Kjeldahl	**3.70**	0.050	mg/L	2024-04-09	
pH	**7.63**	0.10	pH units	2024-04-05	HT2
Phosphorus, Total (as P)	**0.213**	0.0050	mg/L	2024-04-05	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-04-06	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**199000**	1	MPN/100 mL	2024-04-04	
Coliforms, Fecal (Q-Tray)	**17300**	1	MPN/100 mL	2024-04-04	
Trip Blank (24D0503-02) | Matrix: Wastewater | Sampled: 2024-04-03 08:45					
Anions					
Chloride	< 0.10	0.10	mg/L	2024-04-05	
Nitrate (as N)	< 0.010	0.010	mg/L	2024-04-05	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-04-05	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2024-04-05	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2024-04-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-04-05	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-04-05	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0503
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-04-10 09:49

Analyte	Result	RL	Units	Analyzed	Qualifier
Trip Blank (24D0503-02) | Matrix: Wastewater | Sampled: 2024-04-03 08:45, Continued					
General Parameters, Continued					
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-04-05	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-04-05	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2024-04-09	
BOD, 5-day Carbonaceous	< 3.1	2.0	mg/L	2024-04-09	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2024-04-09	
pH	**5.48**	0.10	pH units	2024-04-05	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2024-04-05	
Solids, Total Suspended	< 4.3	2.0	mg/L	2024-04-06	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2024-04-04	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2024-04-04	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0503
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-04-10 09:49

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0503
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-04-10 09:49

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4D1558										
Blank (B4D1558-BLK1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4D1558-BS1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Chloride	16.1	0.10	mg/L	16.0		101	90-110			
Nitrate (as N)	4.13	0.010	mg/L	4.00		103	90-110			
Nitrite (as N)	2.09	0.010	mg/L	2.00		105	85-115			
Anions, Batch B4D1673										
Blank (B4D1673-BLK1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B4D1673-BS1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Phosphate (as P)	0.106	0.0050	mg/L	0.100		106	80-120			
Duplicate (B4D1673-DUP1)			**Source: 24D0503-01**	Prepared: 2024-04-05, Analyzed: 2024-04-05						
Phosphate (as P)	0.0620	0.0050	mg/L		0.0620			< 1	20	
General Parameters, Batch B4D1556										
Blank (B4D1556-BLK1)				Prepared: 2024-04-04, Analyzed: 2024-04-09						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4D1556-BS1)				Prepared: 2024-04-04, Analyzed: 2024-04-09						
BOD, 5-day Carbonaceous	191	50.8	mg/L	198		97	85-115			
General Parameters, Batch B4D1594										
Blank (B4D1594-BLK2)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4D1594-BLK3)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0503
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-04-10 09:49

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4D1594, Continued										
Blank (B4D1594-BLK4)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4D1594-BS2)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	0.103	0.0050	mg/L	0.100		103	85-115			
LCS (B4D1594-BS3)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	0.103	0.0050	mg/L	0.100		103	85-115			
LCS (B4D1594-BS4)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	0.103	0.0050	mg/L	0.100		103	85-115			
General Parameters, Batch B4D1654										
Blank (B4D1654-BLK1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.37	0.10	pH units							
Blank (B4D1654-BLK2)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.44	0.10	pH units							
Blank (B4D1654-BLK3)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.45	0.10	pH units							
LCS (B4D1654-BS1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	74.5	1.0	mg/L	50.0		149	0-200			
LCS (B4D1654-BS2)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	67.0	1.0	mg/L	50.0		134	0-200			
LCS (B4D1654-BS3)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	100	1.0	mg/L	100		100	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	53.9	1.0	mg/L	50.0		108	0-200			
Reference (B4D1654-SRM1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4D1654-SRM2)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4D1654-SRM3)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
pH	7.03	0.10	pH units	7.01		100	98-102			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0503
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-04-10 09:49

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4D1782										
Blank (B4D1782-BLK1)				Prepared: 2024-04-06, Analyzed: 2024-04-06						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4D1782-BS1)				Prepared: 2024-04-06, Analyzed: 2024-04-06						
Solids, Total Suspended	89.9	10.1	mg/L	100		90	85-115			
General Parameters, Batch B4D1911										
Blank (B4D1911-BLK1)				Prepared: 2024-04-08, Analyzed: 2024-04-09						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4D1911-BLK2)				Prepared: 2024-04-08, Analyzed: 2024-04-09						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4D1911-BS1)				Prepared: 2024-04-08, Analyzed: 2024-04-09						
Nitrogen, Total Kjeldahl	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4D1911-BS2)				Prepared: 2024-04-08, Analyzed: 2024-04-09						
Nitrogen, Total Kjeldahl	1.04	0.050	mg/L	1.00		104	85-115			
General Parameters, Batch B4D1946										
Blank (B4D1946-BLK1)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4D1946-BLK2)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4D1946-BLK3)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4D1946-BLK4)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4D1946-BS1)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	0.972	0.050	mg/L	1.00		97	85-115			
LCS (B4D1946-BS2)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	0.978	0.050	mg/L	1.00		98	85-115			
LCS (B4D1946-BS3)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	0.984	0.050	mg/L	1.00		98	85-115			
LCS (B4D1946-BS4)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	0.990	0.050	mg/L	1.00		99	85-115			
Duplicate (B4D1946-DUP3)		**Source: 24D0503-01**		Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	2.20	0.050	mg/L		2.20			< 1	15	
Matrix Spike (B4D1946-MS3)		**Source: 24D0503-01**		Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	2.39	0.050	mg/L	0.204	2.20	95	75-125			
Microbiological Parameters, Batch B4D1518										
Blank (B4D1518-BLK1)				Prepared: 2024-04-04, Analyzed: 2024-04-04						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0503
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-04-10 09:49

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Microbiological Parameters, Batch B4D1518, Continued										
Blank (B4D1518-BLK2)				Prepared: 2024-04-04, Analyzed: 2024-04-04						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4D1518-BLK3)				Prepared: 2024-04-04, Analyzed: 2024-04-04						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24D0501
PO NUMBER		**RECEIVED / TEMP**	2024-04-03 11:37 / 12.1°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-04-10 15:17
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45385.36309

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

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If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0501
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-04-10 15:17

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (24D0501-01) | Matrix: Wastewater | Sampled: 2024-04-03 09:30					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2024-04-05	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-04-05	
Phosphate (as P)	**6.45**	0.0050	mg/L	2024-04-05	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**100**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**406**	1.0	mg/L	2024-04-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-04-05	
Alkalinity, Bicarbonate (as CaCO3)	**406**	1.0	mg/L	2024-04-05	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-04-05	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-04-05	
Ammonia, Total (as N)	**64.9**	0.050	mg/L	2024-04-09	
BOD, 5-day	**293**	2.0	mg/L	2024-04-10	
BOD, 5-day Carbonaceous	**282**	2.0	mg/L	2024-04-09	
Nitrogen, Total Kjeldahl	**100**	0.050	mg/L	2024-04-09	
pH	**8.23**	0.10	pH units	2024-04-05	HT2
Phosphorus, Total (as P)	**10.8**	0.0050	mg/L	2024-04-05	
Solids, Total Suspended	**282**	2.0	mg/L	2024-04-06	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0501
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-04-10 15:17

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0501
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-04-10 15:17

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4D1558										
Blank (B4D1558-BLK1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4D1558-BS1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Nitrate (as N)	4.13	0.010	mg/L	4.00		103	90-110			
Nitrite (as N)	2.09	0.010	mg/L	2.00		105	85-115			
Anions, Batch B4D1673										
Blank (B4D1673-BLK1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B4D1673-BS1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Phosphate (as P)	0.106	0.0050	mg/L	0.100		106	80-120			
General Parameters, Batch B4D1556										
Blank (B4D1556-BLK1)				Prepared: 2024-04-04, Analyzed: 2024-04-09						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4D1556-BS1)				Prepared: 2024-04-04, Analyzed: 2024-04-09						
BOD, 5-day Carbonaceous	191	50.8	mg/L	198		97	85-115			
General Parameters, Batch B4D1594										
Blank (B4D1594-BLK2)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4D1594-BLK3)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4D1594-BLK4)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0501
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-04-10 15:17

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4D1594, Continued										
LCS (B4D1594-BS2)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	0.103	0.0050	mg/L	0.100		103	85-115			
LCS (B4D1594-BS3)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	0.103	0.0050	mg/L	0.100		103	85-115			
LCS (B4D1594-BS4)				Prepared: 2024-04-04, Analyzed: 2024-04-05						
Phosphorus, Total (as P)	0.103	0.0050	mg/L	0.100		103	85-115			
General Parameters, Batch B4D1654										
Blank (B4D1654-BLK1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.37	0.10	pH units							
Blank (B4D1654-BLK2)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.44	0.10	pH units							
Blank (B4D1654-BLK3)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.45	0.10	pH units							
LCS (B4D1654-BS1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	74.5	1.0	mg/L	50.0		149	0-200			
LCS (B4D1654-BS2)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	67.0	1.0	mg/L	50.0		134	0-200			
LCS (B4D1654-BS3)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
Alkalinity, Total (as CaCO3)	100	1.0	mg/L	100		100	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	53.9	1.0	mg/L	50.0		108	0-200			
Reference (B4D1654-SRM1)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4D1654-SRM2)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4D1654-SRM3)				Prepared: 2024-04-05, Analyzed: 2024-04-05						
pH	7.03	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4D1677										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24D0501
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-04-10 15:17

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4D1677, Continued										
Blank (B4D1677-BLK1)				Prepared: 2024-04-05, Analyzed: 2024-04-10						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B4D1677-BS1)				Prepared: 2024-04-05, Analyzed: 2024-04-10						
BOD, 5-day	187	54.1	mg/L	198		95	85-115			
General Parameters, Batch B4D1782										
Blank (B4D1782-BLK1)				Prepared: 2024-04-06, Analyzed: 2024-04-06						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4D1782-BS1)				Prepared: 2024-04-06, Analyzed: 2024-04-06						
Solids, Total Suspended	89.9	10.1	mg/L	100		90	85-115			
General Parameters, Batch B4D1911										
Blank (B4D1911-BLK1)				Prepared: 2024-04-08, Analyzed: 2024-04-09						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4D1911-BLK2)				Prepared: 2024-04-08, Analyzed: 2024-04-09						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4D1911-BS1)				Prepared: 2024-04-08, Analyzed: 2024-04-09						
Nitrogen, Total Kjeldahl	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4D1911-BS2)				Prepared: 2024-04-08, Analyzed: 2024-04-09						
Nitrogen, Total Kjeldahl	1.04	0.050	mg/L	1.00		104	85-115			
General Parameters, Batch B4D1946										
Blank (B4D1946-BLK1)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4D1946-BLK2)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4D1946-BLK3)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4D1946-BLK4)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4D1946-BS1)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	0.972	0.050	mg/L	1.00		97	85-115			
LCS (B4D1946-BS2)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	0.978	0.050	mg/L	1.00		98	85-115			
LCS (B4D1946-BS3)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	0.984	0.050	mg/L	1.00		98	85-115			
LCS (B4D1946-BS4)				Prepared: 2024-04-09, Analyzed: 2024-04-09						
Ammonia, Total (as N)	0.990	0.050	mg/L	1.00		99	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24H2595
PO NUMBER		**RECEIVED / TEMP**	2024-08-20 11:48 / 19.6°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-29 16:24
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45524.36690

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

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We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

Work Order Comments:

This is a revised report; please refer to Appendix 3 for details.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-29 16:24

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24H2595-01) | Matrix: Wastewater | Sampled: 2024-08-20 09:56					
Anions					
Chloride	**129**	0.10	mg/L	2024-08-22	
Nitrate (as N)	**1.65**	0.010	mg/L	2024-08-22	
Nitrite (as N)	**0.143**	0.010	mg/L	2024-08-22	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.79**	0.0100	mg/L	N/A	
Nitrogen, Total	**3.24**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.23**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**161**	1.0	mg/L	2024-08-23	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	
Alkalinity, Bicarbonate (as CaCO3)	**161**	1.0	mg/L	2024-08-23	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	
Ammonia, Total (as N)	**0.223**	0.050	mg/L	2024-08-23	
BOD, 5-day Carbonaceous	< 4.7	2.0	mg/L	2024-08-26	
Nitrogen, Total Kjeldahl	**1.45**	0.050	mg/L	2024-08-24	
pH	**8.06**	0.10	pH units	2024-08-23	HT2
Phosphorus, Total (as P)	**0.609**	0.0050	mg/L	2024-08-22	
Phosphorus, Dissolved Reactive	**0.431**	0.0050	mg/L	2024-05-22	HT1
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-08-23	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**> 242000**	1	MPN/100 mL	2024-08-21	
Coliforms, Fecal (Q-Tray)	**81600**	1	MPN/100 mL	2024-08-21	
Trip Blank (24H2595-02) | Matrix: Wastewater | Sampled: 2024-08-20 10:45					
Anions					
Chloride	**0.25**	0.10	mg/L	2024-08-22	RE2
Nitrate (as N)	< 0.010	0.010	mg/L	2024-08-22	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-08-22	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**1.2**	1.0	mg/L	2024-08-23	RE2
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	RE2
Alkalinity, Bicarbonate (as CaCO3)	**1.2**	1.0	mg/L	2024-08-23	RE2
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	RE2

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-29 16:24

Analyte	Result	RL	Units	Analyzed	Qualifier
Trip Blank (24H2595-02) | Matrix: Wastewater | Sampled: 2024-08-20 10:45, Continued					
General Parameters, Continued					
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	RE2
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2024-08-23	
BOD, 5-day Carbonaceous	< 4.7	2.0	mg/L	2024-08-26	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2024-08-24	
pH	**6.79**	0.10	pH units	2024-08-23	HT2, RE2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2024-08-22	
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L	2024-08-22	
Solids, Total Suspended	< 10.0	2.0	mg/L	2024-08-23	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2024-08-21	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2024-08-21	

Sample Qualifiers:

HT1	The sample was prepared and/or analyzed past the recommended holding time.
HT2	The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
RE2	Result was confirmed by re-analysis prior to reporting.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-29 16:24

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
>	Greater than the specified Result
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-29 16:24

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-29 16:24

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4H3451										
Blank (B4H3451-BLK1)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4H3451-BS1)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Chloride	16.0	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	3.96	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.06	0.010	mg/L	2.00		103	85-115			
General Parameters, Batch B4H3447										
Blank (B4H3447-BLK1)				Prepared: 2024-08-21, Analyzed: 2024-08-26						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4H3447-BS1)				Prepared: 2024-08-21, Analyzed: 2024-08-26						
BOD, 5-day Carbonaceous	225	55.4	mg/L	198		114	85-115			
General Parameters, Batch B4H3506										
Blank (B4H3506-BLK1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4H3506-BLK2)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4H3506-BS1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	0.104	0.0050	mg/L	0.100		104	85-115			
LCS (B4H3506-BS2)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
General Parameters, Batch B4H3540										
Blank (B4H3540-BLK1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-29 16:24

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4H3540, Continued										
LCS (B4H3540-BS1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Dissolved Reactive	0.0970	0.0050	mg/L	0.100		97	84-115			
General Parameters, Batch B4H3654										
Blank (B4H3654-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK3)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK4)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK5)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4H3654-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.00	0.050	mg/L	1.00		100	85-115			
LCS (B4H3654-BS2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.05	0.050	mg/L	1.00		105	85-115			
LCS (B4H3654-BS3)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4H3654-BS4)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4H3654-BS5)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	85-115			
General Parameters, Batch B4H3672										
Blank (B4H3672-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4H3672-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Solids, Total Suspended	114	5.1	mg/L	100		114	85-115			
General Parameters, Batch B4H3711										
Blank (B4H3711-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4H3711-BLK2)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4H3711-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	1.01	0.050	mg/L	1.00		101	85-115			
LCS (B4H3711-BS2)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	0.961	0.050	mg/L	1.00		96	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-29 16:24

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4H3716										
Blank (B4H3716-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4H3716-BLK2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4H3716-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	95.7	1.0	mg/L	100		96	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	38.2	1.0	mg/L	50.0		76	0-200			
LCS (B4H3716-BS3)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	94.8	1.0	mg/L	100		95	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	35.8	1.0	mg/L	50.0		72	0-200			
Reference (B4H3716-SRM1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
pH	7.01	0.10	pH units	7.01		100	98-102			
Reference (B4H3716-SRM2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
pH	7.02	0.10	pH units	7.01		100	98-102			
Microbiological Parameters, Batch B4H3396										
Blank (B4H3396-BLK1)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4H3396-BLK2)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4H3396-BLK3)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4H3396-BLK4)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4H3396-BLK5)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4H3396-BLK6)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							

APPENDIX 3: REVISION HISTORY

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-29 16:24

Sample ID	Changed	Change	Analysis	Analyte(s)
24H2595-01	2024-08-29	Result Revised	Phosphorus, Dissolved Reactive	Phosphorus, Dissolved Reactive

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24H2595
PO NUMBER		**RECEIVED / TEMP**	2024-08-20 11:48 / 19.6°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-28 09:03
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45524.36690

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-28 09:03

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24H2595-01) | Matrix: Wastewater | Sampled: 2024-08-20 09:56					
Anions					
Chloride	**129**	0.10	mg/L	2024-08-22	
Nitrate (as N)	**1.65**	0.010	mg/L	2024-08-22	
Nitrite (as N)	**0.143**	0.010	mg/L	2024-08-22	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.79**	0.0100	mg/L	N/A	
Nitrogen, Total	**3.24**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.23**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**161**	1.0	mg/L	2024-08-23	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	
Alkalinity, Bicarbonate (as CaCO3)	**161**	1.0	mg/L	2024-08-23	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	
Ammonia, Total (as N)	**0.223**	0.050	mg/L	2024-08-23	
BOD, 5-day Carbonaceous	< 4.7	2.0	mg/L	2024-08-26	
Nitrogen, Total Kjeldahl	**1.45**	0.050	mg/L	2024-08-24	
pH	**8.06**	0.10	pH units	2024-08-23	HT2
Phosphorus, Total (as P)	**0.609**	0.0050	mg/L	2024-08-22	
Phosphorus, Dissolved Reactive	**0.0050**	0.0050	mg/L	2024-05-22	HT1
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-08-23	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**> 242000**	1	MPN/100 mL	2024-08-21	
Coliforms, Fecal (Q-Tray)	**81600**	1	MPN/100 mL	2024-08-21	
Trip Blank (24H2595-02) | Matrix: Wastewater | Sampled: 2024-08-20 10:45					
Anions					
Chloride	**0.25**	0.10	mg/L	2024-08-22	RE2
Nitrate (as N)	< 0.010	0.010	mg/L	2024-08-22	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-08-22	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**1.2**	1.0	mg/L	2024-08-23	RE2
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	RE2
Alkalinity, Bicarbonate (as CaCO3)	**1.2**	1.0	mg/L	2024-08-23	RE2
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	RE2

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-28 09:03

Analyte	Result	RL	Units	Analyzed	Qualifier
Trip Blank (24H2595-02) | Matrix: Wastewater | Sampled: 2024-08-20 10:45, Continued					
General Parameters, Continued					
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	RE2
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2024-08-23	
BOD, 5-day Carbonaceous	< 4.7	2.0	mg/L	2024-08-26	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2024-08-24	
pH	**6.79**	0.10	pH units	2024-08-23	HT2, RE2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2024-08-22	
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L	2024-08-22	
Solids, Total Suspended	< 10.0	2.0	mg/L	2024-08-23	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2024-08-21	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2024-08-21	

Sample Qualifiers:

HT1	The sample was prepared and/or analyzed past the recommended holding time.
HT2	The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
RE2	Result was confirmed by re-analysis prior to reporting.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-28 09:03

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
>	Greater than the specified Result
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-28 09:03

General Comments:

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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-28 09:03

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4H3451										
Blank (B4H3451-BLK1)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4H3451-BS1)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Chloride	16.0	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	3.96	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.06	0.010	mg/L	2.00		103	85-115			
General Parameters, Batch B4H3447										
Blank (B4H3447-BLK1)				Prepared: 2024-08-21, Analyzed: 2024-08-26						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4H3447-BS1)				Prepared: 2024-08-21, Analyzed: 2024-08-26						
BOD, 5-day Carbonaceous	225	55.4	mg/L	198		114	85-115			
General Parameters, Batch B4H3506										
Blank (B4H3506-BLK1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4H3506-BLK2)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4H3506-BS1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	0.104	0.0050	mg/L	0.100		104	85-115			
LCS (B4H3506-BS2)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
General Parameters, Batch B4H3540										
Blank (B4H3540-BLK1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-28 09:03

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4H3540, Continued										
LCS (B4H3540-BS1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Dissolved Reactive	0.0970	0.0050	mg/L	0.100		97	84-115			
General Parameters, Batch B4H3654										
Blank (B4H3654-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK3)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK4)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK5)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4H3654-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.00	0.050	mg/L	1.00		100	85-115			
LCS (B4H3654-BS2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.05	0.050	mg/L	1.00		105	85-115			
LCS (B4H3654-BS3)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4H3654-BS4)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4H3654-BS5)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	85-115			
General Parameters, Batch B4H3672										
Blank (B4H3672-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4H3672-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Solids, Total Suspended	114	5.1	mg/L	100		114	85-115			
General Parameters, Batch B4H3711										
Blank (B4H3711-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4H3711-BLK2)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4H3711-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	1.01	0.050	mg/L	1.00		101	85-115			
LCS (B4H3711-BS2)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	0.961	0.050	mg/L	1.00		96	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2595
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-08-28 09:03

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4H3716										
Blank (B4H3716-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4H3716-BLK2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4H3716-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	95.7	1.0	mg/L	100		96	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	38.2	1.0	mg/L	50.0		76	0-200			
LCS (B4H3716-BS3)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	94.8	1.0	mg/L	100		95	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	35.8	1.0	mg/L	50.0		72	0-200			
Reference (B4H3716-SRM1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
pH	7.01	0.10	pH units	7.01		100	98-102			
Reference (B4H3716-SRM2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
pH	7.02	0.10	pH units	7.01		100	98-102			
Microbiological Parameters, Batch B4H3396										
Blank (B4H3396-BLK1)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4H3396-BLK2)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4H3396-BLK3)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4H3396-BLK4)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4H3396-BLK5)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4H3396-BLK6)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24H2594
PO NUMBER		**RECEIVED / TEMP**	2024-08-20 11:48 / 19.6°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-08-27 11:30
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45524.36690

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2594
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-08-27 11:30

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (24H2594-01) | Matrix: Wastewater | Sampled: 2024-08-20 09:45					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2024-08-22	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-08-22	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**85.7**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**423**	1.0	mg/L	2024-08-23	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	
Alkalinity, Bicarbonate (as CaCO3)	**423**	1.0	mg/L	2024-08-23	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-08-23	
Ammonia, Total (as N)	**72.9**	0.050	mg/L	2024-08-23	
BOD, 5-day	**338**	2.0	mg/L	2024-08-26	
BOD, 5-day Carbonaceous	**385**	2.0	mg/L	2024-08-26	
Nitrogen, Total Kjeldahl	**85.7**	0.050	mg/L	2024-08-24	
pH	**7.77**	0.10	pH units	2024-08-23	HT2
Phosphorus, Total (as P)	**15.8**	0.0050	mg/L	2024-08-22	
Phosphorus, Dissolved Reactive	**9.96**	0.0050	mg/L	2024-08-22	
Solids, Total Suspended	**312**	2.0	mg/L	2024-08-23	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2594
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-08-27 11:30

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2594
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-08-27 11:30

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- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

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Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4H3451										
Blank (B4H3451-BLK1)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4H3451-BS1)				Prepared: 2024-08-21, Analyzed: 2024-08-21						
Nitrate (as N)	3.96	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.06	0.010	mg/L	2.00		103	85-115			
General Parameters, Batch B4H3444										
Blank (B4H3444-BLK1)				Prepared: 2024-08-21, Analyzed: 2024-08-26						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B4H3444-BS1)				Prepared: 2024-08-21, Analyzed: 2024-08-26						
BOD, 5-day	225	36.6	mg/L	198		114	85-115			
General Parameters, Batch B4H3447										
Blank (B4H3447-BLK1)				Prepared: 2024-08-21, Analyzed: 2024-08-26						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4H3447-BS1)				Prepared: 2024-08-21, Analyzed: 2024-08-26						
BOD, 5-day Carbonaceous	225	55.4	mg/L	198		114	85-115			
General Parameters, Batch B4H3506										
Blank (B4H3506-BLK1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4H3506-BLK2)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4H3506-BS1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	0.104	0.0050	mg/L	0.100		104	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2594
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-08-27 11:30

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4H3506, Continued										
LCS (B4H3506-BS2)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
General Parameters, Batch B4H3540										
Blank (B4H3540-BLK1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4H3540-BS1)				Prepared: 2024-08-22, Analyzed: 2024-08-22						
Phosphorus, Dissolved Reactive	0.0970	0.0050	mg/L	0.100		97	84-115			
General Parameters, Batch B4H3654										
Blank (B4H3654-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK3)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK4)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4H3654-BLK5)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4H3654-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.00	0.050	mg/L	1.00		100	85-115			
LCS (B4H3654-BS2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.05	0.050	mg/L	1.00		105	85-115			
LCS (B4H3654-BS3)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4H3654-BS4)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4H3654-BS5)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	85-115			
General Parameters, Batch B4H3672										
Blank (B4H3672-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4H3672-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Solids, Total Suspended	114	5.1	mg/L	100		114	85-115			
Duplicate (B4H3672-DUP1)		**Source: 24H2594-01**		Prepared: 2024-08-23, Analyzed: 2024-08-23						
Solids, Total Suspended	356	2.0	mg/L		312			13	20	
General Parameters, Batch B4H3711										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24H2594
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-08-27 11:30

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4H3711, Continued										
Blank (B4H3711-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4H3711-BLK2)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4H3711-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	1.01	0.050	mg/L	1.00		101	85-115			
LCS (B4H3711-BS2)				Prepared: 2024-08-23, Analyzed: 2024-08-24						
Nitrogen, Total Kjeldahl	0.961	0.050	mg/L	1.00		96	85-115			
General Parameters, Batch B4H3716										
Blank (B4H3716-BLK1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4H3716-BLK2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4H3716-BS1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	95.7	1.0	mg/L	100		96	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	38.2	1.0	mg/L	50.0		76	0-200			
LCS (B4H3716-BS3)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
Alkalinity, Total (as CaCO3)	94.8	1.0	mg/L	100		95	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	35.8	1.0	mg/L	50.0		72	0-200			
Reference (B4H3716-SRM1)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
pH	7.01	0.10	pH units	7.01		100	98-102			
Reference (B4H3716-SRM2)				Prepared: 2024-08-23, Analyzed: 2024-08-23						
pH	7.02	0.10	pH units	7.01		100	98-102			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24L0959
PO NUMBER		**RECEIVED / TEMP**	2024-12-09 11:43 / 11.9°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-16 13:15
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45635.29696

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at hhannaoui@caro.ca

Authorized By:

Hanane El Hannaoui
Junior Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0959
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-16 13:15

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (24L0959-01) | Matrix: Wastewater | Sampled: 2024-12-09 09:25					
Anions					
Chloride	**136**	0.10	mg/L	2024-12-10	
Nitrate (as N)	**2.92**	0.010	mg/L	2024-12-10	
Nitrite (as N)	**0.273**	0.010	mg/L	2024-12-10	
Calculated Parameters					
Nitrate+Nitrite (as N)	**3.20**	0.0100	mg/L	N/A	
Nitrogen, Total	**7.05**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.55**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**165**	1.0	mg/L	2024-12-09	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-12-09	
Alkalinity, Bicarbonate (as CaCO3)	**165**	1.0	mg/L	2024-12-09	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-12-09	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-12-09	
Ammonia, Total (as N)	**2.30**	0.050	mg/L	2024-12-12	
BOD, 5-day Carbonaceous	< 3.4	2.0	mg/L	2024-12-16	
Nitrogen, Total Kjeldahl	**3.85**	0.050	mg/L	2024-12-11	
pH	**7.90**	0.10	pH units	2024-12-09	HT2
Phosphorus, Total (as P)	**0.325**	0.0050	mg/L	2024-12-11	
Phosphorus, Dissolved Reactive	**0.182**	0.0050	mg/L	2024-12-10	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-12-13	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**141000**	1	MPN/100 mL	2024-12-09	
Coliforms, Fecal (Q-Tray)	**18500**	1	MPN/100 mL	2024-12-09	
Trip Blank (24L0959-02) | Matrix: Wastewater | Sampled: 2024-12-09 09:40					
Anions					
Chloride	< 0.10	0.10	mg/L	2024-12-10	
Nitrate (as N)	< 0.010	0.010	mg/L	2024-12-10	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-12-10	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2024-12-09	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-12-09	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-12-09	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-12-09	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0959
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-16 13:15

Analyte	Result	RL	Units	Analyzed	Qualifier
Trip Blank (24L0959-02) | Matrix: Wastewater | Sampled: 2024-12-09 09:40, Continued					
General Parameters, Continued					
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-12-09	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2024-12-12	
BOD, 5-day Carbonaceous	< 3.4	2.0	mg/L	2024-12-16	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2024-12-11	
pH	**6.09**	0.10	pH units	2024-12-09	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2024-12-11	
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L	2024-12-10	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-12-13	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2024-12-09	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2024-12-09	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0959
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-16 13:15

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0959
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-16 13:15

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0959
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-16 13:15

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4L2140										
Blank (B4L2140-BLK1)				Prepared: 2024-12-10, Analyzed: 2024-12-10						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4L2140-BS1)				Prepared: 2024-12-10, Analyzed: 2024-12-10						
Chloride	16.0	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	4.03	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	2.10	0.010	mg/L	2.00		105	85-115			
General Parameters, Batch B4L2160										
Blank (B4L2160-BLK1)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4L2160-BLK2)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4L2160-BS1)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
Alkalinity, Total (as CaCO3)	90.1	1.0	mg/L	100		90	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	38.6	1.0	mg/L	50.0		77	0-200			
LCS (B4L2160-BS3)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
Alkalinity, Total (as CaCO3)	90.6	1.0	mg/L	100		91	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	35.8	1.0	mg/L	50.0		72	0-200			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0959
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-16 13:15

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4L2160, Continued										
Reference (B4L2160-SRM1)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
pH	7.02	0.10	pH units	7.01		100	98-102			
Reference (B4L2160-SRM2)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
pH	7.02	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4L2231										
Blank (B4L2231-BLK1)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4L2231-BLK2)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4L2231-BS1)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Nitrogen, Total Kjeldahl	1.06	0.050	mg/L	1.00		106	85-115			
LCS (B4L2231-BS2)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Nitrogen, Total Kjeldahl	1.07	0.050	mg/L	1.00		107	85-115			
General Parameters, Batch B4L2242										
Blank (B4L2242-BLK1)				Prepared: 2024-12-10, Analyzed: 2024-12-10						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4L2242-BS1)				Prepared: 2024-12-10, Analyzed: 2024-12-10						
Phosphorus, Dissolved Reactive	0.100	0.0050	mg/L	0.100		100	84-115			
General Parameters, Batch B4L2302										
Blank (B4L2302-BLK1)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4L2302-BLK2)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4L2302-BLK3)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4L2302-BS1)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	0.101	0.0050	mg/L	0.100		101	85-115			
LCS (B4L2302-BS2)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	0.101	0.0050	mg/L	0.100		101	85-115			
LCS (B4L2302-BS3)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	0.100	0.0050	mg/L	0.100		100	85-115			
General Parameters, Batch B4L2410										
Blank (B4L2410-BLK1)				Prepared: 2024-12-11, Analyzed: 2024-12-16						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4L2410-BS1)				Prepared: 2024-12-11, Analyzed: 2024-12-16						
BOD, 5-day Carbonaceous	219	56.5	mg/L	198		111	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0959
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-16 13:15

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4L2525										
Blank (B4L2525-BLK1)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							SPK1
Blank (B4L2525-BLK2)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							SPK1
Blank (B4L2525-BLK3)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							SPK1
Blank (B4L2525-BLK4)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							SPK1
LCS (B4L2525-BS1)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	0.977	0.050	mg/L	1.00		98	85-115			
LCS (B4L2525-BS2)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	1.04	0.050	mg/L	1.00		104	85-115			
LCS (B4L2525-BS3)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	1.05	0.050	mg/L	1.00		105	85-115			
LCS (B4L2525-BS4)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	1.04	0.050	mg/L	1.00		104	85-115			
Duplicate (B4L2525-DUP2)		**Source: 24L0959-01**		Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	2.30	0.050	mg/L		2.30			< 1	15	
Matrix Spike (B4L2525-MS2)		**Source: 24L0959-01**		Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	2.41	0.050	mg/L	0.204	2.30	55	75-125			MS2
General Parameters, Batch B4L2647										
Blank (B4L2647-BLK1)				Prepared: 2024-12-13, Analyzed: 2024-12-13						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4L2647-BS1)				Prepared: 2024-12-13, Analyzed: 2024-12-13						
Solids, Total Suspended	92.5	5.0	mg/L	100		92	85-115			
Microbiological Parameters, Batch B4L2180										
Blank (B4L2180-BLK1)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4L2180-BLK2)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4L2180-BLK3)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Duplicate (B4L2180-DUP1)		**Source: 24L0959-01**		Prepared: 2024-12-09, Analyzed: 2024-12-09						
Coliforms, Fecal (Q-Tray)	23600	1	MPN/100 mL		18500			24	80	

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0959
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-16 13:15

QC Qualifiers:

MS2	The native sample concentration is greater than the spike concentration hence the matrix spike limits do not apply.
SPK1	The recovery of this analyte was outside of established control limits. The data was accepted based on performance of other batch QC.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24L0958
PO NUMBER		**RECEIVED / TEMP**	2024-12-09 11:43 / 11.9°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-16 13:21
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45635.39696

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

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If you have any questions or concerns, please contact me at hhannaoui@caro.ca

Authorized By:

Hanane El Hannaoui
Junior Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0958
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-16 13:21

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (24L0958-01) | Matrix: Water | Sampled: 2024-12-09 10:20					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2024-12-10	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-12-10	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**99.6**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**361**	1.0	mg/L	2024-12-09	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-12-09	
Alkalinity, Bicarbonate (as CaCO3)	**361**	1.0	mg/L	2024-12-09	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-12-09	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-12-09	
Ammonia, Total (as N)	**66.5**	0.050	mg/L	2024-12-12	
BOD, 5-day	**623**	2.0	mg/L	2024-12-16	
BOD, 5-day Carbonaceous	**546**	2.0	mg/L	2024-12-16	
Nitrogen, Total Kjeldahl	**99.6**	0.050	mg/L	2024-12-11	
pH	**8.24**	0.10	pH units	2024-12-09	HT2
Phosphorus, Total (as P)	**9.02**	0.0050	mg/L	2024-12-11	
Phosphorus, Dissolved Reactive	**6.28**	0.0050	mg/L	2024-12-10	
Solids, Total Suspended	**300**	2.0	mg/L	2024-12-13	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0958
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-16 13:21

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0958
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-16 13:21

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4L2140										
Blank (B4L2140-BLK1)				Prepared: 2024-12-10, Analyzed: 2024-12-10						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4L2140-BS1)				Prepared: 2024-12-10, Analyzed: 2024-12-10						
Nitrate (as N)	4.03	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	2.10	0.010	mg/L	2.00		105	85-115			
General Parameters, Batch B4L2160										
Blank (B4L2160-BLK1)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4L2160-BLK2)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4L2160-BS1)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
Alkalinity, Total (as CaCO3)	90.1	1.0	mg/L	100		90	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	38.6	1.0	mg/L	50.0		77	0-200			
LCS (B4L2160-BS3)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
Alkalinity, Total (as CaCO3)	90.6	1.0	mg/L	100		91	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	35.8	1.0	mg/L	50.0		72	0-200			
Reference (B4L2160-SRM1)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
pH	7.02	0.10	pH units	7.01		100	98-102			
Reference (B4L2160-SRM2)				Prepared: 2024-12-09, Analyzed: 2024-12-09						
pH	7.02	0.10	pH units	7.01		100	98-102			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0958
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-16 13:21

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4L2231										
Blank (B4L2231-BLK1)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4L2231-BLK2)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4L2231-BS1)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Nitrogen, Total Kjeldahl	1.06	0.050	mg/L	1.00		106	85-115			
LCS (B4L2231-BS2)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Nitrogen, Total Kjeldahl	1.07	0.050	mg/L	1.00		107	85-115			
General Parameters, Batch B4L2242										
Blank (B4L2242-BLK1)				Prepared: 2024-12-10, Analyzed: 2024-12-10						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4L2242-BS1)				Prepared: 2024-12-10, Analyzed: 2024-12-10						
Phosphorus, Dissolved Reactive	0.100	0.0050	mg/L	0.100		100	84-115			
General Parameters, Batch B4L2302										
Blank (B4L2302-BLK1)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4L2302-BLK2)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4L2302-BLK3)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4L2302-BS1)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	0.101	0.0050	mg/L	0.100		101	85-115			
LCS (B4L2302-BS2)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	0.101	0.0050	mg/L	0.100		101	85-115			
LCS (B4L2302-BS3)				Prepared: 2024-12-10, Analyzed: 2024-12-11						
Phosphorus, Total (as P)	0.100	0.0050	mg/L	0.100		100	85-115			
General Parameters, Batch B4L2410										
Blank (B4L2410-BLK1)				Prepared: 2024-12-11, Analyzed: 2024-12-16						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4L2410-BS1)				Prepared: 2024-12-11, Analyzed: 2024-12-16						
BOD, 5-day Carbonaceous	219	56.5	mg/L	198		111	85-115			
General Parameters, Batch B4L2411										
Blank (B4L2411-BLK1)				Prepared: 2024-12-11, Analyzed: 2024-12-16						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B4L2411-BS1)				Prepared: 2024-12-11, Analyzed: 2024-12-16						
BOD, 5-day	208	47.0	mg/L	198		105	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24L0958
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-16 13:21

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4L2525										
Blank (B4L2525-BLK1)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							SPK1
Blank (B4L2525-BLK2)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							SPK1
Blank (B4L2525-BLK3)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							SPK1
Blank (B4L2525-BLK4)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							SPK1
LCS (B4L2525-BS1)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	0.977	0.050	mg/L	1.00		98	85-115			
LCS (B4L2525-BS2)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	1.04	0.050	mg/L	1.00		104	85-115			
LCS (B4L2525-BS3)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	1.05	0.050	mg/L	1.00		105	85-115			
LCS (B4L2525-BS4)				Prepared: 2024-12-12, Analyzed: 2024-12-12						
Ammonia, Total (as N)	1.04	0.050	mg/L	1.00		104	85-115			
General Parameters, Batch B4L2647										
Blank (B4L2647-BLK1)				Prepared: 2024-12-13, Analyzed: 2024-12-13						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4L2647-BS1)				Prepared: 2024-12-13, Analyzed: 2024-12-13						
Solids, Total Suspended	92.5	5.0	mg/L	100		92	85-115			
Duplicate (B4L2647-DUP1)		**Source: 24L0958-01**		Prepared: 2024-12-13, Analyzed: 2024-12-13						
Solids, Total Suspended	294	2.0	mg/L		300			2	20	

QC Qualifiers:

SPK1 The recovery of this analyte was outside of established control limits. The data was accepted based on performance of other batch QC.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24B2888
PO NUMBER		**RECEIVED / TEMP**	2024-02-27 14:19 / 7.1°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45349.45435

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If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24B2888-01) | Matrix: Wastewater | Sampled: 2024-02-27 10:45					
Anions					
Chloride	**133**	0.10	mg/L	2024-03-01	
Nitrate (as N)	**3.28**	0.010	mg/L	2024-03-01	
Nitrite (as N)	**0.083**	0.010	mg/L	2024-03-01	
Phosphate (as P)	**0.0640**	0.0050	mg/L	2024-02-29	
Calculated Parameters					
Nitrate+Nitrite (as N)	**3.36**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.41**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.32**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**178**	1.0	mg/L	2024-02-29	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Alkalinity, Bicarbonate (as CaCO3)	**178**	1.0	mg/L	2024-02-29	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Ammonia, Total (as N)	**0.725**	0.050	mg/L	2024-03-02	
BOD, 5-day Carbonaceous	**5.8**	2.0	mg/L	2024-03-04	
Nitrogen, Total Kjeldahl	**2.04**	0.050	mg/L	2024-03-01	
pH	**7.41**	0.10	pH units	2024-02-29	HT2
Phosphorus, Total (as P)	**0.175**	0.0050	mg/L	2024-02-29	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-03-01	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**43500**	1	MPN/100 mL	2024-02-28	
Coliforms, Fecal (Q-Tray)	**7260**	1	MPN/100 mL	2024-02-28	
Trip Blank (24B2888-02) | Matrix: Wastewater | Sampled: 2024-02-27 10:55					
Anions					
Chloride	< 0.10	0.10	mg/L	2024-03-01	
Nitrate (as N)	< 0.010	0.010	mg/L	2024-03-01	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-03-01	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2024-02-29	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

Analyte	Result	RL	Units	Analyzed	Qualifier
Trip Blank (24B2888-02) | Matrix: Wastewater | Sampled: 2024-02-27 10:55, Continued					
General Parameters, Continued					
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2024-03-02	
BOD, 5-day Carbonaceous	< 4.5	2.0	mg/L	2024-03-04	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2024-03-01	
pH	**5.50**	0.10	pH units	2024-02-29	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2024-02-29	
Solids, Total Suspended	< 5.0	2.0	mg/L	2024-03-01	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2024-02-28	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2024-02-28	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4B3627										
Blank (B4B3627-BLK1)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Blank (B4B3627-BLK2)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4B3627-BS1)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Chloride	16.1	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	3.92	0.010	mg/L	4.00		98	90-110			
Nitrite (as N)	2.20	0.010	mg/L	2.00		110	85-115			
LCS (B4B3627-BS2)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Chloride	15.7	0.10	mg/L	16.0		98	90-110			
Nitrate (as N)	4.02	0.010	mg/L	4.00		100	90-110			
Nitrite (as N)	2.10	0.010	mg/L	2.00		105	85-115			
Anions, Batch B4B3672										
Blank (B4B3672-BLK1)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B4B3672-BS1)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Phosphate (as P)	0.102	0.0050	mg/L	0.100		102	80-120			
General Parameters, Batch B4B3614										
Blank (B4B3614-BLK1)				Prepared: 2024-02-28, Analyzed: 2024-03-04						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4B3614-BS1)				Prepared: 2024-02-28, Analyzed: 2024-03-04						
BOD, 5-day Carbonaceous	209	37.7	mg/L	198		106	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4B3622										
Blank (B4B3622-BLK1)				Prepared: 2024-02-28, Analyzed: 2024-02-29						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4B3622-BLK2)				Prepared: 2024-02-28, Analyzed: 2024-02-29						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4B3622-BS1)				Prepared: 2024-02-28, Analyzed: 2024-02-29						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
LCS (B4B3622-BS2)				Prepared: 2024-02-28, Analyzed: 2024-02-29						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
General Parameters, Batch B4B3656										
Blank (B4B3656-BLK1)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.60	0.10	pH units							HT2
Blank (B4B3656-BLK2)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.57	0.10	pH units							HT2
LCS (B4B3656-BS1)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	68.8	1.0	mg/L	50.0		138	0-200			
LCS (B4B3656-BS2)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	52.4	1.0	mg/L	50.0		105	0-200			
Reference (B4B3656-SRM1)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4B3656-SRM2)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
pH	7.03	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4B3687										
Blank (B4B3687-BLK1)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4B3687-BS1)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Solids, Total Suspended	92.1	9.9	mg/L	100		92	85-115			
General Parameters, Batch B4B3704										
Blank (B4B3704-BLK1)				Prepared: 2024-02-29, Analyzed: 2024-03-01						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4B3704, Continued										
Blank (B4B3704-BLK2)				Prepared: 2024-02-29, Analyzed: 2024-03-01						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4B3704-BS1)				Prepared: 2024-02-29, Analyzed: 2024-03-01						
Nitrogen, Total Kjeldahl	0.968	0.050	mg/L	1.00		97	85-115			
LCS (B4B3704-BS2)				Prepared: 2024-02-29, Analyzed: 2024-03-01						
Nitrogen, Total Kjeldahl	0.969	0.050	mg/L	1.00		97	85-115			
General Parameters, Batch B4C1367										
Blank (B4C1367-BLK1)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4C1367-BLK2)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4C1367-BLK3)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4C1367-BLK4)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4C1367-BS1)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	1.03	0.050	mg/L	1.00		103	85-115			
LCS (B4C1367-BS2)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	1.04	0.050	mg/L	1.00		104	85-115			
LCS (B4C1367-BS3)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	1.05	0.050	mg/L	1.00		105	85-115			
LCS (B4C1367-BS4)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	1.05	0.050	mg/L	1.00		105	85-115			
Duplicate (B4C1367-DUP3)		**Source: 24B2888-01**		Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	0.722	0.050	mg/L		0.725			< 1	15	
Matrix Spike (B4C1367-MS3)		**Source: 24B2888-01**		Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	0.967	0.050	mg/L	0.204	0.725	119	75-125			
Microbiological Parameters, Batch B4B3539										
Blank (B4B3539-BLK1)				Prepared: 2024-02-28, Analyzed: 2024-02-28						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4B3539-BLK2)				Prepared: 2024-02-28, Analyzed: 2024-02-28						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4B3539-BLK3)				Prepared: 2024-02-28, Analyzed: 2024-02-28						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							

QC Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24B2888
PO NUMBER		**RECEIVED / TEMP**	2024-02-27 14:19 / 7.1°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45349.45435

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24B2888-01) | Matrix: Wastewater | Sampled: 2024-02-27 10:45					
Anions					
Chloride	**133**	0.10	mg/L	2024-03-01	
Nitrate (as N)	**3.28**	0.010	mg/L	2024-03-01	
Nitrite (as N)	**0.083**	0.010	mg/L	2024-03-01	
Phosphate (as P)	**0.0640**	0.0050	mg/L	2024-02-29	
Calculated Parameters					
Nitrate+Nitrite (as N)	**3.36**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.41**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.32**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**178**	1.0	mg/L	2024-02-29	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Alkalinity, Bicarbonate (as CaCO3)	**178**	1.0	mg/L	2024-02-29	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Ammonia, Total (as N)	**0.725**	0.050	mg/L	2024-03-02	
BOD, 5-day Carbonaceous	**5.8**	2.0	mg/L	2024-03-04	
Nitrogen, Total Kjeldahl	**2.04**	0.050	mg/L	2024-03-01	
pH	**7.41**	0.10	pH units	2024-02-29	HT2
Phosphorus, Total (as P)	**0.175**	0.0050	mg/L	2024-02-29	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-03-01	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**43500**	1	MPN/100 mL	2024-02-28	
Coliforms, Fecal (Q-Tray)	**7260**	1	MPN/100 mL	2024-02-28	
Trip Blank (24B2888-02) | Matrix: Wastewater | Sampled: 2024-02-27 10:55					
Anions					
Chloride	< 0.10	0.10	mg/L	2024-03-01	
Nitrate (as N)	< 0.010	0.010	mg/L	2024-03-01	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-03-01	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2024-02-29	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

Analyte	Result	RL	Units	Analyzed	Qualifier
Trip Blank (24B2888-02) | Matrix: Wastewater | Sampled: 2024-02-27 10:55, Continued					
General Parameters, Continued					
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-02-29	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2024-03-02	
BOD, 5-day Carbonaceous	< 4.5	2.0	mg/L	2024-03-04	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2024-03-01	
pH	**5.50**	0.10	pH units	2024-02-29	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2024-02-29	
Solids, Total Suspended	< 5.0	2.0	mg/L	2024-03-01	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2024-02-28	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2024-02-28	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4B3627										
Blank (B4B3627-BLK1)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Blank (B4B3627-BLK2)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4B3627-BS1)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Chloride	16.1	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	3.92	0.010	mg/L	4.00		98	90-110			
Nitrite (as N)	2.20	0.010	mg/L	2.00		110	85-115			
LCS (B4B3627-BS2)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Chloride	15.7	0.10	mg/L	16.0		98	90-110			
Nitrate (as N)	4.02	0.010	mg/L	4.00		100	90-110			
Nitrite (as N)	2.10	0.010	mg/L	2.00		105	85-115			
Anions, Batch B4B3672										
Blank (B4B3672-BLK1)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B4B3672-BS1)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Phosphate (as P)	0.102	0.0050	mg/L	0.100		102	80-120			
General Parameters, Batch B4B3614										
Blank (B4B3614-BLK1)				Prepared: 2024-02-28, Analyzed: 2024-03-04						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4B3614-BS1)				Prepared: 2024-02-28, Analyzed: 2024-03-04						
BOD, 5-day Carbonaceous	209	37.7	mg/L	198		106	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4B3622										
Blank (B4B3622-BLK1)				Prepared: 2024-02-28, Analyzed: 2024-02-29						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4B3622-BLK2)				Prepared: 2024-02-28, Analyzed: 2024-02-29						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4B3622-BS1)				Prepared: 2024-02-28, Analyzed: 2024-02-29						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
LCS (B4B3622-BS2)				Prepared: 2024-02-28, Analyzed: 2024-02-29						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
General Parameters, Batch B4B3656										
Blank (B4B3656-BLK1)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.60	0.10	pH units							HT2
Blank (B4B3656-BLK2)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.57	0.10	pH units							HT2
LCS (B4B3656-BS1)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	68.8	1.0	mg/L	50.0		138	0-200			
LCS (B4B3656-BS2)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	52.4	1.0	mg/L	50.0		105	0-200			
Reference (B4B3656-SRM1)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4B3656-SRM2)				Prepared: 2024-02-29, Analyzed: 2024-02-29						
pH	7.03	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4B3687										
Blank (B4B3687-BLK1)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4B3687-BS1)				Prepared: 2024-03-01, Analyzed: 2024-03-01						
Solids, Total Suspended	92.1	9.9	mg/L	100		92	85-115			
General Parameters, Batch B4B3704										
Blank (B4B3704-BLK1)				Prepared: 2024-02-29, Analyzed: 2024-03-01						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24B2888
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-04 13:33

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4B3704, Continued										
Blank (B4B3704-BLK2)				Prepared: 2024-02-29, Analyzed: 2024-03-01						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4B3704-BS1)				Prepared: 2024-02-29, Analyzed: 2024-03-01						
Nitrogen, Total Kjeldahl	0.968	0.050	mg/L	1.00		97	85-115			
LCS (B4B3704-BS2)				Prepared: 2024-02-29, Analyzed: 2024-03-01						
Nitrogen, Total Kjeldahl	0.969	0.050	mg/L	1.00		97	85-115			
General Parameters, Batch B4C1367										
Blank (B4C1367-BLK1)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4C1367-BLK2)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4C1367-BLK3)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4C1367-BLK4)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4C1367-BS1)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	1.03	0.050	mg/L	1.00		103	85-115			
LCS (B4C1367-BS2)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	1.04	0.050	mg/L	1.00		104	85-115			
LCS (B4C1367-BS3)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	1.05	0.050	mg/L	1.00		105	85-115			
LCS (B4C1367-BS4)				Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	1.05	0.050	mg/L	1.00		105	85-115			
Duplicate (B4C1367-DUP3)		**Source: 24B2888-01**		Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	0.722	0.050	mg/L		0.725			< 1	15	
Matrix Spike (B4C1367-MS3)		**Source: 24B2888-01**		Prepared: 2024-03-02, Analyzed: 2024-03-02						
Ammonia, Total (as N)	0.967	0.050	mg/L	0.204	0.725	119	75-125			
Microbiological Parameters, Batch B4B3539										
Blank (B4B3539-BLK1)				Prepared: 2024-02-28, Analyzed: 2024-02-28						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4B3539-BLK2)				Prepared: 2024-02-28, Analyzed: 2024-02-28						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4B3539-BLK3)				Prepared: 2024-02-28, Analyzed: 2024-02-28						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							

QC Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24A0602
PO NUMBER		**RECEIVED / TEMP**	2024-01-08 11:04 / 11.8°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-01-15 12:29
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45299.33778

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24A0602
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-01-15 12:29

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24A0602-01) | Matrix: Wastewater | Sampled: 2024-01-08 09:55					
Anions					
Chloride	**115**	0.10	mg/L	2024-01-10	
Nitrate (as N)	**2.41**	0.010	mg/L	2024-01-10	
Nitrite (as N)	**0.280**	0.010	mg/L	2024-01-10	
Phosphate (as P)	**0.0750**	0.0050	mg/L	2024-01-10	
Calculated Parameters					
Nitrate+Nitrite (as N)	**2.69**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.80**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.58**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**188**	1.0	mg/L	2024-01-09	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-01-09	
Alkalinity, Bicarbonate (as CaCO3)	**188**	1.0	mg/L	2024-01-09	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-01-09	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-01-09	
Ammonia, Total (as N)	**1.53**	0.050	mg/L	2024-01-10	
BOD, 5-day Carbonaceous	**4.0**	2.0	mg/L	2024-01-15	
Nitrogen, Total Kjeldahl	**3.11**	0.050	mg/L	2024-01-11	
pH	**7.62**	0.10	pH units	2024-01-09	HT2
Phosphorus, Total (as P)	**0.261**	0.0050	mg/L	2024-01-10	
Solids, Total Suspended	< 3.3	2.0	mg/L	2024-01-09	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**242000**	1	MPN/100 mL	2024-01-09	
Coliforms, Fecal (Q-Tray)	**15200**	1	MPN/100 mL	2024-01-09	
Field Blank (24A0602-02) | Matrix: Wastewater | Sampled: 2024-01-08 10:15					
Anions					
Chloride	< 0.10	0.10	mg/L	2024-01-10	
Nitrate (as N)	< 0.010	0.010	mg/L	2024-01-10	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-01-10	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2024-01-10	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2024-01-09	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-01-09	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-01-09	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24A0602
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-01-15 12:29

Analyte	Result	RL	Units	Analyzed	Qualifier
Field Blank (24A0602-02) | Matrix: Wastewater | Sampled: 2024-01-08 10:15, Continued					
General Parameters, Continued					
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-01-09	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-01-09	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2024-01-10	
BOD, 5-day Carbonaceous	< 2.4	2.0	mg/L	2024-01-15	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2024-01-11	
pH	**5.85**	0.10	pH units	2024-01-09	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2024-01-10	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-01-09	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2024-01-09	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2024-01-09	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24A0602
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-01-15 12:29

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24A0602
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-01-15 12:29

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- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
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Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4A1754										
Blank (B4A1754-BLK1)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4A1754-BS1)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Chloride	15.9	0.10	mg/L	16.0		99	90-110			
Nitrate (as N)	3.96	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.07	0.010	mg/L	2.00		103	85-115			
Anions, Batch B4A1760										
Blank (B4A1760-BLK1)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B4A1760-BS1)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Phosphate (as P)	0.100	0.0050	mg/L	0.100		100	80-120			
General Parameters, Batch B4A1712										
Blank (B4A1712-BLK1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4A1712-BS1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Alkalinity, Total (as CaCO3)	106	1.0	mg/L	100		106	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	14.9	1.0	mg/L	50.0		30	0-200			
Reference (B4A1712-SRM1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
pH	7.04	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4A1725										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24A0602
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-01-15 12:29

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4A1725, Continued										
Blank (B4A1725-BLK1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4A1725-BS1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Solids, Total Suspended	112	20.0	mg/L	100		112	85-115			
General Parameters, Batch B4A1805										
Blank (B4A1805-BLK1)				Prepared: 2024-01-09, Analyzed: 2024-01-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4A1805-BLK3)				Prepared: 2024-01-09, Analyzed: 2024-01-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4A1805-BS1)				Prepared: 2024-01-09, Analyzed: 2024-01-10						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
LCS (B4A1805-BS3)				Prepared: 2024-01-09, Analyzed: 2024-01-10						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
General Parameters, Batch B4A1825										
Blank (B4A1825-BLK1)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4A1825-BLK2)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4A1825-BS1)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Ammonia, Total (as N)	1.04	0.050	mg/L	1.00		104	85-115			
LCS (B4A1825-BS2)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Ammonia, Total (as N)	1.03	0.050	mg/L	1.00		103	85-115			
General Parameters, Batch B4A1891										
Blank (B4A1891-BLK1)				Prepared: 2024-01-10, Analyzed: 2024-01-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4A1891-BLK2)				Prepared: 2024-01-10, Analyzed: 2024-01-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4A1891-BS1)				Prepared: 2024-01-10, Analyzed: 2024-01-11						
Nitrogen, Total Kjeldahl	0.944	0.050	mg/L	1.00		94	85-115			
LCS (B4A1891-BS2)				Prepared: 2024-01-10, Analyzed: 2024-01-11						
Nitrogen, Total Kjeldahl	0.976	0.050	mg/L	1.00		98	85-115			
General Parameters, Batch B4A1917										
Blank (B4A1917-BLK1)				Prepared: 2024-01-10, Analyzed: 2024-01-15						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4A1917-BS1)				Prepared: 2024-01-10, Analyzed: 2024-01-15						
BOD, 5-day Carbonaceous	192	40.0	mg/L	198		97	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24A0602
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-01-15 12:29

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Microbiological Parameters, Batch B4A1740										
Blank (B4A1740-BLK1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4A1740-BLK2)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4A1740-BLK3)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Duplicate (B4A1740-DUP1)		**Source: 24A0602-01**		Prepared: 2024-01-09, Analyzed: 2024-01-09						
Coliforms, Fecal (Q-Tray)	19300	1	MPN/100 mL		15200			23	80	

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24A0601
PO NUMBER		**RECEIVED / TEMP**	2024-01-08 11:04 / 11.8°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-01-15 12:30
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45299.33778

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24A0601
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-01-15 12:30

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (24A0601-01) | Matrix: Wastewater | Sampled: 2024-01-08 10:20					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2024-01-10	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-01-10	
Phosphate (as P)	**5.54**	0.0050	mg/L	2024-01-10	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**80.0**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**352**	1.0	mg/L	2024-01-09	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-01-09	
Alkalinity, Bicarbonate (as CaCO3)	**352**	1.0	mg/L	2024-01-09	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-01-09	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-01-09	
Ammonia, Total (as N)	**59.4**	0.050	mg/L	2024-01-09	
BOD, 5-day	**348**	2.0	mg/L	2024-01-15	
BOD, 5-day Carbonaceous	**297**	2.0	mg/L	2024-01-15	
Nitrogen, Total Kjeldahl	**80.0**	0.050	mg/L	2024-01-11	
pH	**8.07**	0.10	pH units	2024-01-09	HT2
Phosphorus, Total (as P)	**10.0**	0.0050	mg/L	2024-01-10	
Solids, Total Suspended	**236**	2.0	mg/L	2024-01-09	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24A0601
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-01-15 12:30

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline(s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24A0601
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-01-15 12:30

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4A1754										
Blank (B4A1754-BLK1)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4A1754-BS1)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Nitrate (as N)	3.96	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.07	0.010	mg/L	2.00		103	85-115			
Anions, Batch B4A1760										
Blank (B4A1760-BLK1)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B4A1760-BS1)				Prepared: 2024-01-10, Analyzed: 2024-01-10						
Phosphate (as P)	0.100	0.0050	mg/L	0.100		100	80-120			
General Parameters, Batch B4A1695										
Blank (B4A1695-BLK1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Ammonia, Total (as N)	0.010	0.010	mg/L							
Blank (B4A1695-BLK2)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Ammonia, Total (as N)	< 0.010	0.010	mg/L							
LCS (B4A1695-BS1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Ammonia, Total (as N)	1.02	0.010	mg/L	1.00		102	85-115			
LCS (B4A1695-BS2)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Ammonia, Total (as N)	1.03	0.010	mg/L	1.00		103	85-115			
General Parameters, Batch B4A1712										
Blank (B4A1712-BLK1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24A0601
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-01-15 12:30

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4A1712, Continued										
Blank (B4A1712-BLK1), Continued				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4A1712-BS1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Alkalinity, Total (as CaCO3)	106	1.0	mg/L	100		106	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	14.9	1.0	mg/L	50.0		30	0-200			
Reference (B4A1712-SRM1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
pH	7.04	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4A1725										
Blank (B4A1725-BLK1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4A1725-BS1)				Prepared: 2024-01-09, Analyzed: 2024-01-09						
Solids, Total Suspended	112	20.0	mg/L	100		112	85-115			
General Parameters, Batch B4A1805										
Blank (B4A1805-BLK1)				Prepared: 2024-01-09, Analyzed: 2024-01-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4A1805-BLK3)				Prepared: 2024-01-09, Analyzed: 2024-01-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4A1805-BS1)				Prepared: 2024-01-09, Analyzed: 2024-01-10						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
LCS (B4A1805-BS3)				Prepared: 2024-01-09, Analyzed: 2024-01-10						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
General Parameters, Batch B4A1891										
Blank (B4A1891-BLK1)				Prepared: 2024-01-10, Analyzed: 2024-01-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4A1891-BLK2)				Prepared: 2024-01-10, Analyzed: 2024-01-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4A1891-BS1)				Prepared: 2024-01-10, Analyzed: 2024-01-11						
Nitrogen, Total Kjeldahl	0.944	0.050	mg/L	1.00		94	85-115			
LCS (B4A1891-BS2)				Prepared: 2024-01-10, Analyzed: 2024-01-11						
Nitrogen, Total Kjeldahl	0.976	0.050	mg/L	1.00		98	85-115			
General Parameters, Batch B4A1917										
Blank (B4A1917-BLK1)				Prepared: 2024-01-10, Analyzed: 2024-01-15						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4A1917-BS1)				Prepared: 2024-01-10, Analyzed: 2024-01-15						
BOD, 5-day Carbonaceous	192	40.0	mg/L	198		97	85-115			
General Parameters, Batch B4A1919										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24A0601
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-01-15 12:30

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4A1919, Continued										
Blank (B4A1919-BLK1)				Prepared: 2024-01-10, Analyzed: 2024-01-15						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B4A1919-BS1)				Prepared: 2024-01-10, Analyzed: 2024-01-15						
BOD, 5-day	175	51.6	mg/L	198		88	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24G0890
PO NUMBER		**RECEIVED / TEMP**	2024-07-08 11:33 / 16.6°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-07-15 12:59
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45481.31193

Introduction:

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Big Picture Sidekicks

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It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

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If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24G0890
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-07-15 12:59

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24G0890-01) | Matrix: Wastewater | Sampled: 2024-07-08 07:40					
Anions					
Chloride	**128**	0.10	mg/L	2024-07-10	
Nitrate (as N)	**2.27**	0.010	mg/L	2024-07-10	
Nitrite (as N)	**0.732**	0.010	mg/L	2024-07-10	
Calculated Parameters					
Nitrate+Nitrite (as N)	**3.01**	0.0100	mg/L	N/A	
Nitrogen, Total	**6.29**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.84**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**170**	1.0	mg/L	2024-07-08	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-07-08	
Alkalinity, Bicarbonate (as CaCO3)	**170**	1.0	mg/L	2024-07-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-07-08	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-07-08	
Ammonia, Total (as N)	**1.44**	0.050	mg/L	2024-07-10	
BOD, 5-day Carbonaceous	< 3.2	2.0	mg/L	2024-07-15	
Nitrogen, Total Kjeldahl	**3.28**	0.050	mg/L	2024-07-12	
pH	**7.48**	0.10	pH units	2024-07-08	HT2
Phosphorus, Total (as P)	**0.368**	0.0050	mg/L	2024-07-11	
Phosphorus, Dissolved Reactive	**0.230**	0.0050	mg/L	2024-07-10	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-07-13	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**155000**	1	MPN/100 mL	2024-07-09	
Coliforms, Fecal (Q-Tray)	**19700**	1	MPN/100 mL	2024-07-09	
Trip Blank (24G0890-02) | Matrix: Wastewater | Sampled: 2024-07-08 09:30					
Anions					
Chloride	< 0.10	0.10	mg/L	2024-07-10	
Nitrate (as N)	< 0.010	0.010	mg/L	2024-07-10	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-07-10	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2024-07-08	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-07-08	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-07-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-07-08	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24G0890
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-07-15 12:59

Analyte	Result	RL	Units	Analyzed	Qualifier
Trip Blank (24G0890-02) | Matrix: Wastewater | Sampled: 2024-07-08 09:30, Continued					
General Parameters, Continued					
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-07-08	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2024-07-10	
BOD, 5-day Carbonaceous	< 6.4	2.0	mg/L	2024-07-15	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2024-07-12	
pH	**6.29**	0.10	pH units	2024-07-08	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2024-07-11	
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L	2024-07-10	
Solids, Total Suspended	< 4.0	2.0	mg/L	2024-07-13	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2024-07-09	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2024-07-09	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24G0890
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-07-15 12:59

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24G0890
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-07-15 12:59

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4G2472										
Blank (B4G2472-BLK1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Blank (B4G2472-BLK2)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4G2472-BS1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Chloride	16.2	0.10	mg/L	16.0		101	90-110			
Nitrate (as N)	3.94	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.04	0.010	mg/L	2.00		102	85-115			
LCS (B4G2472-BS2)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Chloride	16.1	0.10	mg/L	16.0		101	90-110			
Nitrate (as N)	3.94	0.010	mg/L	4.00		98	90-110			
Nitrite (as N)	2.21	0.010	mg/L	2.00		110	85-115			
General Parameters, Batch B4G2266										
Blank (B4G2266-BLK1)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4G2266-BLK2)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24G0890
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-07-15 12:59

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4G2266, Continued										
LCS (B4G2266-BS1)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
Alkalinity, Total (as CaCO3)	96.4	1.0	mg/L	100		96	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	75.4	1.0	mg/L	50.0		151	0-200			
LCS (B4G2266-BS3)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
Alkalinity, Total (as CaCO3)	95.9	1.0	mg/L	100		96	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	75.8	1.0	mg/L	50.0		152	0-200			
Reference (B4G2266-SRM1)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4G2266-SRM2)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
pH	7.02	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4G2427										
Blank (B4G2427-BLK1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4G2427-BS1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Phosphorus, Dissolved Reactive	0.0990	0.0050	mg/L	0.100		99	84-115			
Duplicate (B4G2427-DUP1)			**Source: 24G0890-01**	Prepared: 2024-07-10, Analyzed: 2024-07-10						
Phosphorus, Dissolved Reactive	0.230	0.0050	mg/L		0.230			< 1	14	
Matrix Spike (B4G2427-MS1)			**Source: 24G0890-01**	Prepared: 2024-07-10, Analyzed: 2024-07-10						
Phosphorus, Dissolved Reactive	0.300	0.0050	mg/L	0.100	0.230	70	70-130			MS2
General Parameters, Batch B4G2430										
Blank (B4G2430-BLK1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4G2430-BLK2)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4G2430-BS1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Ammonia, Total (as N)	0.936	0.050	mg/L	1.00		94	85-115			
LCS (B4G2430-BS2)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Ammonia, Total (as N)	0.904	0.050	mg/L	1.00		90	85-115			
Duplicate (B4G2430-DUP1)			**Source: 24G0890-01**	Prepared: 2024-07-10, Analyzed: 2024-07-10						
Ammonia, Total (as N)	1.41	0.050	mg/L		1.44			2	15	
Matrix Spike (B4G2430-MS1)			**Source: 24G0890-01**	Prepared: 2024-07-10, Analyzed: 2024-07-10						
Ammonia, Total (as N)	1.56	0.050	mg/L	0.204	1.44	60	75-125			MS2
General Parameters, Batch B4G2529										
Blank (B4G2529-BLK1)				Prepared: 2024-07-10, Analyzed: 2024-07-15						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4G2529-BS1)				Prepared: 2024-07-10, Analyzed: 2024-07-15						
BOD, 5-day Carbonaceous	202	2.0	mg/L	198		102	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24G0890
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-07-15 12:59

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4G2598										
Blank (B4G2598-BLK1)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4G2598-BLK2)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4G2598-BS1)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
LCS (B4G2598-BS2)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
General Parameters, Batch B4G2656										
Blank (B4G2656-BLK1)				Prepared: 2024-07-11, Analyzed: 2024-07-12						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4G2656-BLK2)				Prepared: 2024-07-11, Analyzed: 2024-07-12						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4G2656-BS1)				Prepared: 2024-07-11, Analyzed: 2024-07-12						
Nitrogen, Total Kjeldahl	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4G2656-BS2)				Prepared: 2024-07-11, Analyzed: 2024-07-12						
Nitrogen, Total Kjeldahl	1.02	0.050	mg/L	1.00		102	85-115			
General Parameters, Batch B4G2879										
Blank (B4G2879-BLK1)				Prepared: 2024-07-13, Analyzed: 2024-07-13						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4G2879-BS1)				Prepared: 2024-07-13, Analyzed: 2024-07-13						
Solids, Total Suspended	92.9	10.2	mg/L	100		93	85-115			
Microbiological Parameters, Batch B4G2326										
Blank (B4G2326-BLK1)				Prepared: 2024-07-09, Analyzed: 2024-07-09						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4G2326-BLK2)				Prepared: 2024-07-09, Analyzed: 2024-07-09						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4G2326-BLK3)				Prepared: 2024-07-09, Analyzed: 2024-07-09						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4G2326-BLK4)				Prepared: 2024-07-09, Analyzed: 2024-07-09						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Duplicate (B4G2326-DUP1)		**Source: 24G0890-01**		Prepared: 2024-07-09, Analyzed: 2024-07-09						
Coliforms, Fecal (Q-Tray)	19500	1	MPN/100 mL		19700			1	80	

QC Qualifiers:

MS2 The native sample concentration is greater than the spike concentration hence the matrix spike limits do not apply.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24G0889
PO NUMBER		**RECEIVED / TEMP**	2024-07-08 11:33 / 16.6°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-07-15 12:44
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45481.31193

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24G0889
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-07-15 12:44

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (24G0889-01) | Matrix: Wastewater | Sampled: 2024-07-08 11:03					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2024-07-10	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-07-10	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**107**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**391**	1.0	mg/L	2024-07-08	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-07-08	
Alkalinity, Bicarbonate (as CaCO3)	**391**	1.0	mg/L	2024-07-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-07-08	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-07-08	
Ammonia, Total (as N)	**65.0**	0.050	mg/L	2024-07-10	
BOD, 5-day	**616**	2.0	mg/L	2024-07-15	
BOD, 5-day Carbonaceous	**494**	2.0	mg/L	2024-07-15	
Nitrogen, Total Kjeldahl	**107**	0.050	mg/L	2024-07-12	
pH	**7.96**	0.10	pH units	2024-07-08	HT2
Phosphorus, Total (as P)	**13.3**	0.0050	mg/L	2024-07-11	
Phosphorus, Dissolved Reactive	**6.40**	0.0050	mg/L	2024-07-10	
Solids, Total Suspended	**428**	2.0	mg/L	2024-07-11	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24G0889
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-07-15 12:44

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24G0889
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-07-15 12:44

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- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4G2472										
Blank (B4G2472-BLK1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Blank (B4G2472-BLK2)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4G2472-BS1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Nitrate (as N)	3.94	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.04	0.010	mg/L	2.00		102	85-115			
LCS (B4G2472-BS2)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Nitrate (as N)	3.94	0.010	mg/L	4.00		98	90-110			
Nitrite (as N)	2.21	0.010	mg/L	2.00		110	85-115			
General Parameters, Batch B4G2266										
Blank (B4G2266-BLK1)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4G2266-BLK2)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4G2266-BS1)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
Alkalinity, Total (as CaCO3)	96.4	1.0	mg/L	100		96	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	75.4	1.0	mg/L	50.0		151	0-200			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24G0889
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-07-15 12:44

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4G2266, Continued										
LCS (B4G2266-BS3)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
Alkalinity, Total (as CaCO3)	95.9	1.0	mg/L	100		96	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	75.8	1.0	mg/L	50.0		152	0-200			
Reference (B4G2266-SRM1)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4G2266-SRM2)				Prepared: 2024-07-08, Analyzed: 2024-07-08						
pH	7.02	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4G2427										
Blank (B4G2427-BLK1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4G2427-BS1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Phosphorus, Dissolved Reactive	0.0990	0.0050	mg/L	0.100		99	84-115			
General Parameters, Batch B4G2430										
Blank (B4G2430-BLK1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4G2430-BLK2)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4G2430-BS1)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Ammonia, Total (as N)	0.936	0.050	mg/L	1.00		94	85-115			
LCS (B4G2430-BS2)				Prepared: 2024-07-10, Analyzed: 2024-07-10						
Ammonia, Total (as N)	0.904	0.050	mg/L	1.00		90	85-115			
General Parameters, Batch B4G2475										
Blank (B4G2475-BLK1)				Prepared: 2024-07-10, Analyzed: 2024-07-11						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4G2475-BS1)				Prepared: 2024-07-10, Analyzed: 2024-07-11						
Solids, Total Suspended	94.0	10.0	mg/L	100		94	85-115			
Duplicate (B4G2475-DUP1)		**Source: 24G0889-01**		Prepared: 2024-07-10, Analyzed: 2024-07-11						
Solids, Total Suspended	416	2.0	mg/L		428			3	20	
General Parameters, Batch B4G2529										
Blank (B4G2529-BLK1)				Prepared: 2024-07-10, Analyzed: 2024-07-15						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4G2529-BS1)				Prepared: 2024-07-10, Analyzed: 2024-07-15						
BOD, 5-day Carbonaceous	202	2.0	mg/L	198		102	85-115			
General Parameters, Batch B4G2530										
Blank (B4G2530-BLK1)				Prepared: 2024-07-10, Analyzed: 2024-07-15						
BOD, 5-day	< 2.0	2.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24G0889
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-07-15 12:44

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4G2530, Continued										
LCS (B4G2530-BS1)				Prepared: 2024-07-10, Analyzed: 2024-07-15						
BOD, 5-day	213	2.0	mg/L	198		108	85-115			
General Parameters, Batch B4G2598										
Blank (B4G2598-BLK1)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4G2598-BLK2)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4G2598-BS1)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
LCS (B4G2598-BS2)				Prepared: 2024-07-11, Analyzed: 2024-07-11						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
General Parameters, Batch B4G2656										
Blank (B4G2656-BLK1)				Prepared: 2024-07-11, Analyzed: 2024-07-12						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4G2656-BLK2)				Prepared: 2024-07-11, Analyzed: 2024-07-12						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4G2656-BS1)				Prepared: 2024-07-11, Analyzed: 2024-07-12						
Nitrogen, Total Kjeldahl	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4G2656-BS2)				Prepared: 2024-07-11, Analyzed: 2024-07-12						
Nitrogen, Total Kjeldahl	1.02	0.050	mg/L	1.00		102	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24F1657
PO NUMBER		**RECEIVED / TEMP**	2024-06-13 10:34 / 18.1°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-06-20 09:06
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45456.30373

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1657
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-06-20 09:06

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24F1657-01) | Matrix: Wastewater | Sampled: 2024-06-13 07:30					
Anions					
Chloride	**135**	0.10	mg/L	2024-06-14	
Nitrate (as N)	**2.10**	0.010	mg/L	2024-06-14	
Nitrite (as N)	**0.329**	0.010	mg/L	2024-06-14	
Calculated Parameters					
Nitrate+Nitrite (as N)	**2.43**	0.0100	mg/L	N/A	
Nitrogen, Total	**6.05**	0.0500	mg/L	N/A	
Nitrogen, Organic	**0.904**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**168**	1.0	mg/L	2024-06-18	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-06-18	
Alkalinity, Bicarbonate (as CaCO3)	**168**	1.0	mg/L	2024-06-18	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-06-18	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-06-18	
Ammonia, Total (as N)	**2.72**	0.050	mg/L	2024-06-14	
BOD, 5-day Carbonaceous	**4.6**	2.0	mg/L	2024-06-19	
Nitrogen, Total Kjeldahl	**3.62**	0.050	mg/L	2024-06-18	
pH	**7.73**	0.10	pH units	2024-06-18	HT2
Phosphorus, Total (as P)	**0.289**	0.0050	mg/L	2024-06-14	
Phosphorus, Dissolved Reactive	**0.0840**	0.0050	mg/L	2024-06-13	
Solids, Total Suspended	**2.2**	2.0	mg/L	2024-06-18	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**> 242000**	1	MPN/100 mL	2024-06-13	
Coliforms, Fecal (Q-Tray)	**81600**	1	MPN/100 mL	2024-06-13	
Duplicate (24F1657-02) | Matrix: Wastewater | Sampled: 2024-06-13 07:30					
Anions					
Chloride	**146**	0.10	mg/L	2024-06-14	
Nitrate (as N)	**2.08**	0.010	mg/L	2024-06-14	
Nitrite (as N)	**0.330**	0.010	mg/L	2024-06-14	
Calculated Parameters					
Nitrate+Nitrite (as N)	**2.41**	0.0100	mg/L	N/A	
Nitrogen, Total	**6.02**	0.0500	mg/L	N/A	
Nitrogen, Organic	**0.869**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**169**	1.0	mg/L	2024-06-18	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-06-18	
Alkalinity, Bicarbonate (as CaCO3)	**169**	1.0	mg/L	2024-06-18	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-06-18	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1657
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-06-20 09:06

Analyte	Result	RL	Units	Analyzed	Qualifier
Duplicate (24F1657-02) | Matrix: Wastewater | Sampled: 2024-06-13 07:30, Continued					
General Parameters, Continued					
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-06-18	
Ammonia, Total (as N)	**2.74**	0.050	mg/L	2024-06-14	
BOD, 5-day Carbonaceous	**5.2**	2.0	mg/L	2024-06-19	
Nitrogen, Total Kjeldahl	**3.61**	0.050	mg/L	2024-06-18	
pH	**7.47**	0.10	pH units	2024-06-18	HT2
Phosphorus, Total (as P)	**0.294**	0.0050	mg/L	2024-06-14	
Phosphorus, Dissolved Reactive	**0.0820**	0.0050	mg/L	2024-06-13	
Solids, Total Suspended	**3.8**	2.0	mg/L	2024-06-18	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**> 242000**	1	MPN/100 mL	2024-06-13	
Coliforms, Fecal (Q-Tray)	**155000**	1	MPN/100 mL	2024-06-13	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1657
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-06-20 09:06

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
>	Greater than the specified Result
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1657
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-06-20 09:06

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1657
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-06-20 09:06

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4F2739										
Blank (B4F2739-BLK1)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Blank (B4F2739-BLK2)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4F2739-BS1)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Chloride	16.4	0.10	mg/L	16.0		103	90-110			
Nitrate (as N)	3.99	0.010	mg/L	4.00		100	90-110			
Nitrite (as N)	1.98	0.010	mg/L	2.00		99	85-115			
LCS (B4F2739-BS2)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Chloride	15.8	0.10	mg/L	16.0		99	90-110			
Nitrate (as N)	3.98	0.010	mg/L	4.00		100	90-110			
Nitrite (as N)	2.02	0.010	mg/L	2.00		101	85-115			
General Parameters, Batch B4F2874										
Blank (B4F2874-BLK1)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4F2874-BS1)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Phosphorus, Dissolved Reactive	0.100	0.0050	mg/L	0.100		100	84-115			
General Parameters, Batch B4F2878										
Blank (B4F2878-BLK1)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4F2878-BLK2)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1657
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-06-20 09:06

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4F2878, Continued										
Blank (B4F2878-BLK3)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4F2878-BLK4)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4F2878-BLK5)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4F2878-BS1)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	0.990	0.050	mg/L	1.00		99	85-115			
LCS (B4F2878-BS2)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	1.00	0.050	mg/L	1.00		100	85-115			
LCS (B4F2878-BS3)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	1.03	0.050	mg/L	1.00		103	85-115			
LCS (B4F2878-BS4)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4F2878-BS5)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	85-115			
General Parameters, Batch B4F2885										
Blank (B4F2885-BLK1)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4F2885-BLK2)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4F2885-BLK3)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4F2885-BS1)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
LCS (B4F2885-BS2)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
LCS (B4F2885-BS3)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	0.100	0.0050	mg/L	0.100		100	85-115			
General Parameters, Batch B4F2978										
Blank (B4F2978-BLK1)				Prepared: 2024-06-14, Analyzed: 2024-06-19						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4F2978-BS1)				Prepared: 2024-06-14, Analyzed: 2024-06-19						
BOD, 5-day Carbonaceous	183	41.3	mg/L	198		93	85-115			
General Parameters, Batch B4F3141										
Blank (B4F3141-BLK1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Solids, Total Suspended	< 2.0	2.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1657
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-06-20 09:06

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4F3141, Continued										
Blank (B4F3141-BLK2)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4F3141-BS1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Solids, Total Suspended	91.0	10.0	mg/L	100		91	85-115			
LCS (B4F3141-BS2)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Solids, Total Suspended	92.0	10.0	mg/L	100		92	85-115			
Reference (B4F3141-SRM1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Solids, Total Suspended	190	20.0	mg/L	210		90	80-120			
General Parameters, Batch B4F3146										
Blank (B4F3146-BLK1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4F3146-BLK2)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4F3146-BLK3)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4F3146-BS1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	89.9	1.0	mg/L	100		90	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	39.2	1.0	mg/L	50.0		78	0-200			
LCS (B4F3146-BS3)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	91.8	1.0	mg/L	100		92	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	40.6	1.0	mg/L	50.0		81	0-200			
LCS (B4F3146-BS5)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	89.3	1.0	mg/L	100		89	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	37.5	1.0	mg/L	50.0		75	0-200			
Reference (B4F3146-SRM1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4F3146-SRM2)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
pH	7.02	0.10	pH units	7.01		100	98-102			
Reference (B4F3146-SRM3)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
pH	7.02	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4F3182										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1657
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-06-20 09:06

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4F3182, Continued										
Blank (B4F3182-BLK1)				Prepared: 2024-06-17, Analyzed: 2024-06-18						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4F3182-BLK2)				Prepared: 2024-06-17, Analyzed: 2024-06-18						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4F3182-BS1)				Prepared: 2024-06-17, Analyzed: 2024-06-18						
Nitrogen, Total Kjeldahl	0.979	0.050	mg/L	1.00		98	85-115			
LCS (B4F3182-BS2)				Prepared: 2024-06-17, Analyzed: 2024-06-18						
Nitrogen, Total Kjeldahl	0.945	0.050	mg/L	1.00		94	85-115			
Microbiological Parameters, Batch B4F2791										
Blank (B4F2791-BLK1)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4F2791-BLK2)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4F2791-BLK3)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4F2791-BLK4)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24F1658
PO NUMBER		**RECEIVED / TEMP**	2024-06-13 10:34 / 18.1°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-06-20 12:21
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45456.30373

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1658
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-06-20 12:21

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (24F1658-01) | Matrix: Wastewater | Sampled: 2024-06-13 10:05					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2024-06-14	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-06-14	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**102**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**383**	1.0	mg/L	2024-06-18	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-06-18	
Alkalinity, Bicarbonate (as CaCO3)	**383**	1.0	mg/L	2024-06-18	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-06-18	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-06-18	
Ammonia, Total (as N)	**73.5**	0.050	mg/L	2024-06-14	
BOD, 5-day	**462**	2.0	mg/L	2024-06-19	
BOD, 5-day Carbonaceous	**390**	2.0	mg/L	2024-06-20	
Nitrogen, Total Kjeldahl	**102**	0.050	mg/L	2024-06-18	
pH	**7.79**	0.10	pH units	2024-06-18	HT2
Phosphorus, Total (as P)	**14.5**	0.0050	mg/L	2024-06-14	
Phosphorus, Dissolved Reactive	**7.06**	0.0050	mg/L	2024-06-13	
Solids, Total Suspended	**310**	2.0	mg/L	2024-06-18	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1658
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-06-20 12:21

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline(s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1658
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-06-20 12:21

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4F2739										
Blank (B4F2739-BLK1)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Blank (B4F2739-BLK2)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4F2739-BS1)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Nitrate (as N)	3.99	0.010	mg/L	4.00		100	90-110			
Nitrite (as N)	1.98	0.010	mg/L	2.00		99	85-115			
LCS (B4F2739-BS2)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Nitrate (as N)	3.98	0.010	mg/L	4.00		100	90-110			
Nitrite (as N)	2.02	0.010	mg/L	2.00		101	85-115			
General Parameters, Batch B4F2874										
Blank (B4F2874-BLK1)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4F2874-BS1)				Prepared: 2024-06-13, Analyzed: 2024-06-13						
Phosphorus, Dissolved Reactive	0.100	0.0050	mg/L	0.100		100	84-115			
General Parameters, Batch B4F2878										
Blank (B4F2878-BLK1)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4F2878-BLK2)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4F2878-BLK3)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4F2878-BLK4)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1658
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-06-20 12:21

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4F2878, Continued										
Blank (B4F2878-BLK5)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4F2878-BS1)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	0.990	0.050	mg/L	1.00		99	85-115			
LCS (B4F2878-BS2)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	1.00	0.050	mg/L	1.00		100	85-115			
LCS (B4F2878-BS3)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	1.03	0.050	mg/L	1.00		103	85-115			
LCS (B4F2878-BS4)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4F2878-BS5)				Prepared: 2024-06-14, Analyzed: 2024-06-14						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	85-115			
General Parameters, Batch B4F2885										
Blank (B4F2885-BLK1)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4F2885-BLK2)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4F2885-BLK3)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4F2885-BS1)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
LCS (B4F2885-BS2)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
LCS (B4F2885-BS3)				Prepared: 2024-06-13, Analyzed: 2024-06-14						
Phosphorus, Total (as P)	0.100	0.0050	mg/L	0.100		100	85-115			
General Parameters, Batch B4F2979										
Blank (B4F2979-BLK1)				Prepared: 2024-06-14, Analyzed: 2024-06-19						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B4F2979-BS1)				Prepared: 2024-06-14, Analyzed: 2024-06-19						
BOD, 5-day	183	51.4	mg/L	198		93	85-115			
General Parameters, Batch B4F3087										
Blank (B4F3087-BLK1)				Prepared: 2024-06-15, Analyzed: 2024-06-20						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4F3087-BS1)				Prepared: 2024-06-15, Analyzed: 2024-06-20						
BOD, 5-day Carbonaceous	176	33.8	mg/L	198		89	85-115			
General Parameters, Batch B4F3141										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1658
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-06-20 12:21

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4F3141, Continued										
Blank (B4F3141-BLK1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B4F3141-BLK2)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4F3141-BS1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Solids, Total Suspended	91.0	10.0	mg/L	100		91	85-115			
LCS (B4F3141-BS2)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Solids, Total Suspended	92.0	10.0	mg/L	100		92	85-115			
Reference (B4F3141-SRM1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Solids, Total Suspended	190	20.0	mg/L	210		90	80-120			
General Parameters, Batch B4F3146										
Blank (B4F3146-BLK1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4F3146-BLK2)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4F3146-BLK3)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4F3146-BS1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	89.9	1.0	mg/L	100		90	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	39.2	1.0	mg/L	50.0		78	0-200			
LCS (B4F3146-BS3)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	91.8	1.0	mg/L	100		92	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	40.6	1.0	mg/L	50.0		81	0-200			
LCS (B4F3146-BS5)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
Alkalinity, Total (as CaCO3)	89.3	1.0	mg/L	100		89	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	37.5	1.0	mg/L	50.0		75	0-200			
Reference (B4F3146-SRM1)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4F3146-SRM2)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
pH	7.02	0.10	pH units	7.01		100	98-102			
Reference (B4F3146-SRM3)				Prepared: 2024-06-18, Analyzed: 2024-06-18						
pH	7.02	0.10	pH units	7.01		100	98-102			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24F1658
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-06-20 12:21

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4F3182										
Blank (B4F3182-BLK1)				Prepared: 2024-06-17, Analyzed: 2024-06-18						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4F3182-BLK2)				Prepared: 2024-06-17, Analyzed: 2024-06-18						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4F3182-BS1)				Prepared: 2024-06-17, Analyzed: 2024-06-18						
Nitrogen, Total Kjeldahl	0.979	0.050	mg/L	1.00		98	85-115			
LCS (B4F3182-BS2)				Prepared: 2024-06-17, Analyzed: 2024-06-18						
Nitrogen, Total Kjeldahl	0.945	0.050	mg/L	1.00		94	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24C1212
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2024-03-11 14:28 / 11.4°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-18 13:23
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45362.39662

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1212
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-18 13:23

Analyte	Result	RL	Units	Analyzed	Qualifier
Duplicate (24C1212-01) | Matrix: Wastewater | Sampled: 2024-03-11 10:30					
Anions					
Chloride	**131**	0.10	mg/L	2024-03-12	
Nitrate (as N)	**2.18**	0.010	mg/L	2024-03-12	
Nitrite (as N)	**0.122**	0.010	mg/L	2024-03-12	
Phosphate (as P)	**0.285**	0.0050	mg/L	2024-03-12	
Calculated Parameters					
Nitrate+Nitrite (as N)	**2.30**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.47**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.04**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**186**	1.0	mg/L	2024-03-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-03-13	
Alkalinity, Bicarbonate (as CaCO3)	**186**	1.0	mg/L	2024-03-13	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-03-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-03-13	
Ammonia, Total (as N)	**2.12**	0.050	mg/L	2024-03-15	
BOD, 5-day Carbonaceous	**2.1**	2.0	mg/L	2024-03-18	
Nitrogen, Total Kjeldahl	**3.17**	0.050	mg/L	2024-03-14	
pH	**7.66**	0.10	pH units	2024-03-13	HT2
Phosphorus, Total (as P)	**0.418**	0.0050	mg/L	2024-03-13	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-03-13	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**173000**	1	MPN/100 mL	2024-03-12	
Coliforms, Fecal (Q-Tray)	**15900**	1	MPN/100 mL	2024-03-12	
Final Effluent (E233626) (24C1212-02) | Matrix: Wastewater | Sampled: 2024-03-11 10:30					
Anions					
Chloride	**132**	0.10	mg/L	2024-03-12	
Nitrate (as N)	**2.20**	0.010	mg/L	2024-03-12	
Nitrite (as N)	**0.122**	0.010	mg/L	2024-03-12	
Phosphate (as P)	**0.281**	0.0050	mg/L	2024-03-12	
Calculated Parameters					
Nitrate+Nitrite (as N)	**2.33**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.52**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.09**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**186**	1.0	mg/L	2024-03-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-03-13	
Alkalinity, Bicarbonate (as CaCO3)	**186**	1.0	mg/L	2024-03-13	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1212
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-18 13:23

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24C1212-02) | Matrix: Wastewater | Sampled: 2024-03-11 10:30, Continued					
General Parameters, Continued					
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-03-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-03-13	
Ammonia, Total (as N)	**2.11**	0.050	mg/L	2024-03-15	
BOD, 5-day Carbonaceous	**2.1**	2.0	mg/L	2024-03-18	
Nitrogen, Total Kjeldahl	**3.20**	0.050	mg/L	2024-03-14	
pH	**7.70**	0.10	pH units	2024-03-13	HT2
Phosphorus, Total (as P)	**0.416**	0.0050	mg/L	2024-03-13	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-03-13	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**105000**	1	MPN/100 mL	2024-03-12	
Coliforms, Fecal (Q-Tray)	**17600**	1	MPN/100 mL	2024-03-12	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1212
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-18 13:23

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1212
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-18 13:23

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4C2285										
Blank (B4C2285-BLK1)				Prepared: 2024-03-12, Analyzed: 2024-03-12						
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Duplicate (B4C2285-DUP1)			**Source: 24C1212-01**	Prepared: 2024-03-12, Analyzed: 2024-03-12						
Phosphate (as P)	0.288	0.0050	mg/L		0.285			1	20	
Matrix Spike (B4C2285-MS1)			**Source: 24C1212-01**	Prepared: 2024-03-12, Analyzed: 2024-03-12						
Phosphate (as P)	0.362	0.0050	mg/L	0.100	0.285	77	70-130			
Anions, Batch B4C2288										
Blank (B4C2288-BLK1)				Prepared: 2024-03-12, Analyzed: 2024-03-12						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4C2288-BS1)				Prepared: 2024-03-12, Analyzed: 2024-03-12						
Chloride	16.1	0.10	mg/L	16.0		101	90-110			
Nitrate (as N)	3.91	0.010	mg/L	4.00		98	90-110			
Nitrite (as N)	2.17	0.010	mg/L	2.00		108	85-115			
General Parameters, Batch B4C2354										
Blank (B4C2354-BLK1)				Prepared: 2024-03-12, Analyzed: 2024-03-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4C2354-BLK2)				Prepared: 2024-03-12, Analyzed: 2024-03-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4C2354-BS1)				Prepared: 2024-03-12, Analyzed: 2024-03-13						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
LCS (B4C2354-BS2)				Prepared: 2024-03-12, Analyzed: 2024-03-13						
Phosphorus, Total (as P)	0.106	0.0050	mg/L	0.100		106	85-115			
General Parameters, Batch B4C2358										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1212
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-18 13:23

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4C2358, Continued										
Blank (B4C2358-BLK1)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	6.10	0.10	pH units							HT2
Blank (B4C2358-BLK2)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.51	0.10	pH units							HT2
Blank (B4C2358-BLK3)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.96	0.10	pH units							HT2
LCS (B4C2358-BS1)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	105	1.0	mg/L	100		105	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	76.1	1.0	mg/L	50.0		152	0-200			
LCS (B4C2358-BS2)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	96.5	1.0	mg/L	100		97	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	66.0	1.0	mg/L	50.0		132	0-200			
LCS (B4C2358-BS3)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	96.6	1.0	mg/L	100		97	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	66.7	1.0	mg/L	50.0		133	0-200			
Reference (B4C2358-SRM1)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
pH	7.04	0.10	pH units	7.01		100	98-102			
Reference (B4C2358-SRM2)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4C2358-SRM3)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
pH	7.03	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4C2374										
Blank (B4C2374-BLK1)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B4C2374-BLK2)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4C2374-BS1)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Solids, Total Suspended	85.0	10.0	mg/L	100		85	85-115			
LCS (B4C2374-BS2)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Solids, Total Suspended	85.9	10.1	mg/L	100		86	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1212
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-18 13:23

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4C2433										
Blank (B4C2433-BLK1)				Prepared: 2024-03-13, Analyzed: 2024-03-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4C2433-BLK2)				Prepared: 2024-03-13, Analyzed: 2024-03-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4C2433-BS1)				Prepared: 2024-03-13, Analyzed: 2024-03-14						
Nitrogen, Total Kjeldahl	0.907	0.050	mg/L	1.00		91	85-115			
LCS (B4C2433-BS2)				Prepared: 2024-03-13, Analyzed: 2024-03-14						
Nitrogen, Total Kjeldahl	0.910	0.050	mg/L	1.00		91	85-115			
General Parameters, Batch B4C2487										
Blank (B4C2487-BLK1)				Prepared: 2024-03-13, Analyzed: 2024-03-18						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4C2487-BS1)				Prepared: 2024-03-13, Analyzed: 2024-03-18						
BOD, 5-day Carbonaceous	200	33.2	mg/L	198		101	85-115			
General Parameters, Batch B4C2677										
Blank (B4C2677-BLK1)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4C2677-BLK2)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4C2677-BLK3)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4C2677-BS1)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	1.06	0.050	mg/L	1.00		106	85-115			
LCS (B4C2677-BS2)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	1.06	0.050	mg/L	1.00		106	85-115			
LCS (B4C2677-BS3)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	1.08	0.050	mg/L	1.00		108	85-115			
Microbiological Parameters, Batch B4C2338										
Blank (B4C2338-BLK1)				Prepared: 2024-03-12, Analyzed: 2024-03-12						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4C2338-BLK2)				Prepared: 2024-03-12, Analyzed: 2024-03-12						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4C2338-BLK3)				Prepared: 2024-03-12, Analyzed: 2024-03-12						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4C2338-BLK4)				Prepared: 2024-03-12, Analyzed: 2024-03-12						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Duplicate (B4C2338-DUP3)		**Source: 24C1212-01**		Prepared: 2024-03-12, Analyzed: 2024-03-12						
Coliforms, Fecal (Q-Tray)	24200	1	MPN/100 mL		15900			41	80	

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1212
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-03-18 13:23

QC Qualifiers:

HT2	The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24C1215
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2024-03-11 11:28 / 11.4°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-03-18 13:31
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45362.39662

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1215
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-03-18 13:31

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (24C1215-01) | Matrix: Wastewater | Sampled: 2024-03-11 10:50					
Anions					
Nitrate (as N)	**0.118**	0.010	mg/L	2024-03-12	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-03-12	
Phosphate (as P)	**4.92**	0.0050	mg/L	2024-03-12	
Calculated Parameters					
Nitrate+Nitrite (as N)	**0.118**	0.0100	mg/L	N/A	
Nitrogen, Total	**81.2**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**375**	1.0	mg/L	2024-03-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-03-13	
Alkalinity, Bicarbonate (as CaCO3)	**375**	1.0	mg/L	2024-03-13	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-03-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-03-13	
Ammonia, Total (as N)	**61.5**	0.050	mg/L	2024-03-15	
BOD, 5-day	**279**	2.0	mg/L	2024-03-18	
BOD, 5-day Carbonaceous	**306**	2.0	mg/L	2024-03-18	
Nitrogen, Total Kjeldahl	**81.1**	0.050	mg/L	2024-03-14	
pH	**7.99**	0.10	pH units	2024-03-13	HT2
Phosphorus, Total (as P)	**9.88**	0.0050	mg/L	2024-03-13	
Solids, Total Suspended	**336**	2.0	mg/L	2024-03-13	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1215
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-03-18 13:31

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1215
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-03-18 13:31

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4C2285										
Blank (B4C2285-BLK1)				Prepared: 2024-03-12, Analyzed: 2024-03-12						
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Anions, Batch B4C2288										
Blank (B4C2288-BLK1)				Prepared: 2024-03-12, Analyzed: 2024-03-12						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4C2288-BS1)				Prepared: 2024-03-12, Analyzed: 2024-03-12						
Nitrate (as N)	3.91	0.010	mg/L	4.00		98	90-110			
Nitrite (as N)	2.17	0.010	mg/L	2.00		108	85-115			
General Parameters, Batch B4C2354										
Blank (B4C2354-BLK1)				Prepared: 2024-03-12, Analyzed: 2024-03-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4C2354-BLK2)				Prepared: 2024-03-12, Analyzed: 2024-03-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4C2354-BS1)				Prepared: 2024-03-12, Analyzed: 2024-03-13						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
LCS (B4C2354-BS2)				Prepared: 2024-03-12, Analyzed: 2024-03-13						
Phosphorus, Total (as P)	0.106	0.0050	mg/L	0.100		106	85-115			
General Parameters, Batch B4C2358										
Blank (B4C2358-BLK1)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	6.10	0.10	pH units							HT2

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1215
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-03-18 13:31

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4C2358, Continued										
Blank (B4C2358-BLK2)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.51	0.10	pH units							HT2
Blank (B4C2358-BLK3)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
pH	5.96	0.10	pH units							HT2
LCS (B4C2358-BS1)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	105	1.0	mg/L	100		105	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	76.1	1.0	mg/L	50.0		152	0-200			
LCS (B4C2358-BS2)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	96.5	1.0	mg/L	100		97	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	66.0	1.0	mg/L	50.0		132	0-200			
LCS (B4C2358-BS3)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Alkalinity, Total (as CaCO3)	96.6	1.0	mg/L	100		97	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	66.7	1.0	mg/L	50.0		133	0-200			
Reference (B4C2358-SRM1)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
pH	7.04	0.10	pH units	7.01		100	98-102			
Reference (B4C2358-SRM2)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B4C2358-SRM3)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
pH	7.03	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4C2374										
Blank (B4C2374-BLK1)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B4C2374-BLK2)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4C2374-BS1)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Solids, Total Suspended	85.0	10.0	mg/L	100		85	85-115			
LCS (B4C2374-BS2)				Prepared: 2024-03-13, Analyzed: 2024-03-13						
Solids, Total Suspended	85.9	10.1	mg/L	100		86	85-115			
Duplicate (B4C2374-DUP1)		**Source: 24C1215-01**		Prepared: 2024-03-13, Analyzed: 2024-03-13						
Solids, Total Suspended	316	2.0	mg/L		336			6	20	
Duplicate (B4C2374-DUP2)		**Source: 24C1215-01**		Prepared: 2024-03-13, Analyzed: 2024-03-13						
Solids, Total Suspended	324	2.0	mg/L		336			4	20	

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24C1215
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-03-18 13:31

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4C2433										
Blank (B4C2433-BLK1)				Prepared: 2024-03-13, Analyzed: 2024-03-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4C2433-BLK2)				Prepared: 2024-03-13, Analyzed: 2024-03-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4C2433-BS1)				Prepared: 2024-03-13, Analyzed: 2024-03-14						
Nitrogen, Total Kjeldahl	0.907	0.050	mg/L	1.00		91	85-115			
LCS (B4C2433-BS2)				Prepared: 2024-03-13, Analyzed: 2024-03-14						
Nitrogen, Total Kjeldahl	0.910	0.050	mg/L	1.00		91	85-115			
General Parameters, Batch B4C2487										
Blank (B4C2487-BLK1)				Prepared: 2024-03-13, Analyzed: 2024-03-18						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4C2487-BS1)				Prepared: 2024-03-13, Analyzed: 2024-03-18						
BOD, 5-day Carbonaceous	200	33.2	mg/L	198		101	85-115			
General Parameters, Batch B4C2488										
Blank (B4C2488-BLK1)				Prepared: 2024-03-13, Analyzed: 2024-03-18						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B4C2488-BS1)				Prepared: 2024-03-13, Analyzed: 2024-03-18						
BOD, 5-day	204	51.1	mg/L	198		103	85-115			
General Parameters, Batch B4C2677										
Blank (B4C2677-BLK1)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4C2677-BLK2)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4C2677-BLK3)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4C2677-BS1)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	1.06	0.050	mg/L	1.00		106	85-115			
LCS (B4C2677-BS2)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	1.06	0.050	mg/L	1.00		106	85-115			
LCS (B4C2677-BS3)				Prepared: 2024-03-15, Analyzed: 2024-03-15						
Ammonia, Total (as N)	1.08	0.050	mg/L	1.00		108	85-115			

QC Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24E2538
PO NUMBER		**RECEIVED / TEMP**	2024-05-21 11:40 / 9.2°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-05-28 13:26
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45433.37535

Introduction:

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Ahead of the Curve

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By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2538
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-05-28 13:26

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24E2538-01) | Matrix: Wastewater | Sampled: 2024-05-21 08:00					
Anions					
Chloride	**132**	0.10	mg/L	2024-05-23	
Nitrate (as N)	**1.78**	0.010	mg/L	2024-05-23	
Nitrite (as N)	**0.322**	0.010	mg/L	2024-05-23	
Calculated Parameters					
Nitrate+Nitrite (as N)	**2.10**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.97**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.80**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**184**	1.0	mg/L	2024-05-25	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-05-25	
Alkalinity, Bicarbonate (as CaCO3)	**184**	1.0	mg/L	2024-05-25	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-05-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-05-25	
Ammonia, Total (as N)	**2.07**	0.050	mg/L	2024-05-24	
BOD, 5-day Carbonaceous	< 5.0	2.0	mg/L	2024-05-28	
Nitrogen, Total Kjeldahl	**3.87**	0.050	mg/L	2024-05-27	
pH	**7.67**	0.10	pH units	2024-05-25	HT2
Phosphorus, Total (as P)	**0.237**	0.0050	mg/L	2024-05-24	
Phosphorus, Dissolved Reactive	**0.0650**	0.0050	mg/L	2024-05-24	
Solids, Total Suspended	**2.0**	2.0	mg/L	2024-05-25	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**173000**	1	MPN/100 mL	2024-05-21	
Coliforms, Fecal (Q-Tray)	**17800**	1	MPN/100 mL	2024-05-21	
Field Blank (24E2538-02) | Matrix: Wastewater | Sampled: 2024-05-21 09:45					
Anions					
Chloride	< 0.10	0.10	mg/L	2024-05-23	
Nitrate (as N)	< 0.010	0.010	mg/L	2024-05-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-05-23	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2024-05-25	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-05-25	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-05-25	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-05-25	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2538
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-05-28 13:26

Analyte	Result	RL	Units	Analyzed	Qualifier
Field Blank (24E2538-02) | Matrix: Wastewater | Sampled: 2024-05-21 09:45, Continued					
General Parameters, Continued					
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-05-25	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2024-05-24	
BOD, 5-day Carbonaceous	< 5.0	2.0	mg/L	2024-05-28	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2024-05-27	
pH	**5.70**	0.10	pH units	2024-05-25	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2024-05-24	
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L	2024-05-24	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-05-25	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2024-05-21	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2024-05-21	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2538
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-05-28 13:26

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2538
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-05-28 13:26

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4E3584										
Blank (B4E3584-BLK1)				Prepared: 2024-05-23, Analyzed: 2024-05-23						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Blank (B4E3584-BLK2)				Prepared: 2024-05-23, Analyzed: 2024-05-23						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4E3584-BS1)				Prepared: 2024-05-23, Analyzed: 2024-05-23						
Chloride	15.8	0.10	mg/L	16.0		99	90-110			
Nitrate (as N)	3.93	0.010	mg/L	4.00		98	90-110			
Nitrite (as N)	2.12	0.010	mg/L	2.00		106	85-115			
LCS (B4E3584-BS2)				Prepared: 2024-05-23, Analyzed: 2024-05-23						
Chloride	16.1	0.10	mg/L	16.0		101	90-110			
Nitrate (as N)	3.83	0.010	mg/L	4.00		96	90-110			
Nitrite (as N)	2.14	0.010	mg/L	2.00		107	85-115			
General Parameters, Batch B4E3546										
Blank (B4E3546-BLK1)				Prepared: 2024-05-22, Analyzed: 2024-05-24						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
Blank (B4E3546-BLK2)				Prepared: 2024-05-22, Analyzed: 2024-05-24						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4E3546-BS1)				Prepared: 2024-05-22, Analyzed: 2024-05-24						
Phosphorus, Dissolved Reactive	0.0990	0.0050	mg/L	0.100		99	84-115			
LCS (B4E3546-BS2)				Prepared: 2024-05-22, Analyzed: 2024-05-24						
Phosphorus, Dissolved Reactive	0.0980	0.0050	mg/L	0.100		98	84-115			
General Parameters, Batch B4E3724										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2538
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-05-28 13:26

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4E3724, Continued										
Blank (B4E3724-BLK1)				Prepared: 2024-05-23, Analyzed: 2024-05-28						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4E3724-BS1)				Prepared: 2024-05-23, Analyzed: 2024-05-28						
BOD, 5-day Carbonaceous	201	33.6	mg/L	198		101	85-115			
General Parameters, Batch B4E3769										
Blank (B4E3769-BLK1)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4E3769-BLK2)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4E3769-BLK3)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4E3769-BLK4)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4E3769-BS1)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	85-115			
LCS (B4E3769-BS2)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	0.978	0.050	mg/L	1.00		98	85-115			
LCS (B4E3769-BS3)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	0.980	0.050	mg/L	1.00		98	85-115			
LCS (B4E3769-BS4)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	0.973	0.050	mg/L	1.00		97	85-115			
Duplicate (B4E3769-DUP4)		**Source: 24E2538-01**		Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	2.01	0.050	mg/L		2.07			3	15	
General Parameters, Batch B4E3805										
Blank (B4E3805-BLK1)				Prepared: 2024-05-23, Analyzed: 2024-05-24						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4E3805-BLK2)				Prepared: 2024-05-23, Analyzed: 2024-05-24						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4E3805-BS1)				Prepared: 2024-05-23, Analyzed: 2024-05-24						
Phosphorus, Total (as P)	0.113	0.0050	mg/L	0.100		113	85-115			
LCS (B4E3805-BS2)				Prepared: 2024-05-23, Analyzed: 2024-05-24						
Phosphorus, Total (as P)	0.110	0.0050	mg/L	0.100		110	85-115			
General Parameters, Batch B4E3855										
Blank (B4E3855-BLK1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B4E3855-BLK2)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Solids, Total Suspended	< 2.0	2.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2538
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-05-28 13:26

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4E3855, Continued										
LCS (B4E3855-BS1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Solids, Total Suspended	95.0	10.0	mg/L	100		95	85-115			
LCS (B4E3855-BS2)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Solids, Total Suspended	90.0	10.0	mg/L	100		90	85-115			
Reference (B4E3855-SRM1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Solids, Total Suspended	184	20.0	mg/L	210		88	80-120			
General Parameters, Batch B4E3953										
Blank (B4E3953-BLK1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4E3953-BLK2)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4E3953-BLK3)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4E3953-BS1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Total (as CaCO3)	97.4	1.0	mg/L	100		97	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	52.5	1.0	mg/L	50.0		105	0-200			
LCS (B4E3953-BS2)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Total (as CaCO3)	97.9	1.0	mg/L	100		98	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	46.3	1.0	mg/L	50.0		93	0-200			
LCS (B4E3953-BS3)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	50.0			0-200			
Reference (B4E3953-SRM1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
pH	7.04	0.10	pH units	7.01		100	98-102			
Reference (B4E3953-SRM2)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
pH	7.05	0.10	pH units	7.01		101	98-102			
Reference (B4E3953-SRM3)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
pH	7.05	0.10	pH units	7.01		101	98-102			
General Parameters, Batch B4E3984										
Blank (B4E3984-BLK1)				Prepared: 2024-05-25, Analyzed: 2024-05-27						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2538
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-05-28 13:26

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4E3984, Continued										
Blank (B4E3984-BLK2)				Prepared: 2024-05-25, Analyzed: 2024-05-27						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4E3984-BS1)				Prepared: 2024-05-25, Analyzed: 2024-05-27						
Nitrogen, Total Kjeldahl	0.924	0.050	mg/L	1.00		92	85-115			
LCS (B4E3984-BS2)				Prepared: 2024-05-25, Analyzed: 2024-05-27						
Nitrogen, Total Kjeldahl	0.949	0.050	mg/L	1.00		95	85-115			
Microbiological Parameters, Batch B4E3417										
Blank (B4E3417-BLK1)				Prepared: 2024-05-21, Analyzed: 2024-05-21						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4E3417-BLK2)				Prepared: 2024-05-21, Analyzed: 2024-05-21						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4E3417-BLK3)				Prepared: 2024-05-21, Analyzed: 2024-05-21						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Duplicate (B4E3417-DUP1)	**Source: 24E2538-01**			Prepared: 2024-05-21, Analyzed: 2024-05-21						
Coliforms, Fecal (Q-Tray)	14200	1	MPN/100 mL		17800			23	80	

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24E2535
PO NUMBER		**RECEIVED / TEMP**	2024-05-21 11:40 / 9.2°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-05-28 13:27
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45433.37535

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2535
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-05-28 13:27

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (24E2535-01) | Matrix: Wastewater | Sampled: 2024-05-21 10:25					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2024-05-21	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-05-21	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**113**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**408**	1.0	mg/L	2024-05-25	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-05-25	
Alkalinity, Bicarbonate (as CaCO3)	**408**	1.0	mg/L	2024-05-25	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-05-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-05-25	
Ammonia, Total (as N)	**67.6**	0.050	mg/L	2024-05-24	
BOD, 5-day	**497**	2.0	mg/L	2024-05-28	
BOD, 5-day Carbonaceous	**333**	2.0	mg/L	2024-05-28	
Nitrogen, Total Kjeldahl	**113**	0.050	mg/L	2024-05-27	
pH	**7.84**	0.10	pH units	2024-05-25	HT2
Phosphorus, Total (as P)	**13.5**	0.0050	mg/L	2024-05-24	
Phosphorus, Dissolved Reactive	**6.26**	0.0050	mg/L	2024-05-24	
Solids, Total Suspended	**357**	2.0	mg/L	2024-05-25	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2535
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-05-28 13:27

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2535
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-05-28 13:27

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4E3309										
Blank (B4E3309-BLK1)				Prepared: 2024-05-21, Analyzed: 2024-05-21						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4E3309-BS1)				Prepared: 2024-05-21, Analyzed: 2024-05-21						
Nitrate (as N)	4.05	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	2.10	0.010	mg/L	2.00		105	85-115			
General Parameters, Batch B4E3546										
Blank (B4E3546-BLK1)				Prepared: 2024-05-22, Analyzed: 2024-05-24						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
Blank (B4E3546-BLK2)				Prepared: 2024-05-22, Analyzed: 2024-05-24						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4E3546-BS1)				Prepared: 2024-05-22, Analyzed: 2024-05-24						
Phosphorus, Dissolved Reactive	0.0990	0.0050	mg/L	0.100		99	84-115			
LCS (B4E3546-BS2)				Prepared: 2024-05-22, Analyzed: 2024-05-24						
Phosphorus, Dissolved Reactive	0.0980	0.0050	mg/L	0.100		98	84-115			
General Parameters, Batch B4E3724										
Blank (B4E3724-BLK1)				Prepared: 2024-05-23, Analyzed: 2024-05-28						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4E3724-BS1)				Prepared: 2024-05-23, Analyzed: 2024-05-28						
BOD, 5-day Carbonaceous	201	33.6	mg/L	198		101	85-115			
General Parameters, Batch B4E3727										
Blank (B4E3727-BLK1)				Prepared: 2024-05-23, Analyzed: 2024-05-28						
BOD, 5-day	< 2.0	2.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2535
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-05-28 13:27

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4E3727, Continued										
LCS (B4E3727-BS1)				Prepared: 2024-05-23, Analyzed: 2024-05-28						
BOD, 5-day	206	37.8	mg/L	198		104	85-115			
General Parameters, Batch B4E3769										
Blank (B4E3769-BLK1)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4E3769-BLK2)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4E3769-BLK3)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4E3769-BLK4)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4E3769-BS1)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	85-115			
LCS (B4E3769-BS2)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	0.978	0.050	mg/L	1.00		98	85-115			
LCS (B4E3769-BS3)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	0.980	0.050	mg/L	1.00		98	85-115			
LCS (B4E3769-BS4)				Prepared: 2024-05-24, Analyzed: 2024-05-24						
Ammonia, Total (as N)	0.973	0.050	mg/L	1.00		97	85-115			
General Parameters, Batch B4E3805										
Blank (B4E3805-BLK1)				Prepared: 2024-05-23, Analyzed: 2024-05-24						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4E3805-BLK2)				Prepared: 2024-05-23, Analyzed: 2024-05-24						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4E3805-BS1)				Prepared: 2024-05-23, Analyzed: 2024-05-24						
Phosphorus, Total (as P)	0.113	0.0050	mg/L	0.100		113	85-115			
LCS (B4E3805-BS2)				Prepared: 2024-05-23, Analyzed: 2024-05-24						
Phosphorus, Total (as P)	0.110	0.0050	mg/L	0.100		110	85-115			
General Parameters, Batch B4E3855										
Blank (B4E3855-BLK1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B4E3855-BLK2)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4E3855-BS1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Solids, Total Suspended	95.0	10.0	mg/L	100		95	85-115			
LCS (B4E3855-BS2)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Solids, Total Suspended	90.0	10.0	mg/L	100		90	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2535
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-05-28 13:27

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4E3855, Continued										
Duplicate (B4E3855-DUP2)	**Source: 24E2535-01**			Prepared: 2024-05-25, Analyzed: 2024-05-25						
Solids, Total Suspended	347	2.0	mg/L		357			3	20	
Reference (B4E3855-SRM1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Solids, Total Suspended	184	20.0	mg/L	210		88	80-120			
General Parameters, Batch B4E3953										
Blank (B4E3953-BLK1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4E3953-BLK2)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4E3953-BLK3)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4E3953-BS1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Total (as CaCO3)	97.4	1.0	mg/L	100		97	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	52.5	1.0	mg/L	50.0		105	0-200			
LCS (B4E3953-BS2)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Total (as CaCO3)	97.9	1.0	mg/L	100		98	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	46.3	1.0	mg/L	50.0		93	0-200			
LCS (B4E3953-BS3)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	50.0			0-200			
Reference (B4E3953-SRM1)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
pH	7.04	0.10	pH units	7.01		100	98-102			
Reference (B4E3953-SRM2)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
pH	7.05	0.10	pH units	7.01		101	98-102			
Reference (B4E3953-SRM3)				Prepared: 2024-05-25, Analyzed: 2024-05-25						
pH	7.05	0.10	pH units	7.01		101	98-102			
General Parameters, Batch B4E3984										
Blank (B4E3984-BLK1)				Prepared: 2024-05-25, Analyzed: 2024-05-27						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4E3984-BLK2)				Prepared: 2024-05-25, Analyzed: 2024-05-27						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24E2535
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-05-28 13:27

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4E3984, Continued										
LCS (B4E3984-BS1)				Prepared: 2024-05-25, Analyzed: 2024-05-27						
Nitrogen, Total Kjeldahl	0.924	0.050	mg/L	1.00		92	85-115			
LCS (B4E3984-BS2)				Prepared: 2024-05-25, Analyzed: 2024-05-27						
Nitrogen, Total Kjeldahl	0.949	0.050	mg/L	1.00		95	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24K2800
PO NUMBER		**RECEIVED / TEMP**	2024-11-25 10:56 / 11.2°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-02 11:37
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	No Number

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at hhannaoui@caro.ca

Authorized By:

Hanane El Hannaoui
Junior Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24K2800
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-02 11:37

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (24K2800-01) | Matrix: Water | Sampled: 2024-11-25 09:00					
Anions					
Chloride	**142**	0.10	mg/L	2024-11-26	
Nitrate (as N)	**4.11**	0.010	mg/L	2024-11-26	
Nitrite (as N)	**0.278**	0.010	mg/L	2024-11-26	
Calculated Parameters					
Nitrate+Nitrite (as N)	**4.39**	0.0100	mg/L	N/A	
Nitrogen, Total	**6.72**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.39**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**156**	1.0	mg/L	2024-11-28	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-11-28	
Alkalinity, Bicarbonate (as CaCO3)	**156**	1.0	mg/L	2024-11-28	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-11-28	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-11-28	
Ammonia, Total (as N)	**0.943**	0.050	mg/L	2024-11-28	
BOD, 5-day Carbonaceous	< 3.6	2.0	mg/L	2024-12-02	
Nitrogen, Total Kjeldahl	**2.33**	0.050	mg/L	2024-11-28	
pH	**7.97**	0.10	pH units	2024-11-28	HT2
Phosphorus, Total (as P)	**1.16**	0.0050	mg/L	2024-11-28	
Phosphorus, Dissolved Reactive	**0.960**	0.0050	mg/L	2024-11-26	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-11-28	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**173000**	1	MPN/100 mL	2024-11-25	
Coliforms, Fecal (Q-Tray)	**23800**	1	MPN/100 mL	2024-11-25	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24K2800
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-02 11:37

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24K2800
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-02 11:37

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4K3701										
Blank (B4K3701-BLK1)				Prepared: 2024-11-26, Analyzed: 2024-11-26						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4K3701-BS1)				Prepared: 2024-11-26, Analyzed: 2024-11-26						
Chloride	16.2	0.10	mg/L	16.0		101	90-110			
Nitrate (as N)	3.97	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.11	0.010	mg/L	2.00		105	85-115			
General Parameters, Batch B4K3815										
Blank (B4K3815-BLK1)				Prepared: 2024-11-26, Analyzed: 2024-11-26						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4K3815-BS1)				Prepared: 2024-11-26, Analyzed: 2024-11-26						
Phosphorus, Dissolved Reactive	0.108	0.0050	mg/L	0.100		108	84-115			
Duplicate (B4K3815-DUP1)			**Source: 24K2800-01**	Prepared: 2024-11-26, Analyzed: 2024-11-26						
Phosphorus, Dissolved Reactive	0.970	0.0050	mg/L		0.960			1	14	
General Parameters, Batch B4K3926										
Blank (B4K3926-BLK1)				Prepared: 2024-11-27, Analyzed: 2024-12-02						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4K3926-BS1)				Prepared: 2024-11-27, Analyzed: 2024-12-02						
BOD, 5-day Carbonaceous	207	60.5	mg/L	198		105	85-115			
General Parameters, Batch B4K3941										
Blank (B4K3941-BLK1)				Prepared: 2024-11-27, Analyzed: 2024-11-28						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4K3941-BLK2)				Prepared: 2024-11-27, Analyzed: 2024-11-28						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Lake Country, District of (Wastewater)
PROJECT Final Effluent- PE14651

WORK ORDER 24K2800
REPORTED 2024-12-02 11:37

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4K3941, Continued										
LCS (B4K3941-BS1)				Prepared: 2024-11-27, Analyzed: 2024-11-28						
Nitrogen, Total Kjeldahl	0.863	0.050	mg/L	1.00		86	85-115			
LCS (B4K3941-BS2)				Prepared: 2024-11-27, Analyzed: 2024-11-28						
Nitrogen, Total Kjeldahl	0.903	0.050	mg/L	1.00		90	85-115			
General Parameters, Batch B4K3969										
Blank (B4K3969-BLK1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4K3969-BS1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Solids, Total Suspended	97.5	5.0	mg/L	100		98	85-115			
General Parameters, Batch B4K3987										
Blank (B4K3987-BLK1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4K3987-BLK2)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4K3987-BLK3)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4K3987-BLK4)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4K3987-BS1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4K3987-BS2)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4K3987-BS3)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	85-115			
LCS (B4K3987-BS4)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	0.985	0.050	mg/L	1.00		98	85-115			
General Parameters, Batch B4K4000										
Blank (B4K4000-BLK1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4K4000-BLK2)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4K4000-BLK3)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4K4000-BS1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
LCS (B4K4000-BS2)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24K2800
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-12-02 11:37

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4K4000, Continued										
LCS (B4K4000-BS3)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
General Parameters, Batch B4K4064										
Blank (B4K4064-BLK1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4K4064-BS1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Alkalinity, Total (as CaCO3)	90.1	1.0	mg/L	100		90	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	36.7	1.0	mg/L	50.0		73	0-200			
Reference (B4K4064-SRM1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
pH	7.02	0.10	pH units	7.01		100	98-102			
Microbiological Parameters, Batch B4K3686										
Blank (B4K3686-BLK1)				Prepared: 2024-11-25, Analyzed: 2024-11-25						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4K3686-BLK2)				Prepared: 2024-11-25, Analyzed: 2024-11-25						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24K2799
PO NUMBER		**RECEIVED / TEMP**	2024-11-25 10:56 / 11.2°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-02 13:56
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	No Number

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at hhannaoui@caro.ca

Authorized By:

Hanane El Hannaoui
Junior Account Manager

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24K2799
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-02 13:56

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (24K2799-01) | Matrix: Water | Sampled: 2024-11-25 10:20					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2024-11-26	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-11-26	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**88.3**	1.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**420**	1.0	mg/L	2024-11-28	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-11-28	
Alkalinity, Bicarbonate (as CaCO3)	**420**	1.0	mg/L	2024-11-28	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-11-28	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-11-28	
Ammonia, Total (as N)	**73.5**	0.050	mg/L	2024-11-28	
BOD, 5-day	**434**	2.0	mg/L	2024-12-02	
BOD, 5-day Carbonaceous	**324**	2.0	mg/L	2024-12-02	
Nitrogen, Total Kjeldahl	**88.3**	0.050	mg/L	2024-11-28	
pH	**8.20**	0.10	pH units	2024-11-28	HT2
Phosphorus, Total (as P)	**12.9**	0.0050	mg/L	2024-11-28	
Phosphorus, Dissolved Reactive	**6.76**	0.0050	mg/L	2024-11-26	
Solids, Total Suspended	**322**	2.0	mg/L	2024-11-28	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24K2799
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-02 13:56

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24K2799
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-02 13:56

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4K3701										
Blank (B4K3701-BLK1)				Prepared: 2024-11-26, Analyzed: 2024-11-26						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4K3701-BS1)				Prepared: 2024-11-26, Analyzed: 2024-11-26						
Nitrate (as N)	3.97	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.11	0.010	mg/L	2.00		105	85-115			
General Parameters, Batch B4K3815										
Blank (B4K3815-BLK1)				Prepared: 2024-11-26, Analyzed: 2024-11-26						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4K3815-BS1)				Prepared: 2024-11-26, Analyzed: 2024-11-26						
Phosphorus, Dissolved Reactive	0.108	0.0050	mg/L	0.100		108	84-115			
General Parameters, Batch B4K3926										
Blank (B4K3926-BLK1)				Prepared: 2024-11-27, Analyzed: 2024-12-02						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4K3926-BS1)				Prepared: 2024-11-27, Analyzed: 2024-12-02						
BOD, 5-day Carbonaceous	207	60.5	mg/L	198		105	85-115			
General Parameters, Batch B4K3927										
Blank (B4K3927-BLK1)				Prepared: 2024-11-27, Analyzed: 2024-12-02						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B4K3927-BS1)				Prepared: 2024-11-27, Analyzed: 2024-12-02						
BOD, 5-day	204	50.5	mg/L	198		103	85-115			
General Parameters, Batch B4K3941										
Blank (B4K3941-BLK1)				Prepared: 2024-11-27, Analyzed: 2024-11-28						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24K2799
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-02 13:56

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4K3941, Continued										
Blank (B4K3941-BLK1), Continued				Prepared: 2024-11-27, Analyzed: 2024-11-28						
Blank (B4K3941-BLK2)				Prepared: 2024-11-27, Analyzed: 2024-11-28						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4K3941-BS1)				Prepared: 2024-11-27, Analyzed: 2024-11-28						
Nitrogen, Total Kjeldahl	0.863	0.050	mg/L	1.00		86	85-115			
LCS (B4K3941-BS2)				Prepared: 2024-11-27, Analyzed: 2024-11-28						
Nitrogen, Total Kjeldahl	0.903	0.050	mg/L	1.00		90	85-115			
General Parameters, Batch B4K3969										
Blank (B4K3969-BLK1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4K3969-BS1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Solids, Total Suspended	97.5	5.0	mg/L	100		98	85-115			
General Parameters, Batch B4K3987										
Blank (B4K3987-BLK1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4K3987-BLK2)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4K3987-BLK3)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4K3987-BLK4)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4K3987-BS1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4K3987-BS2)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4K3987-BS3)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	85-115			
LCS (B4K3987-BS4)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Ammonia, Total (as N)	0.985	0.050	mg/L	1.00		98	85-115			
General Parameters, Batch B4K4000										
Blank (B4K4000-BLK1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4K4000-BLK2)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4K4000-BLK3)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24K2799
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-12-02 13:56

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4K4000, Continued										
LCS (B4K4000-BS1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
LCS (B4K4000-BS2)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
LCS (B4K4000-BS3)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
General Parameters, Batch B4K4064										
Blank (B4K4064-BLK1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4K4064-BS1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
Alkalinity, Total (as CaCO3)	90.1	1.0	mg/L	100		90	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	36.7	1.0	mg/L	50.0		73	0-200			
Reference (B4K4064-SRM1)				Prepared: 2024-11-28, Analyzed: 2024-11-28						
pH	7.02	0.10	pH units	7.01		100	98-102			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24J0927
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2024-10-07 12:00 / 17.6°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-15 09:38
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45572.35282

Introduction:

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If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0927
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-15 09:38

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24J0927-01) | Matrix: Wastewater | Sampled: 2024-10-07 10:45					
Anions					
Chloride	**132**	0.10	mg/L	2024-10-08	
Nitrate (as N)	**1.95**	0.010	mg/L	2024-10-08	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-10-08	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.95**	0.0100	mg/L	N/A	
Nitrogen, Total	**4.56**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.70**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**167**	1.0	mg/L	2024-10-10	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-10-10	
Alkalinity, Bicarbonate (as CaCO3)	**167**	1.0	mg/L	2024-10-10	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-10-10	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-10-10	
Ammonia, Total (as N)	**0.908**	0.050	mg/L	2024-10-10	
BOD, 5-day Carbonaceous	< 3.2	2.0	mg/L	2024-10-14	
Nitrogen, Total Kjeldahl	**2.61**	0.050	mg/L	2024-10-11	
pH	**7.93**	0.10	pH units	2024-10-10	HT2
Phosphorus, Total (as P)	**0.664**	0.0050	mg/L	2024-10-10	
Phosphorus, Dissolved Reactive	**0.410**	0.0050	mg/L	2024-10-09	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-10-11	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**155000**	1	MPN/100 mL	2024-10-07	
Coliforms, Fecal (Q-Tray)	**22500**	1	MPN/100 mL	2024-10-07	
Duplicate (24J0927-02) | Matrix: Wastewater | Sampled: 2024-10-07 10:50					
Anions					
Chloride	**130**	0.10	mg/L	2024-10-08	
Nitrate (as N)	**1.99**	0.010	mg/L	2024-10-08	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-10-08	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.99**	0.0100	mg/L	N/A	
Nitrogen, Total	**4.55**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.64**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**165**	1.0	mg/L	2024-10-10	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-10-10	
Alkalinity, Bicarbonate (as CaCO3)	**165**	1.0	mg/L	2024-10-10	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-10-10	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0927
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-15 09:38

Analyte	Result	RL	Units	Analyzed	Qualifier
Duplicate (24J0927-02) | Matrix: Wastewater | Sampled: 2024-10-07 10:50, Continued					
General Parameters, Continued					
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-10-10	
Ammonia, Total (as N)	**0.917**	0.050	mg/L	2024-10-10	
BOD, 5-day Carbonaceous	< 3.2	2.0	mg/L	2024-10-14	
Nitrogen, Total Kjeldahl	**2.56**	0.050	mg/L	2024-10-11	
pH	**7.94**	0.10	pH units	2024-10-10	HT2
Phosphorus, Total (as P)	**0.652**	0.0050	mg/L	2024-10-10	
Phosphorus, Dissolved Reactive	**0.380**	0.0050	mg/L	2024-10-09	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-10-11	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**199000**	1	MPN/100 mL	2024-10-07	
Coliforms, Fecal (Q-Tray)	**31300**	1	MPN/100 mL	2024-10-07	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0927
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-15 09:38

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0927
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-15 09:38

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4J2334										
Blank (B4J2334-BLK1)				Prepared: 2024-10-08, Analyzed: 2024-10-08						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4J2334-BS1)				Prepared: 2024-10-08, Analyzed: 2024-10-08						
Chloride	15.8	0.10	mg/L	16.0		99	90-110			
Nitrate (as N)	4.11	0.010	mg/L	4.00		103	90-110			
Nitrite (as N)	2.04	0.010	mg/L	2.00		102	85-115			
General Parameters, Batch B4J2426										
Blank (B4J2426-BLK1)				Prepared: 2024-10-08, Analyzed: 2024-10-09						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4J2426-BS1)				Prepared: 2024-10-08, Analyzed: 2024-10-09						
Phosphorus, Dissolved Reactive	0.104	0.0050	mg/L	0.100		104	84-115			
General Parameters, Batch B4J2602										
Blank (B4J2602-BLK1)				Prepared: 2024-10-09, Analyzed: 2024-10-14						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4J2602-BS1)				Prepared: 2024-10-09, Analyzed: 2024-10-14						
BOD, 5-day Carbonaceous	215	53.1	mg/L	198		109	85-115			
General Parameters, Batch B4J2660										
Blank (B4J2660-BLK1)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4J2660-BLK2)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4J2660-BLK3)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0927
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-15 09:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4J2660, Continued										
LCS (B4J2660-BS1)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	0.100	0.0050	mg/L	0.100		100	85-115			
LCS (B4J2660-BS2)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	0.103	0.0050	mg/L	0.100		103	85-115			
LCS (B4J2660-BS3)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	0.101	0.0050	mg/L	0.100		101	85-115			
General Parameters, Batch B4J2665										
Blank (B4J2665-BLK1)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4J2665-BLK2)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4J2665-BLK3)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4J2665-BLK4)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4J2665-BLK5)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4J2665-BS1)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	85-115			
LCS (B4J2665-BS2)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	0.996	0.050	mg/L	1.00		100	85-115			
LCS (B4J2665-BS3)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4J2665-BS4)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4J2665-BS5)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	1.06	0.050	mg/L	1.00		106	85-115			
Duplicate (B4J2665-DUP4)		**Source: 24J0927-01**		Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	0.918	0.050	mg/L		0.908			1	15	
Matrix Spike (B4J2665-MS4)		**Source: 24J0927-01**		Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	1.16	0.050	mg/L	0.204	0.908	124	75-125			
General Parameters, Batch B4J2692										
Blank (B4J2692-BLK1)				Prepared: 2024-10-10, Analyzed: 2024-10-11						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4J2692-BS1)				Prepared: 2024-10-10, Analyzed: 2024-10-11						
Solids, Total Suspended	94.0	5.0	mg/L	100		94	85-115			
General Parameters, Batch B4J2767										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0927
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-15 09:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4J2767, Continued										
Blank (B4J2767-BLK1)				Prepared: 2024-10-10, Analyzed: 2024-10-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4J2767-BLK2)				Prepared: 2024-10-10, Analyzed: 2024-10-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4J2767-BS1)				Prepared: 2024-10-10, Analyzed: 2024-10-11						
Nitrogen, Total Kjeldahl	1.00	0.050	mg/L	1.00		100	85-115			
LCS (B4J2767-BS2)				Prepared: 2024-10-10, Analyzed: 2024-10-11						
Nitrogen, Total Kjeldahl	0.996	0.050	mg/L	1.00		100	85-115			
General Parameters, Batch B4J2803										
Blank (B4J2803-BLK1)				Prepared: 2024-10-11, Analyzed: 2024-10-11						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4J2803-BS1)				Prepared: 2024-10-11, Analyzed: 2024-10-11						
Solids, Total Suspended	96.0	5.0	mg/L	100		96	85-115			
General Parameters, Batch B4J2816										
Blank (B4J2816-BLK1)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4J2816-BLK2)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4J2816-BLK3)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4J2816-BS1)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	91.1	1.0	mg/L	100		91	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	42.3	1.0	mg/L	50.0		85	0-200			
LCS (B4J2816-BS3)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	91.3	1.0	mg/L	100		91	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	42.6	1.0	mg/L	50.0		85	0-200			
LCS (B4J2816-BS5)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	91.7	1.0	mg/L	100		92	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	41.5	1.0	mg/L	50.0		83	0-200			
Reference (B4J2816-SRM1)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
pH	7.02	0.10	pH units	7.01		100	98-102			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0927
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-15 09:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4J2816, Continued										
Reference (B4J2816-SRM2)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
pH	7.01	0.10	pH units	7.01		100	98-102			
Reference (B4J2816-SRM3)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
pH	7.02	0.10	pH units	7.01		100	98-102			
Microbiological Parameters, Batch B4J2327										
Blank (B4J2327-BLK1)				Prepared: 2024-10-07, Analyzed: 2024-10-07						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4J2327-BLK2)				Prepared: 2024-10-07, Analyzed: 2024-10-07						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Duplicate (B4J2327-DUP2)			**Source: 24J0927-01**	Prepared: 2024-10-07, Analyzed: 2024-10-07						
Coliforms, Fecal (Q-Tray)	21900	1	MPN/100 mL		22500			3	80	

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24J0883
PO NUMBER		**RECEIVED / TEMP**	2024-10-07 12:00 / 17.6°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-15 10:03
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45572.35282

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0883
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-15 10:03

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (24J0883-01) | Matrix: Wastewater | Sampled: 2024-10-07 10:20					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2024-10-08	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-10-08	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**120**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**429**	1.0	mg/L	2024-10-10	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-10-10	
Alkalinity, Bicarbonate (as CaCO3)	**429**	1.0	mg/L	2024-10-10	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-10-10	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-10-10	
Ammonia, Total (as N)	**77.9**	0.050	mg/L	2024-10-10	
BOD, 5-day	**650**	2.0	mg/L	2024-10-14	
BOD, 5-day Carbonaceous	**423**	2.0	mg/L	2024-10-14	
Nitrogen, Total Kjeldahl	**120**	0.050	mg/L	2024-10-11	
pH	**8.09**	0.10	pH units	2024-10-10	HT2
Phosphorus, Total (as P)	**15.2**	0.0050	mg/L	2024-10-10	
Phosphorus, Dissolved Reactive	**6.32**	0.0050	mg/L	2024-10-09	
Solids, Total Suspended	**380**	2.0	mg/L	2024-10-11	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0883
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-15 10:03

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0883
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-15 10:03

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4J2334										
Blank (B4J2334-BLK1)				Prepared: 2024-10-08, Analyzed: 2024-10-08						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4J2334-BS1)				Prepared: 2024-10-08, Analyzed: 2024-10-08						
Nitrate (as N)	4.11	0.010	mg/L	4.00		103	90-110			
Nitrite (as N)	2.04	0.010	mg/L	2.00		102	85-115			
General Parameters, Batch B4J2426										
Blank (B4J2426-BLK1)				Prepared: 2024-10-08, Analyzed: 2024-10-09						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4J2426-BS1)				Prepared: 2024-10-08, Analyzed: 2024-10-09						
Phosphorus, Dissolved Reactive	0.104	0.0050	mg/L	0.100		104	84-115			
General Parameters, Batch B4J2602										
Blank (B4J2602-BLK1)				Prepared: 2024-10-09, Analyzed: 2024-10-14						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4J2602-BS1)				Prepared: 2024-10-09, Analyzed: 2024-10-14						
BOD, 5-day Carbonaceous	215	53.1	mg/L	198		109	85-115			
General Parameters, Batch B4J2603										
Blank (B4J2603-BLK1)				Prepared: 2024-10-09, Analyzed: 2024-10-14						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B4J2603-BS1)				Prepared: 2024-10-09, Analyzed: 2024-10-14						
BOD, 5-day	227	48.4	mg/L	198		115	85-115			
General Parameters, Batch B4J2660										
Blank (B4J2660-BLK1)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0883
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-15 10:03

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4J2660, Continued										
Blank (B4J2660-BLK1), Continued				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Blank (B4J2660-BLK2)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4J2660-BLK3)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4J2660-BS1)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	0.100	0.0050	mg/L	0.100		100	85-115			
LCS (B4J2660-BS2)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	0.103	0.0050	mg/L	0.100		103	85-115			
LCS (B4J2660-BS3)				Prepared: 2024-10-09, Analyzed: 2024-10-10						
Phosphorus, Total (as P)	0.101	0.0050	mg/L	0.100		101	85-115			
General Parameters, Batch B4J2665										
Blank (B4J2665-BLK1)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4J2665-BLK2)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4J2665-BLK3)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4J2665-BLK4)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4J2665-BLK5)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4J2665-BS1)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	85-115			
LCS (B4J2665-BS2)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	0.996	0.050	mg/L	1.00		100	85-115			
LCS (B4J2665-BS3)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4J2665-BS4)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4J2665-BS5)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Ammonia, Total (as N)	1.06	0.050	mg/L	1.00		106	85-115			
General Parameters, Batch B4J2767										
Blank (B4J2767-BLK1)				Prepared: 2024-10-10, Analyzed: 2024-10-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B4J2767-BLK2)				Prepared: 2024-10-10, Analyzed: 2024-10-11						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0883
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-15 10:03

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4J2767, Continued										
LCS (B4J2767-BS1)				Prepared: 2024-10-10, Analyzed: 2024-10-11						
Nitrogen, Total Kjeldahl	1.00	0.050	mg/L	1.00		100	85-115			
LCS (B4J2767-BS2)				Prepared: 2024-10-10, Analyzed: 2024-10-11						
Nitrogen, Total Kjeldahl	0.996	0.050	mg/L	1.00		100	85-115			
General Parameters, Batch B4J2803										
Blank (B4J2803-BLK1)				Prepared: 2024-10-11, Analyzed: 2024-10-11						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B4J2803-BS1)				Prepared: 2024-10-11, Analyzed: 2024-10-11						
Solids, Total Suspended	96.0	5.0	mg/L	100		96	85-115			
General Parameters, Batch B4J2816										
Blank (B4J2816-BLK1)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4J2816-BLK2)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B4J2816-BLK3)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4J2816-BS1)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	91.1	1.0	mg/L	100		91	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	42.3	1.0	mg/L	50.0		85	0-200			
LCS (B4J2816-BS3)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	91.3	1.0	mg/L	100		91	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	42.6	1.0	mg/L	50.0		85	0-200			
LCS (B4J2816-BS5)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
Alkalinity, Total (as CaCO3)	91.7	1.0	mg/L	100		92	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	41.5	1.0	mg/L	50.0		83	0-200			
Reference (B4J2816-SRM1)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
pH	7.02	0.10	pH units	7.01		100	98-102			
Reference (B4J2816-SRM2)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
pH	7.01	0.10	pH units	7.01		100	98-102			
Reference (B4J2816-SRM3)				Prepared: 2024-10-10, Analyzed: 2024-10-10						
pH	7.02	0.10	pH units	7.01		100	98-102			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24J0883
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-15 10:03

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24I2857
PO NUMBER		**RECEIVED / TEMP**	2024-09-23 11:20 / 17.5°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-01 15:21
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45558.39934

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24I2857
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-01 15:21

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (24I2857-01) | Matrix: Wastewater | Sampled: 2024-09-23 08:50					
Anions					
Chloride	**134**	0.10	mg/L	2024-09-24	
Nitrate (as N)	**0.829**	0.010	mg/L	2024-09-24	
Nitrite (as N)	**0.177**	0.010	mg/L	2024-09-24	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.01**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.15**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.51**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**169**	1.0	mg/L	2024-09-26	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-09-26	
Alkalinity, Bicarbonate (as CaCO3)	**169**	1.0	mg/L	2024-09-26	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-09-26	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-09-26	
Ammonia, Total (as N)	**2.63**	0.050	mg/L	2024-09-25	
BOD, 5-day Carbonaceous	< 3.7	2.0	mg/L	2024-10-01	
Nitrogen, Total Kjeldahl	**4.14**	0.050	mg/L	2024-09-28	
pH	**7.87**	0.10	pH units	2024-09-26	HT2
Phosphorus, Total (as P)	**1.24**	0.0050	mg/L	2024-09-26	
Phosphorus, Dissolved Reactive	**1.00**	0.0050	mg/L	2024-09-25	RE2
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-10-01	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	**173000**	1	MPN/100 mL	2024-09-24	
Coliforms, Fecal (Q-Tray)	**19700**	1	MPN/100 mL	2024-09-24	
Trip Blank (24I2857-02) | Matrix: Wastewater | Sampled: 2024-09-23					
Anions					
Chloride	< 0.10	0.10	mg/L	2024-09-24	
Nitrate (as N)	< 0.010	0.010	mg/L	2024-09-24	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-09-24	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2024-09-26	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-09-26	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-09-26	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-09-26	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24I2857
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-01 15:21

Analyte	Result	RL	Units	Analyzed	Qualifier
Trip Blank (24I2857-02) | Matrix: Wastewater | Sampled: 2024-09-23, Continued					
General Parameters, Continued					
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-09-26	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2024-09-25	
BOD, 5-day Carbonaceous	< 3.7	2.0	mg/L	2024-10-01	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2024-09-28	
pH	**5.76**	0.10	pH units	2024-09-26	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2024-09-26	
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L	2024-09-25	
Solids, Total Suspended	< 2.0	2.0	mg/L	2024-10-01	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2024-09-24	HT4
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2024-09-24	HT4

Sample Qualifiers:

HT2	The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
HT4	The collection date and/or time was not provided. Therefore holding time exceedances cannot be properly identified.
RE2	Result was confirmed by re-analysis prior to reporting.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24I2857
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-01 15:21

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24I2857
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-01 15:21

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4I3857										
Blank (B4I3857-BLK1)				Prepared: 2024-09-24, Analyzed: 2024-09-24						
Chloride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4I3857-BS1)				Prepared: 2024-09-24, Analyzed: 2024-09-24						
Chloride	16.0	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	3.81	0.010	mg/L	4.00		95	90-110			
Nitrite (as N)	2.14	0.010	mg/L	2.00		107	85-115			
General Parameters, Batch B4I3925										
Blank (B4I3925-BLK1)				Prepared: 2024-09-24, Analyzed: 2024-09-25						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4I3925-BS1)				Prepared: 2024-09-24, Analyzed: 2024-09-25						
Phosphorus, Dissolved Reactive	0.0950	0.0050	mg/L	0.100		95	84-115			
General Parameters, Batch B4I3980										
Blank (B4I3980-BLK1)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4I3980-BLK2)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4I3980-BLK3)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4I3980-BS1)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4I3980-BS2)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4I3980-BS3)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24I2857
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-01 15:21

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4I3980, Continued										
Duplicate (B4I3980-DUP2)	**Source: 24I2857-01**			Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	2.62	0.050	mg/L		2.63			< 1	15	
Matrix Spike (B4I3980-MS2)	**Source: 24I2857-01**			Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	2.77	0.050	mg/L	0.204	2.63	65	75-125			MS2
General Parameters, Batch B4I4136										
Blank (B4I4136-BLK1)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4I4136-BS1)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Alkalinity, Total (as CaCO3)	93.9	1.0	mg/L	100		94	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	47.9	1.0	mg/L	50.0		96	0-200			
Reference (B4I4136-SRM1)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
pH	7.02	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4I4137										
Blank (B4I4137-BLK1)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4I4137-BLK2)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4I4137-BLK3)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4I4137-BS1)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	0.103	0.0050	mg/L	0.100		103	85-115			
LCS (B4I4137-BS2)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	0.104	0.0050	mg/L	0.100		104	85-115			
LCS (B4I4137-BS3)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
General Parameters, Batch B4I4200										
Blank (B4I4200-BLK1)				Prepared: 2024-09-26, Analyzed: 2024-10-01						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4I4200-BS1)				Prepared: 2024-09-26, Analyzed: 2024-10-01						
BOD, 5-day Carbonaceous	214	61.8	mg/L	198		108	85-115			
General Parameters, Batch B4I4359										
Blank (B4I4359-BLK1)				Prepared: 2024-09-27, Analyzed: 2024-09-28						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24I2857
PROJECT	Final Effluent- PE14651	**REPORTED**	2024-10-01 15:21

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4I4359, Continued										
Blank (B4I4359-BLK2)				Prepared: 2024-09-27, Analyzed: 2024-09-28						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4I4359-BS1)				Prepared: 2024-09-27, Analyzed: 2024-09-28						
Nitrogen, Total Kjeldahl	0.981	0.050	mg/L	1.00		98	85-115			
LCS (B4I4359-BS2)				Prepared: 2024-09-27, Analyzed: 2024-09-28						
Nitrogen, Total Kjeldahl	0.977	0.050	mg/L	1.00		98	85-115			
General Parameters, Batch B4I4417										
Blank (B4I4417-BLK1)				Prepared: 2024-09-28, Analyzed: 2024-10-01						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Reference (B4I4417-SRM1)				Prepared: 2024-09-28, Analyzed: 2024-10-01						
Solids, Total Suspended	432	20.0	mg/L	459		94	80-120			
Microbiological Parameters, Batch B4I3868										
Blank (B4I3868-BLK1)				Prepared: 2024-09-24, Analyzed: 2024-09-24						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4I3868-BLK2)				Prepared: 2024-09-24, Analyzed: 2024-09-24						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4I3868-BLK3)				Prepared: 2024-09-24, Analyzed: 2024-09-24						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4I3868-BLK4)				Prepared: 2024-09-24, Analyzed: 2024-09-24						
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL							
Blank (B4I3868-BLK5)				Prepared: 2024-09-24, Analyzed: 2024-09-24						
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL							
Duplicate (B4I3868-DUP2)				**Source: 24I2857-01** Prepared: 2024-09-24, Analyzed: 2024-09-24						
Coliforms, Fecal (Q-Tray)	17800	1	MPN/100 mL		19700			10	80	

QC Qualifiers:

MS2 The native sample concentration is greater than the spike concentration hence the matrix spike limits do not apply.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	24I2856
PO NUMBER		**RECEIVED / TEMP**	2024-09-23 11:20 / 17.5°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-01 15:08
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	45558.39934

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: https://www.caro.ca/terms-conditions

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24I2856
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-01 15:08

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (24I2856-01) | Matrix: Wastewater | Sampled: 2024-09-23 10:05					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2024-09-24	
Nitrite (as N)	< 0.010	0.010	mg/L	2024-09-24	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**114**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**408**	1.0	mg/L	2024-09-26	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-09-26	
Alkalinity, Bicarbonate (as CaCO3)	**408**	1.0	mg/L	2024-09-26	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-09-26	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-09-26	
Ammonia, Total (as N)	**78.4**	0.050	mg/L	2024-09-25	
BOD, 5-day	**315**	2.0	mg/L	2024-10-01	
BOD, 5-day Carbonaceous	**372**	2.0	mg/L	2024-10-01	
Nitrogen, Total Kjeldahl	**114**	0.050	mg/L	2024-09-28	
pH	**7.86**	0.10	pH units	2024-09-26	HT2
Phosphorus, Total (as P)	**14.1**	0.0050	mg/L	2024-09-26	
Phosphorus, Dissolved Reactive	**7.22**	0.0050	mg/L	2024-09-25	
Solids, Total Suspended	**332**	2.0	mg/L	2024-10-01	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24I2856
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-01 15:08

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2019)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Dissolved Reactive in Water	SM 4500-P F (2021)	Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	Solids in Water, Filtered / SM 2540 D* (2020)	Solids in Water, Filtered / Gravimetry (Dried at 103-105C)	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the received samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Caro will dispose of all samples within 30 days of sample receipt, unless otherwise agreed.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline(s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24I2856
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-01 15:08

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B4I3857										
Blank (B4I3857-BLK1)				Prepared: 2024-09-24, Analyzed: 2024-09-24						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
LCS (B4I3857-BS1)				Prepared: 2024-09-24, Analyzed: 2024-09-24						
Nitrate (as N)	3.81	0.010	mg/L	4.00		95	90-110			
Nitrite (as N)	2.14	0.010	mg/L	2.00		107	85-115			
General Parameters, Batch B4I3925										
Blank (B4I3925-BLK1)				Prepared: 2024-09-24, Analyzed: 2024-09-25						
Phosphorus, Dissolved Reactive	< 0.0050	0.0050	mg/L							
LCS (B4I3925-BS1)				Prepared: 2024-09-24, Analyzed: 2024-09-25						
Phosphorus, Dissolved Reactive	0.0950	0.0050	mg/L	0.100		95	84-115			
General Parameters, Batch B4I3980										
Blank (B4I3980-BLK1)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4I3980-BLK2)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B4I3980-BLK3)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B4I3980-BS1)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4I3980-BS2)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			
LCS (B4I3980-BS3)				Prepared: 2024-09-25, Analyzed: 2024-09-25						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24I2856
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-01 15:08

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4I4136										
Blank (B4I4136-BLK1)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B4I4136-BS1)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Alkalinity, Total (as CaCO3)	93.9	1.0	mg/L	100		94	80-120			
Alkalinity, Phenolphthalein (as CaCO3)	47.9	1.0	mg/L	50.0		96	0-200			
Reference (B4I4136-SRM1)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
pH	7.02	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B4I4137										
Blank (B4I4137-BLK1)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4I4137-BLK2)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B4I4137-BLK3)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B4I4137-BS1)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	0.103	0.0050	mg/L	0.100		103	85-115			
LCS (B4I4137-BS2)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	0.104	0.0050	mg/L	0.100		104	85-115			
LCS (B4I4137-BS3)				Prepared: 2024-09-26, Analyzed: 2024-09-26						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
General Parameters, Batch B4I4200										
Blank (B4I4200-BLK1)				Prepared: 2024-09-26, Analyzed: 2024-10-01						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B4I4200-BS1)				Prepared: 2024-09-26, Analyzed: 2024-10-01						
BOD, 5-day Carbonaceous	214	61.8	mg/L	198		108	85-115			
General Parameters, Batch B4I4201										
Blank (B4I4201-BLK1)				Prepared: 2024-09-26, Analyzed: 2024-10-01						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B4I4201-BS1)				Prepared: 2024-09-26, Analyzed: 2024-10-01						
BOD, 5-day	215	49.0	mg/L	198		109	85-115			
General Parameters, Batch B4I4359										
Blank (B4I4359-BLK1)				Prepared: 2024-09-27, Analyzed: 2024-09-28						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	24I2856
PROJECT	Raw Influent- PE14651	**REPORTED**	2024-10-01 15:08

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B4I4359, Continued										
Blank (B4I4359-BLK2)				Prepared: 2024-09-27, Analyzed: 2024-09-28						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B4I4359-BS1)				Prepared: 2024-09-27, Analyzed: 2024-09-28						
Nitrogen, Total Kjeldahl	0.981	0.050	mg/L	1.00		98	85-115			
LCS (B4I4359-BS2)				Prepared: 2024-09-27, Analyzed: 2024-09-28						
Nitrogen, Total Kjeldahl	0.977	0.050	mg/L	1.00		98	85-115			
General Parameters, Batch B4I4417										
Blank (B4I4417-BLK1)				Prepared: 2024-09-28, Analyzed: 2024-10-01						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Reference (B4I4417-SRM1)				Prepared: 2024-09-28, Analyzed: 2024-10-01						
Solids, Total Suspended	432	20.0	mg/L	459		94	80-120			

Appendix C – Non-Compliance Reporting

MINISTRY OF ENVIRONMENT
REGIONAL OPERATIONS BRANCH

NON-COMPLIANCE REPORTING MAILBOX NOTIFICATION TEMPLATE

To: EnvironmentalCompliance@gov.bc.ca

Subject: 2025-01-15 Authorization #14651 Ortho phosphorus annual average exceedance

Attention:

Non-compliance Report for Authorization # 14651
Ortho P annual average for 2024 exceedance

Date of Non-compliance: 2024

Location of Non-compliance [4062 Beaver Lake Rd 50.024865, -119.385069]:

Nature of Non-compliance: As per section 1.1.3 of the Operational Certificate #14651, the maximum annual average for Ortho Phosphorus(as P) is 0.15 mg/l. The accredited lab results for 2024 came back with an annual average of 0.32 mg/l Ortho-P(measured as P).

Causes: Since the recent upgrade in Fall of 2023**,** and despite better overall treatment and a more consistent effluent quality, there has been a general higher than normal Ortho-P in effluent lab results. The District of Lake Country has contracted AEcom to look into the reasons for this, and the general consensus is that with the additional nutrient loading from the Septage receiving station, the plant is unable treat this to the required standard.

Future action items: The District of Lake Country does not use chemicals in its wastewater treatment process. The common practice to use coagulants has not been adopted due to the fact the facility utilizes effluent disposal to ground and there have been concerns that these chemicals might negatively impact the subsurface disposal system. This has not been proved and could be the solution to this issue.

This should read 10x

The septage to the facility has been determined to add up to 100x the nutrient loading at times, and while there are ways to mitigate this, there are cost and contractual obligations that are prohibitive.

Current upgrades to the sludge storage aeration system we hope will prevent phosphorus from releasing during the centrifuging process and allow phosphorus to remain in the plant waste solids.

Possible use of chemicals in the future, and additional storage of high strength septage waste could be other ways to improve effluent ortho p results.

Contact information: Davin Larsen 250-869-5703 or dlarsen@lakecountry.bc.ca

Attachments: Table of accredited results for 2024

Appendix D - Groundwater Monitoring Report

Memorandum

Date:	March 4, 2025
To:	Sarah Graham, District of Lake Country
cc:	Davin Larsen, AScT., District of Lake Country
From:	Dr. Joanne Quarmby, R.P.Bio
File:	OC 14651
Subject:	Review of 2024 Groundwater Data – Centralised Plant

1. Introduction

Groundwater monitoring is required as part of the operational certificate (#14651). The monitoring requirements are outlined in Section 3.2 of the operational certificate, and are summarised in Table 1.1, below. The groundwater monitoring program is implemented by District staff, with the analyses being completed at an accredited laboratory. Conductance and pH are to be field measurements. The location of the various wells can be found in the attached figure. As per the amended operational certificate, dated October 8th, 2024, monitoring of the privately-owned well H6 is no longer required. This site is no longer accessible and the home is no longer occupied, as the property is now an industrial marijuana operation with high security.

Table 1.1: Groundwater Monitoring Program

Site	Description	Monitoring Scope	
		Groundwater Depth	Water Quality
MW-2	Background (up-gradient) well	Monthly	Once in the spring and fall for the following parameters: sodium, chloride, conductance, ammonia, nitrate/nitrite, TKN, total nitrogen, total phosphorus, orthophosphorus, pH and *E. coli*.
MW-18	Down-gradient within treatment plant boundary	Continuous	
MW-10	Down-gradient near treatment plant boundary	Continuous	
MW-12	Down-gradient near treatment plant boundary	Continuous	
MW-14	Down-gradient, by Lodge Road	Monthly	
H1	10050 McCarthy Road	Not required	
H2	10101A Konschuh Road		
H3	9989 Bottom Wood Lake Road		
H4	10101B Konschuh Road		
H5	9815 McCarthy Road		
H7	9991 McCarthy Road		

Reporting of the groundwater data is a requirement of the operational certificate. Section 4.4(b) of the operational certificate indicates that the annual report is to include a review and interpretation of the discharge and groundwater monitoring and flow data for the preceding year. This memorandum has been prepared in order to address Section 4.4(b) of the permit with respect to the groundwater data only.

2. Groundwater Levels

The District provided data relating to groundwater levels in a summarised and tabulated form.

Figure 2.1 shows the monthly groundwater levels for the 5 monitoring wells. There are no data available for MW-2 in December. This monitoring well is located at a gravel pit and the gated access is often locked in the winter months if the site is not in operation, as was the case for December 2024. As with data from previous years, the highest groundwater levels continue to be observed consistently at MW-10, located down-gradient near the plant boundary, with the lowest groundwater levels continuing to be observed at MW-18 (down-gradient within the plant boundary) and MW-12 (down-gradient outside of the plant boundary, just beyond MW10). There was no trend of decreasing groundwater levels with an increasing distance from the infiltration facilities. Slight variations in the groundwater levels were observed in all wells through the year, with the greatest variations being observed in MW-14, located furthest away from the wastewater treatment plant. As with data from previous years, there was a decrease in the water level for MW-14 during the summer months, with the lowest level being measured in August. All data points indicated that the distance to the groundwater level was over 0.5 m from the ground surface. This depth is not a requirement of the operational certificate but is taken from the Municipal Wastewater Regulation for a minimum unsaturated soil depth for a Class A or B effluent.

Figure 2.1: Groundwater Levels – Monthly Readings

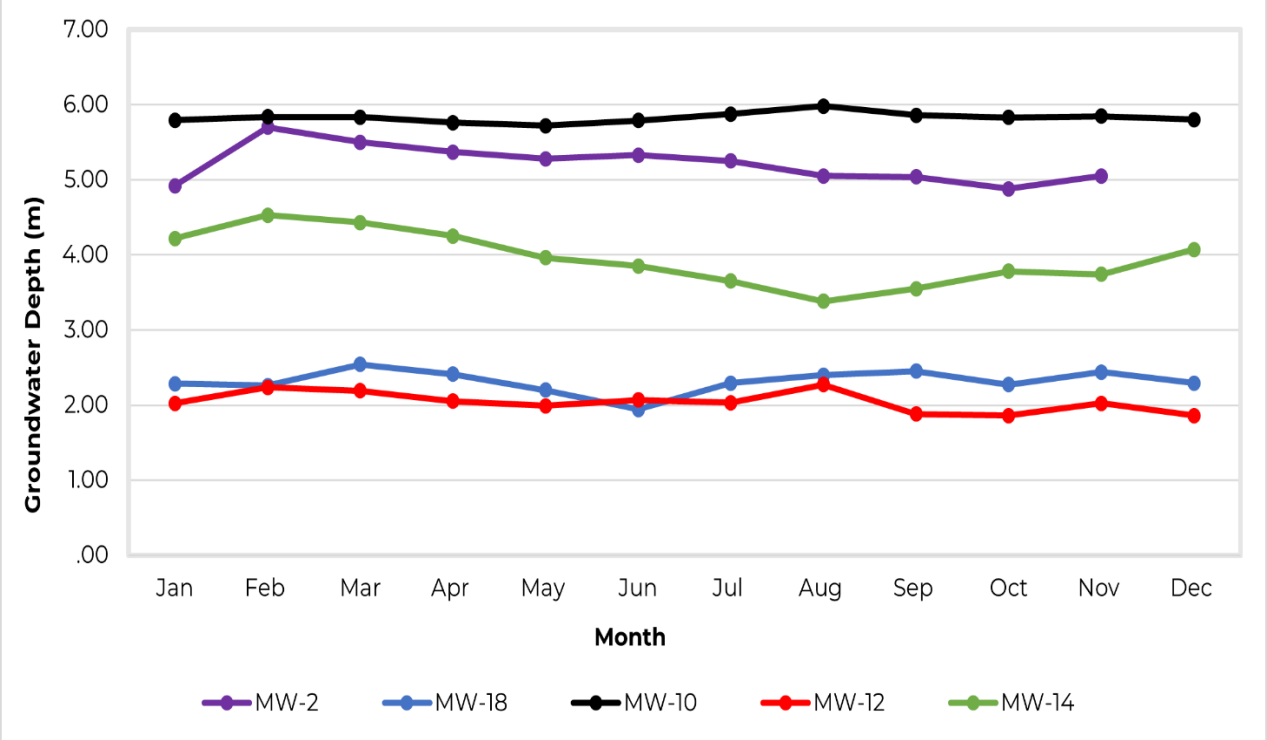
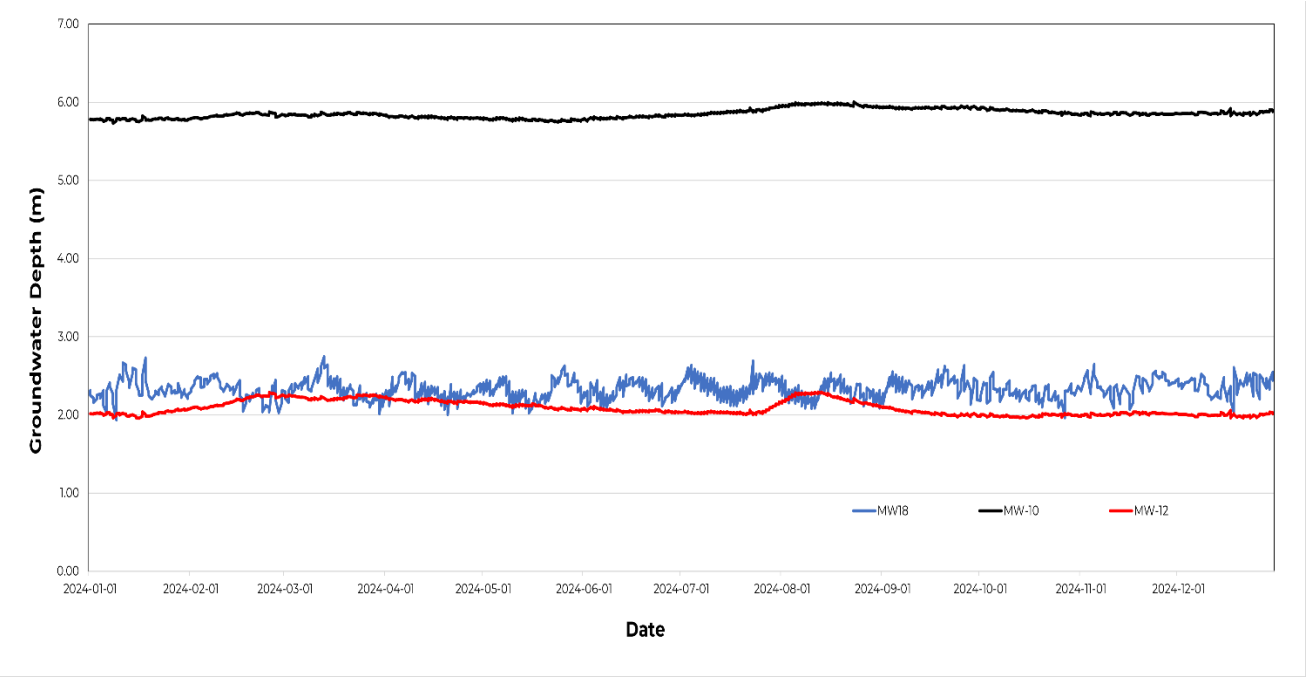


Figure 2.2. shows the water level data from the data loggers in MW-18, MW-10 and MW-12. As with the monthly data, the information from the data loggers indicate that the highest groundwater levels were observed consistently at MW-10, with similarity in the groundwater levels for MW-18 and MW-12. There is also a similarity in the trends throughout the year for all wells when compared with the monthly data. All data points indicated that the distance to the groundwater level was over 0.5 m from the ground surface. This depth is not a requirement of the operational certificate but is taken from the Municipal Wastewater Regulation for a minimum unsaturated soil depth for a Class A or B effluent.

Figure 2.2: Groundwater Levels – Data Logger Readings



3. Groundwater quality

3.1 District-owned Wells

The District provided the original laboratory reports for review and interpretation. The concentration of organic nitrogen was calculated using the Total Kjeldahl Nitrogen (TKN) and ammonia data, with half the detection limit being used where the data were reported to be below the analytical detection limit. The spring samples were taken on April 23rd and the fall samples were taken on October 3rd.

Table 3.1 summarises the spring data. Should an influence be observed from the effluent release, the expectation is that the lowest concentrations should be associated with the background well MW-2 and that the highest concentrations should be observed at MW-18 or MW-10, decreasing at MW-14 as a result of assimilation, rejuvenation and dilution as the effluent moves through the ground. Parameters which could be used to indicate the presence of effluent from the wastewater plant could include total nitrogen, nitrate, orthophosphorus, sodium, chloride, conductivity and *E. coli*. However, nitrate could be influenced from

agricultural inputs, phosphorus can bind readily to soils, *E. coli* could be removed/die-off as the effluent passes through the soils, and sodium, chloride and conductivity could be present as a result of other inputs, such as road maintenance activities. The data indicate that the highest concentrations tended to be associated with MW-18, although this is not always the case, with total nitrogen and nitrate being higher in MW-10, and ammonia and conductivity being higher at MW-14, the furthest down-gradient well. The lowest concentrations tended to be associated with MW-2, with the exception of total nitrogen and nitrate, which were lower in MW-14. The concentrations of nitrite and *E. coli* were below the analytical detection limit regardless of location, with ammonia being below the analytical detection limit in all wells except MW-14.

Focusing on nitrate as the possible best tracer for the presence of effluent from the District's discharge, the concentrations at MW-18, MW-10 and MW-12 were higher than that in the background well MW-2, with the highest concentration being in MW-10. The concentration decreased at MW-14, with the reported concentration being below the analytical detection limit. This general trend is relatively consistent with data from previous years.

Table 3.1: Summary of Spring Data

Parameter	Units	Location				
		MW-2	MW-18	MW-10	MW-12	MW-14
Total Nitrogen	mg/L	1.08	2.60	2.68	2.10	0.186
TKN	mg/L	< 0.050	0.406	0.167	0.199	0.186
Organic Nitrogen	mg/L	< 0.050	0.381	0.142	0.174	0.085
Ammonia	mg/L	< 0.050	< 0.050	< 0.050	< 0.050	0.101
Nitrate	mg/L	1.08	2.19	2.51	1.90	< 0.010
Nitrite	mg/L	< 0.010	< 0.010	<0.010	< 0.010	< 0.100
Total Phosphorus	mg/L	0.0071	0.0869	0.0261	0.0450	0.0778
Orthophosphorus	mg/L	< 0.0050	0.0650	0.0170	0.0200	0.0330
Sodium	mg/L	17.1	94.0	72.7	83.7	64.4
Chloride	mg/L	8.57	126	112	120	101
Conductivity	µS/cm	450	895	865	878	955
pH	pH units	7.79	7.66	7.72	7.70	7.75
E. coli	MPN/100 mL	< 1	< 1	< 1	< 1	< 1

Table 3.2 summarises the fall data. As with the spring data, it is reasonable to assume that an influence from the effluent release should translate to the lowest concentrations being associated with the background well MW-2, and the highest concentrations being associated with the closest down-gradient wells (MW-18 and/or MW-10), then decreasing at MW-14 as a result of assimilation, rejuvenation and

dilution as the effluent moves through the ground. As with the spring data, the highest concentrations tended to be associated with MW-18, with the highest concentrations for nitrate and nitrite being associated with MW-12. There were no occasions where the highest concentrations were associated with MW-10. As with the spring data, ammonia and conductivity were the highest at MW-14. The lowest concentrations continued to be associated with MW-2, again with the exception of total nitrogen and nitrate, which were lower in MW-14. Nitrite was below the analytical detection limit for all monitoring wells apart from MW-12, and *E. coli* was below the analytical detection limit for all monitoring wells apart MW-14, where the concentration was just above the analytical detection limit.

Given the same assumptions for the parameters of most interest, focusing on nitrate, the concentration continued to be elevated above the background well at MW-18, MW-10 and MW-12, with the highest concentration being at MW-12. The higher concentrations at these three wells is consistent with observations from previous years. As with the spring data, the concentration decreased at MW-14 and was below the analytical detection limit. This general trend is relatively consistent with data from previous years.

Table 3.2: Summary of Fall Data

Parameter	Units	Location				
		MW-2	MW-18	MW-10	MW-12	MW-14
Total Nitrogen	mg/L	1.15	3.35	2.77	3.27	0.255
TKN	mg/L	< 0.050	0.389	0.198	0.262	0.255
Organic Nitrogen	mg/L	< 0.050	0.317	0.173	0.237	0.147
Ammonia	mg/L	< 0.050	0.072	< 0.050	< 0.050	0.108
Nitrate	mg/L	1.15	2.96	2.57	3.00	< 0.010
Nitrite	mg/L	< 0.010	< 0.010	< 0.010	0.014	< 0.010
Total Phosphorus	mg/L	0.0121	0.179	0.0310	0.0400	0.0950
Orthophosphorus	mg/L	< 0.0050	0.0890	0.0170	0.0200	0.0180
Sodium	mg/L	16.3	90.8	71.5	86.2	72.7
Chloride	mg/L	9.33	138	116	138	137
Conductivity	µS/cm	462	938	924	955	1,170
pH	pH units	8.01	7.87	7.94	7.94	7.86
E. coli	MPN/100 mL	< 1	< 1	< 1	< 1	2

The water quality was compared with the BC Water Quality Guidelines, focusing on groundwater uses for the most stringent of either potable or agricultural purposes, given the distance from surface water. The parameters where guidelines exist and are also of possible interest with respect to the District's effluent and public health or environmental impacts are: nitrate, chloride, conductivity, pH and *E. coli*. The outcomes

are summarised in Table 3.3, with green indicating concentrations below the guideline and red indicating that at least 1 data point was above the guideline. The guideline for conductivity for irrigation is crop dependent and varies depending on the crop tolerance. The guideline ranges from 700 µS/cm for the most sensitive crops to 5,000 µS/cm for least sensitive crops. For the purpose of this assessment, a moderately tolerant crop was selected, as this type of crop also includes grasses which are expected to be a common vegetation for the general area. For *E. coli*, there were several guidelines which range from absence up to ≤ 1,000 CFU/100 mL (general irrigation). Selection of the most stringent guideline may not be the best representative of water quality, given that it does not allow for any *E. coli* to be present and assumes that there is no disinfection of what is expected to be untreated water.

Table 3.3: Guideline Comparison

Parameter	Units	Guideline	Location				
			MW-2	MW-18	MW-10	MW-12	MW-14
Nitrate	mg/L	≤ 10 (drinking water)					
Chloride	mg/L	100 (irrigation)					
Conductivity	µS/cm	2,200 (irrigation)					
pH	pH units	5.0 to 9.5 (irrigation)					
E. coli	MPN/100 mL	0 (livestock in closely confined conditions with no water treatment)					

As with data from previous years, there are data for chloride that were higher than the most stringent guideline. Chloride concentrations were generally slightly higher than 100 mg/L at all down-gradient wells in both the spring and the fall, with the concentration in MW-14 being just above 100 mg/L in the spring. The higher chloride concentrations at the down-gradient wells compared with MW-2 could be reflective of the influence from the effluent, given that the chloride concentration in the effluent ranged from 115 mg/L to 152 mg/L in 2024. However, it is reasonable to expect that significant dilution would be achieved by the time the effluent reaches MW-14, with the resulting chloride concentration at MW-14 being much reduced compared with the effluent. As this is not observed consistently with the chloride data, the potential influence from other anthropogenic sources of chloride (and possibly other parameters) on MW-14 should be considered.

There was one other parameter where the concentration was above the guideline. This was *E. coli* for MW-14, with the concentration in the fall being 2 MPN/100 mL. As the concentration was low and has not been observed in previous recent samples collected from MW-14, it is possible that the result was due to sample contamination and not necessarily representative of the monitoring well water. In addition, the guideline used for this determination is the most stringent and likely not representative of conditions which are relevant to this monitoring well.

3.2 Privately-owned wells

The District provided the original laboratory reports for review and interpretation. The concentration of organic nitrogen was calculated using the TKN and ammonia data, with half the detection limit being used where the data were reported to be below the analytical detection limit. The spring samples were taken on April 17th and the fall samples were taken on October 17th. The samples for H7 were taken by the homeowner, as there is no outside tap. There is no guarantee that the approach used for sampling H7 meets the standards that are used by trained District staff.

Tables 3.4 and 3.5 summarise the spring and fall data, respectively, and include the data from MW-2 as a potential indication of background water quality. To summarise:

- For both the spring and the fall data, focusing on the privately-owned wells only, the lowest concentration was most commonly observed to occur at H1. This was also observed for the data from 2021 through to 2023. However, the highest data for ammonia, pH and both phosphorus parameters were associated with H1 in both the spring and the fall. This is also consistent with data from previous years.
- For both the spring and the fall data, the concentrations at all other house wells were generally higher than MW-2. Focusing on key parameters which can be used to track the movement of the District's effluent, the concentration of nitrate was generally elevated above the background well in H2, H3, H5 and H7 in both the spring and the fall. Sodium, chloride and conductivity were the elevated in H2, H4, H5 and H7 in the spring and the fall. For these parameters, the highest concentrations were observed in H4 with the exception of conductivity in the spring, where the highest concentrations were associated with H5. H4 is the furthest well from the wastewater treatment plant, with H5 being one of the most closely located to the wastewater treatment plant.
- There were no occasions when *E. coli* was found to be present in any of the samples, regardless of location of distance from the wastewater treatment plant.

Table 3.4: Summary of Spring Data

Parameter	Units	Location						
		MW-2	H1	H2	H3	H4	H5	H7
Total Nitrogen	mg/L	1.08	0.404	3.64	4.38	1.79	3.76	4.26
TKN	mg/L	< 0.050	0.404	0.131	0.241	0.231	0.181	0.185
Organic Nitrogen	mg/L	< 0.050	0.098	0.106	0.216	0.206	0.156	0.160
Ammonia	mg/L	< 0.050	0.306	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Nitrate	mg/L	1.08	< 0.01	3.51	4.14	1.55	3.58	4.07
Nitrite	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Phosphorus	mg/L	0.0071	0.246	0.0096	0.0083	<0.0050	0.0092	0.0120

Table 3.4: Summary of Spring Data (continued)

Parameter	Units	Location						
		MW-2	H1	H2	H3	H4	H5	H7
Orthophosphorus	mg/L	< 0.0050	0.206	0.0090	0.0080	<0.0050	0.0080	0.0110
Sodium	mg/L	17.1	7.96	56.5	20.2	71.8	71.0	54.4
Chloride	mg/L	8.57	0.71	75.2	41.1	97.5	94.9	70.4
Conductivity	µS/cm	450	270	751	433	841	844	746
pH	pH units	7.79	8.16	7.07	7.36	7.73	7.57	7.50
E. coli	MPN/100 mL	< 1	< 1	< 1	< 1	< 1	< 1	< 1

Table 3.5: Summary of Fall Data

Parameter	Units	Location						
		MW-2	H1	H2	H3	H4	H5	H7
Total Nitrogen	mg/L	1.15	0.318	4.38	4.15	1.40	3.67	4.87
TKN	mg/L	< 0.050	0.291	0.104	0.257	0.127	0.202	0.227
Organic Nitrogen	mg/L	< 0.050	0.076	0.079	0.232	0.102	0.177	0.202
Ammonia	mg/L	< 0.050	0.215	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Nitrate	mg/L	1.15	0.027	4.27	3.90	1.27	3.47	4.65
Nitrite	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Phosphorus	mg/L	0.0121	0.228	0.0160	0.0138	0.0068	0.0143	0.0154
Orthophosphorus	mg/L	< 0.0050	0.227	0.0100	0.0080	< 0.0050	0.0080	0.0100
Sodium	mg/L	16.3	8.16	58.2	19.9	77.2	71.2	54.6
Chloride	mg/L	9.33	0.47	80.4	38.1	110	105	85.7
Conductivity	µS/cm	462	288	783	414	898	892	783
pH	pH units	8.01	7.97	7.69	7.59	7.96	7.81	7.86
E. coli	MPN/100 mL	< 1	< 1	< 1	< 1	< 1	< 1	< 1

The water quality was compared with the BC Water Quality Guidelines, focusing on groundwater uses for the most stringent of either potable or agricultural purposes, given the assumption that any water from these wells would be used to support potable and/or agricultural activities on the property. As in Section 3.1, the outcomes are summarised (Table 3.6), with green indicating concentrations below the guideline and red indicating that at least 1 data point was above the guideline. The guideline comparison is for the following parameters: nitrate, chloride, conductivity and pH, with the guideline for conductivity being based on a

moderately tolerant crop. Chloride was above the guideline at H4 and H5 but only for the fall monitoring event. Chloride concentrations above the guideline have been consistent for H4 since the beginning of the dataset in 2021. The chloride concentrations for H5 were observed to be above the guideline in 2022 and 2023 but not 2021. All other parameters were below the corresponding guidelines.

Table 3.6: Guideline Comparison

Parameter	Units	Guideline	Location					
			H1	H2	H3	H4	H5	H7
Nitrate	mg/L	≤ 10 (drinking water)						
Chloride	mg/L	100 (irrigation)						
Conductivity	µS/cm	2,200 (irrigation)						
pH	pH units	5.0 to 9.5 (irrigation)						
E. coli	MPN/100 mL	0 (livestock in closely confined conditions with no water treatment)						

With respect to the potential for impacts as a result of the release, it is reasonable to assume that the well most likely to be impacted would be H5, as this is the closest well to the disposal area. However, the highest concentrations were typically associated with wells located further away. Given the limited information on well depth, construction, maintenance and other activities in the near vicinity (such as septic fields, livestock raising, fertilizer addition, manure stockpiles, etc.) it will continue to be challenging to clearly define if any water quality characteristics are directly related to the release from the District's wastewater treatment plant.

4. Conclusions and recommendations

From the information which was reviewed and evaluated, the following conclusions are drawn:

- All data points indicated that the distance to the groundwater level was over 0.5 m from the ground surface. This depth is not a requirement of the operational certificate but is taken from the Municipal Wastewater Regulation for a minimum unsaturated soil depth for a Class A or B effluent.
- For the District-owned monitoring wells, the highest concentrations tended to be associated with the three wells located within or close to the wastewater plant boundary. Focusing on nitrate as the best tracer for the District's effluent, the classic trend of the higher concentrations being closer to the point of discharge was observed in both the spring and the fall. With respect to BC Water Quality Guidelines for either potable or agricultural uses, chloride was above the most stringent guideline on at least 1 occasion for each of the down-gradient wells. It is not known whether the increase above the guideline was related to the effluent release or other factors, given that the proximity to roads and agricultural areas and the lack of decrease in concentration at MW-14. *E. coli* was above the most stringent

guideline at MW-14 in the fall. This is considered to be an anomaly, given the lack of presence of *E. coli* with previous data and the very low concentration recorded.

- For the privately-owned monitoring wells, there was no clear relationship between concentration and distance from the wastewater treatment plant. With respect to BC Water Quality Guidelines for either potable or agricultural uses, chloride concentrations at H4 and H5 continue to be above the guideline. Given the limited information on well depth, construction, maintenance and other activities in the near vicinity (such as septic field, livestock raising, fertilizer addition, manure stockpiles, etc.) it will continue to be challenging to clearly define if any water quality characteristics are directly related to the release from the District's wastewater treatment plant.
- Generally, there is consistency between the outcomes of the 2024 data and the data from 2021 through to 2023.

The following recommendations are made:

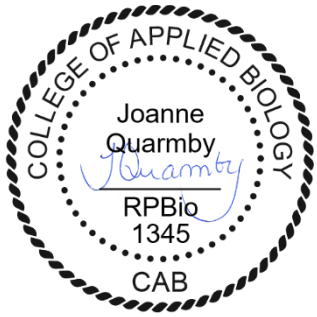
- Water quality samples from all locations should be taken on the same date, or within a day or two of each other, where possible.

5. Closure

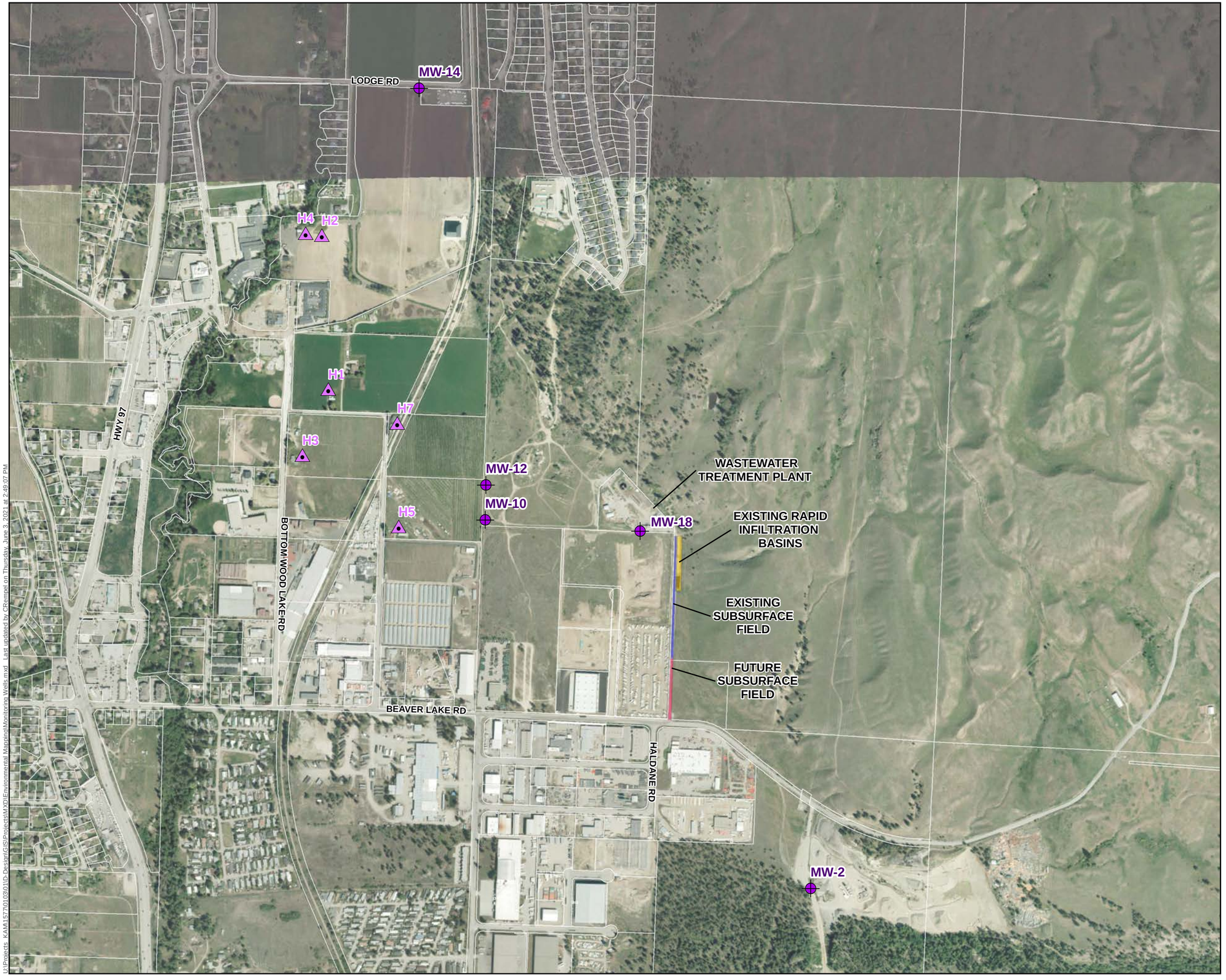
Groundwater monitoring is required as part of the operational certificate and the data are to be reported annually with interpretation, as indicated in Section 4.4 of the operational certificate. The information presented in this technical memorandum aims to fulfil the requirement of Section 4.4(b) of the operational certificate.

Please do not hesitate to contact us if there are any questions or if clarification is required.

Sincerely,
QUARMBY ENVIRONMENTAL LTD.



Dr. Joanne Quarmby, R.P.Bio.
Water and Wastewater Specialist



LAKE COUNTRY
Life. The Okanagan Way.

District of Lake Country
OC Amendment

Monitoring Wells

House Well

Monitoring Well

The accuracy & completeness of information shown on this drawing is not guaranteed. It will be the responsibility of the user of the information shown on this drawing to locate & establish the precise location of all existing information whether shown or not.

0 50 100 200 300
Meters

N

Coordinate System:
NAD 1983 UTM Zone 11N

Scale:
1:9,500

Data Sources:

- Imagery provided by ESRI.
- Parcels provided by DataBC.

Project #:	1577.0103.01
Author:	CR
Checked:	
Status:	
Revision:	A
Date:	2021 / 6 / 3

URBAN systems

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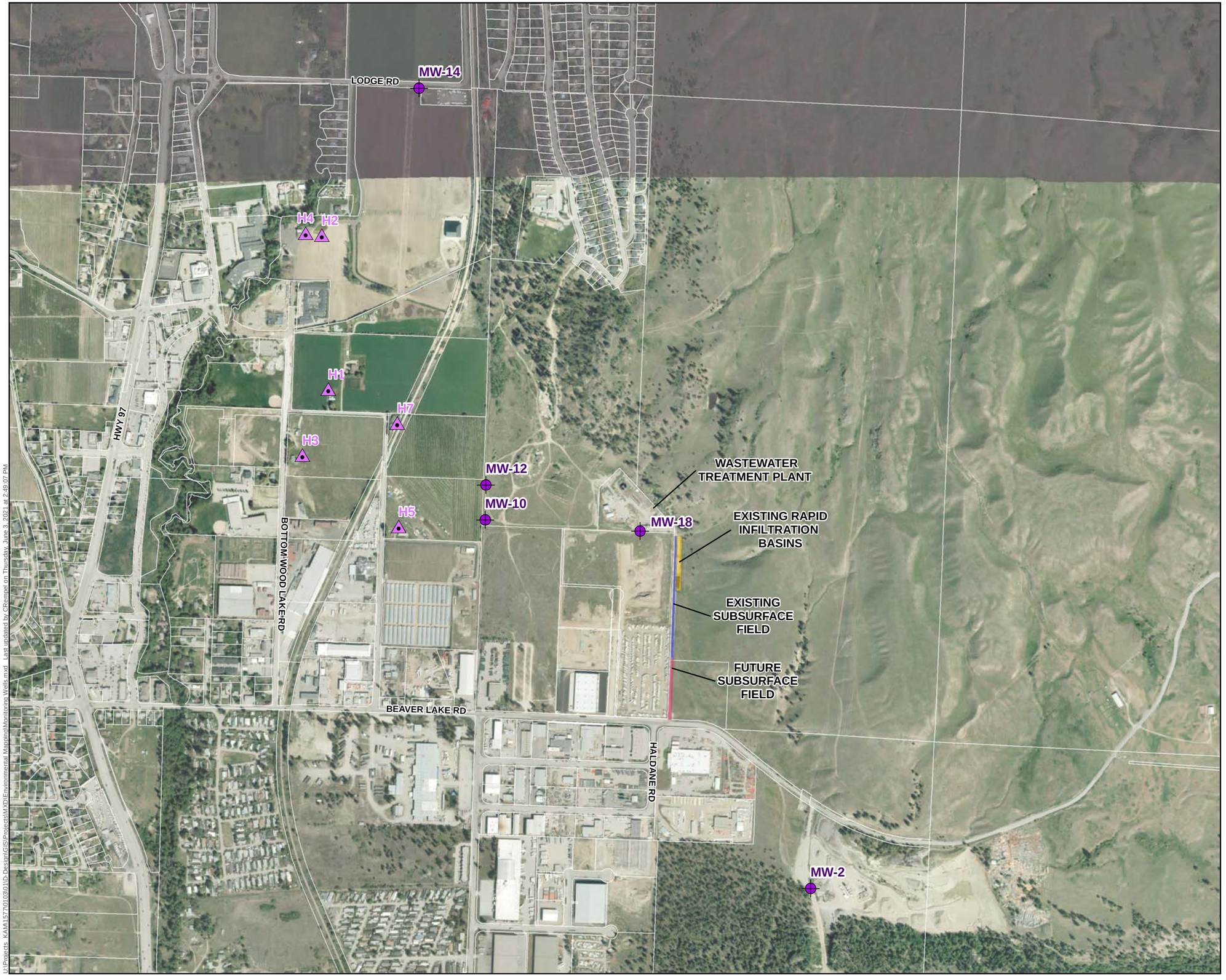
Appendix E – Monitoring Wells Locations



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Monitoring Wells

House Well

Monitoring Well

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Status:	
Revision:	A
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URBAN systems

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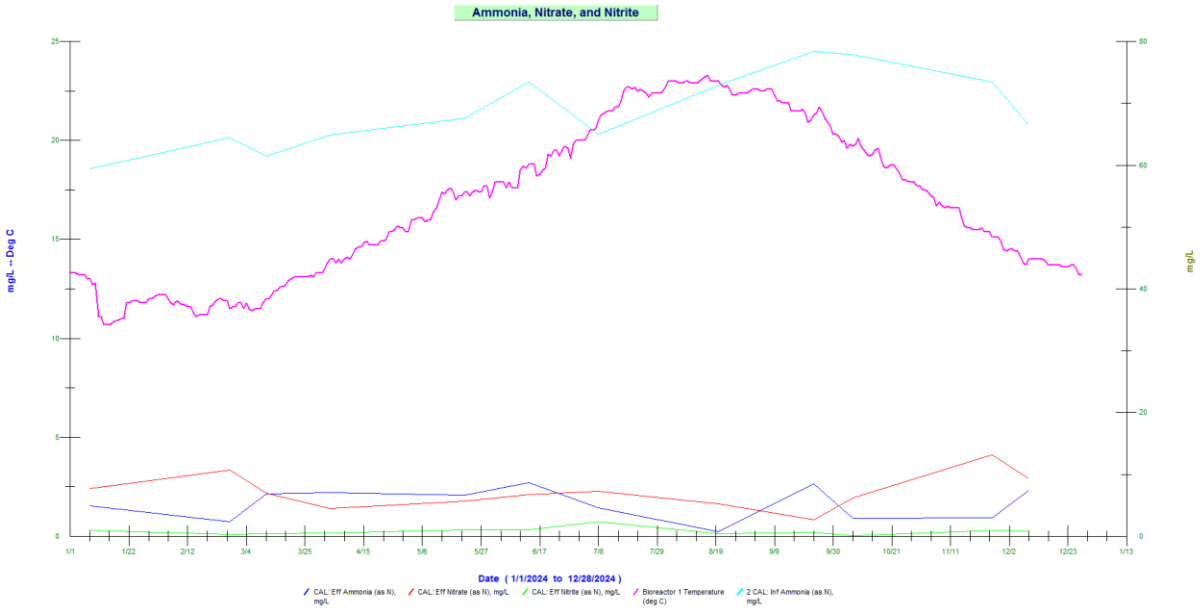
Appendix F – Plant Performance Trends

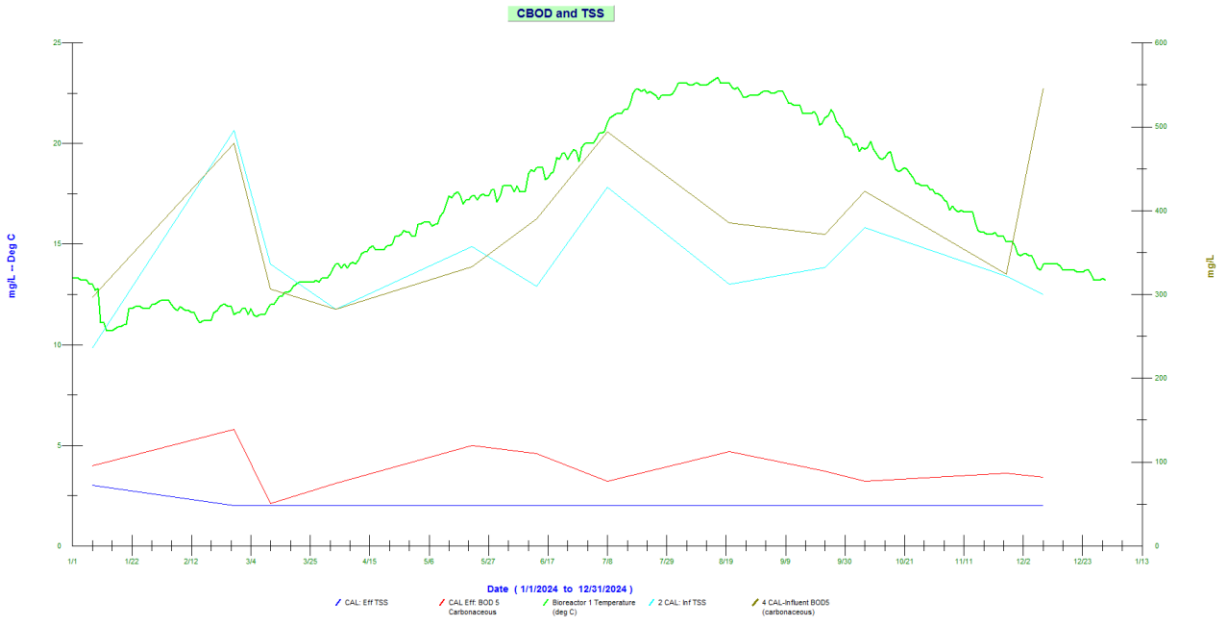
Plant Performance Trends

1.1 Ammonia, Nitrate, and Nitrite



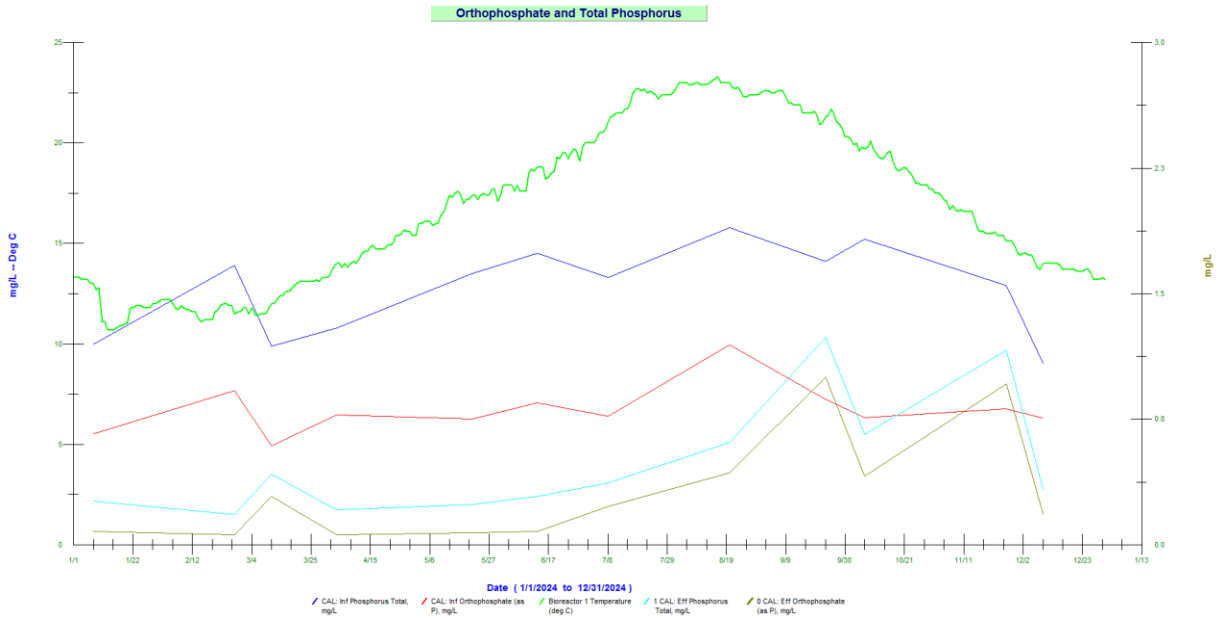
Influent ammonia levels remain relatively consistent throughout the year, peaking during the summer months. Effluent concentrations of ammonia, nitrate, and nitrite show stability throughout the year, with a slight increase in nitrate levels observed towards the end of the year. Notably, despite this slight increase, the total nitrogen concentration remains below the permitted level, indicating effective regulatory compliance.

1.2 CBOD and TSS



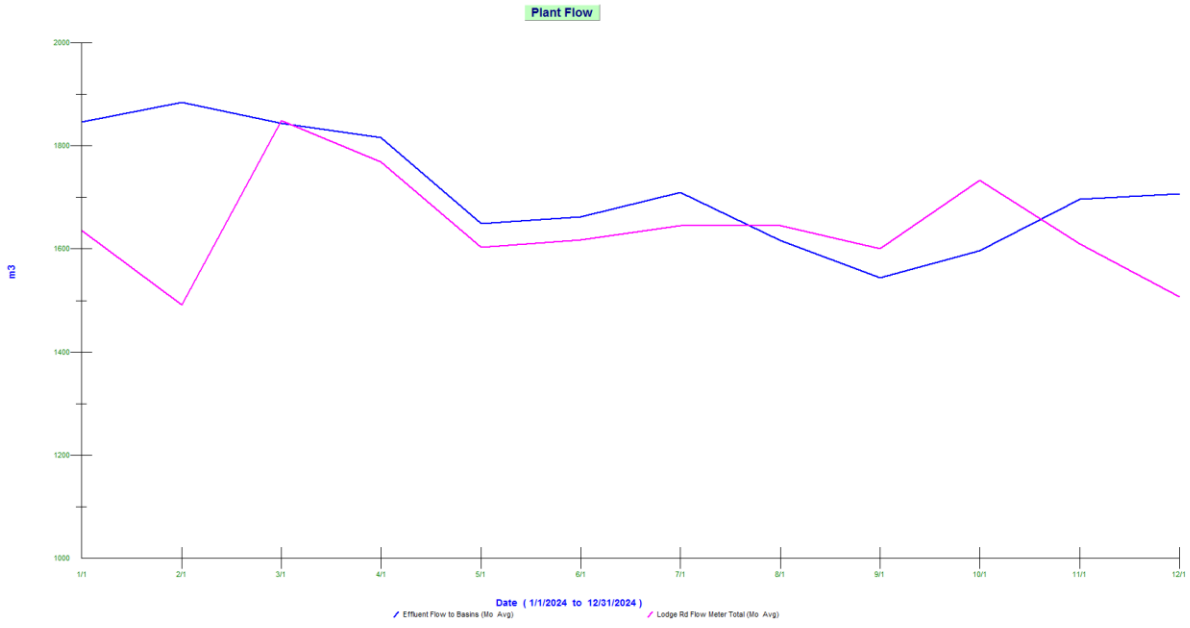
Both CBOD and TSS influent and effluent concentrations remained consistent throughout the year. The low influent TSS and CBOD can be partially attributed to the new disc filters installed in 2023, among other factors.

1.3 Orthophosphate and Total Phosphorus



Effluent orthophosphate and total phosphorus increased in the latter part of the year, which may be attributed to higher septage loads during the summer months. This is suspected to be a significant contributor to nutrient loading at the plant, as mentioned in the main report.

1.4 Plant Flow



Plant flow remains relatively consistent throughout the year.