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April 27th, 2023
File No. W2020-019.2022

FERNIE ALPINE RESORT UTILITIES CORPORATION
1505 17th Avenue SW
Calgary, Alberta
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Attention: Mr. Patrick Majer

Dear Mr. Majer:

**Re: FERNIE ALPINE RESORT
WASTEWATER TREATMENT PLANT
2021 ANNUAL REPORT**

Forwarded is a pdf copy of the 2022 Annual Wastewater Report for the above property.

Should you have any questions, please call us at 403-238-9510 or email to jana@iqwater.ca.

Sincerely,

IQWATER INC.

A handwritten signature in blue ink, appearing to read "Jana Zverina", is written over a faint, larger version of the signature.

Jana Zverina, M.Sc., P.Eng.

IQWater Inc.



**2022 WASTEWATER TREATMENT PLANT
ANNUAL REPORT**

**FERNIE ALPINE RESORT
FERNIE, B.C.**

Prepared for:

**FERNIE ALPINE RESORT
UTILITIES CORPORATION**
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Calgary, Alberta
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April 27th, 2023
Report # W2020-019.2022

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1.0 INTRODUCTION

1.1 BACKGROUND

The following annual report for the Wastewater Treatment Plant at Fernie Alpine Resort (FAR) operated by Fernie Alpine Resort Utilities Corporation (FARUC) is compiled in accordance with the requirements of the Municipal Sewage Regulation (MSR). This report covers the 2022 calendar year.

Due to the nature of the resort the plant is subjected to a large seasonal swing in utilization with the winter ski period imposing the highest demands. The critical time for sewage flows at the resort is from mid-December to the end of March during the peak ski season. Summer utilization of the treatment work is generally low.

FARUC treats its wastewater at a tertiary treatment plant designed to remove BOD₅, suspended solids, ammonia, and phosphorous. Wastewater is disinfected with ultraviolet (UV) lamps prior to discharge into the Elk River.

Plant effluent quality has been high during the year. There has been a clearly decreasing trend in ortho-phosphorus and total phosphorus levels since 2007 and notably between 2016 and 2022. All the results for ortho-phosphorus and total phosphorus were below the MSR discharge limits with the exception of one ortho-phosphorus result. FARUC began a monitoring and Clearpac dosing investigation in the winter of 2007 to reduce effluent phosphorous concentrations. The reduction program has shown significant improvement of phosphorus levels in plant effluent. This work will continue to maintain all the ortho and total phosphorus concentrations below the discharge limits.

2.0 REGISTRATION REQUIREMENTS

This section describes operating requirements as specified in the Resorts of the Canadian Rockies Inc.'s (RCRI) Registration Letter RE 17139 issued on September 30th, 2002. The registration describes parameters that must be tested for operating conditions, sampling frequency, and sampling locations.

2.1 PARAMETERS

The following parameters are to be monitored:

pH	Field Sample
Temperature	Field Sample, measured in Celsius
Flow	Field Samples, measured as m ³ /d
BOD ₅	Five day biochemical oxygen demand, measured in mg/l
TSS	Total suspended solids or non-filterable residue, measured in mg/l
NH ₃	Ammonia concentration, expressed as nitrogen in mg/l
NO ₃	Nitrate concentration, expressed as nitrogen in mg/l
NO ₂	Nitrite concentration, expressed as nitrogen in mg/l
Total-P	Total phosphorous concentration, measured in mg/l
Ortho-P	Orthophosphate concentration, measured in mg/l
Fecal coliform	Bacterial concentration, measured as colony forming units per 100ml
Toxicity Bioassay	96 hour toxicity test, recorded as pass or fail

2.2 REGISTRATION LETTER OPERATING CONDITIONS

The treatment plant is required to meet the effluent discharge conditions outlined in Table 1.

Table 1
Effluent Limits

Parameter	Limit	Unit
Flow	1280	m ³ /d
BOD ₅	45	mg/l
TSS	45	mg/l
Total-P	1.0	mg/l
Ortho-P	0.5	mg/l
Coliforms*	200	CFU/100ml
Toxicity Bioassay	pass	n/a

*Limit for recreational waters only, not included in RCRI registration letter

Primary screenings and dewatered sludge are to be disposed of at the Crowsnest Pass/Pincher Creek Landfill. Disposal at other sites requires authorization under the Waste Management Act.

Operators at the plant are required to be certified in accordance with Section 22 of the MSR.

2.3 REPORTING REQUIREMENTS

An annual report demonstrating the performance of the facility is to be publicly posted on the Internet within 120 days of the end of the calendar year. The report must include tabulated standards and results for all test samples, interpretation of the results, an indication of the state of compliance of the facility, and the total wastewater flow for the reported period.

In addition the report must also include the following:

- Notification of significant operating events including discharge variances outside given limits,
- Recommendations for operational or facility modifications,
- Notification of proposed or implemented plant modifications,
- Details of proposed or implemented water conservation measures,
- A plan indicating existing and proposed developments,
- A comparison of projected and actual wastewater flows,
- Projected wastewater flows resulting from proposed development compared to the remaining waste water treatment plant (WWTP) capacity, and
- A comparison of water supply and wastewater flows.

As with the previous Annual Reports, this report includes additional information on wasted sludge volumes.

2.4 SAMPLING FREQUENCY

The MSR Registration requires RCR and, as such, the contract operator FARUC, to undertake the environmental testing program outlined in Table 2 below.

Elk River testing requires that a minimum of 18 samples annually are taken from each of the upstream, initial dilution zone (IDZ) and downstream river locations, relative to the outfall diffuser. The sampling locations were identified in the April 2001 Environmental Impact Study.

A minimum of 12 influent samples are required for BOD₅ and TSS. Flow data is to be collected continuously.

The intent of the environmental testing procedure outlined in Table 2 is to collect influent and effluent samples during peak demand periods as indicated by resort bookings. To correspond with peak plant loading, river samples are to be collected on the same day as effluent samples.

In addition to the program and tests listed above, other in-plant testing is needed to permit operational control of the process as shown in Table 2 below.

Table 2

Sampling Location/Frequency/Type

Parameter	Location					
	Elk River	QTY	Influent	QTY	Effluent	QTY
pH	WS/G	18	/	/	M/G, WS/G	25
Temp	WS/G	18	/	/	/	/
Flow	/	/	D/C	n/a	D/C	n/a
BOD ₅	/	/	M/G	12	M/G, WS/G	25
TSS	WS/G	18	M/G	12	M/G, WS/G, D/C	25
NH ₃ -N	WS/G	18	/	/	M/G, WS/G	25
NO ₃ -N	WS/G	18	/	/	M/G, WS/G	25
NO ₂ -N	WS/G	18	/	/	M/G, WS/G	25
Total-P	WS/G	18	/	/	M/G, WS/G	25
Ortho-P	WS/G	18	/	/	M/G, WS/G	25
Fecal Coliform	WS/G	18	/	/	M/G, WS/G	25
Toxicity Bioassay	/	/	/	/	3 Y/G	3

Where:

- WS/G Weekly seasonal grab sampling, required for three six-week periods during the winter peak, the spring after ice-out, and in the fall when river turbidity and flows are low.
- D/C Daily continuous sampling using an on-line instrument and data logger.
- M/G Monthly grab sample (not required when weekly seasonal testing is taking place).
- 3Y/G Three samples per year to correspond with WS/G sampling periods.

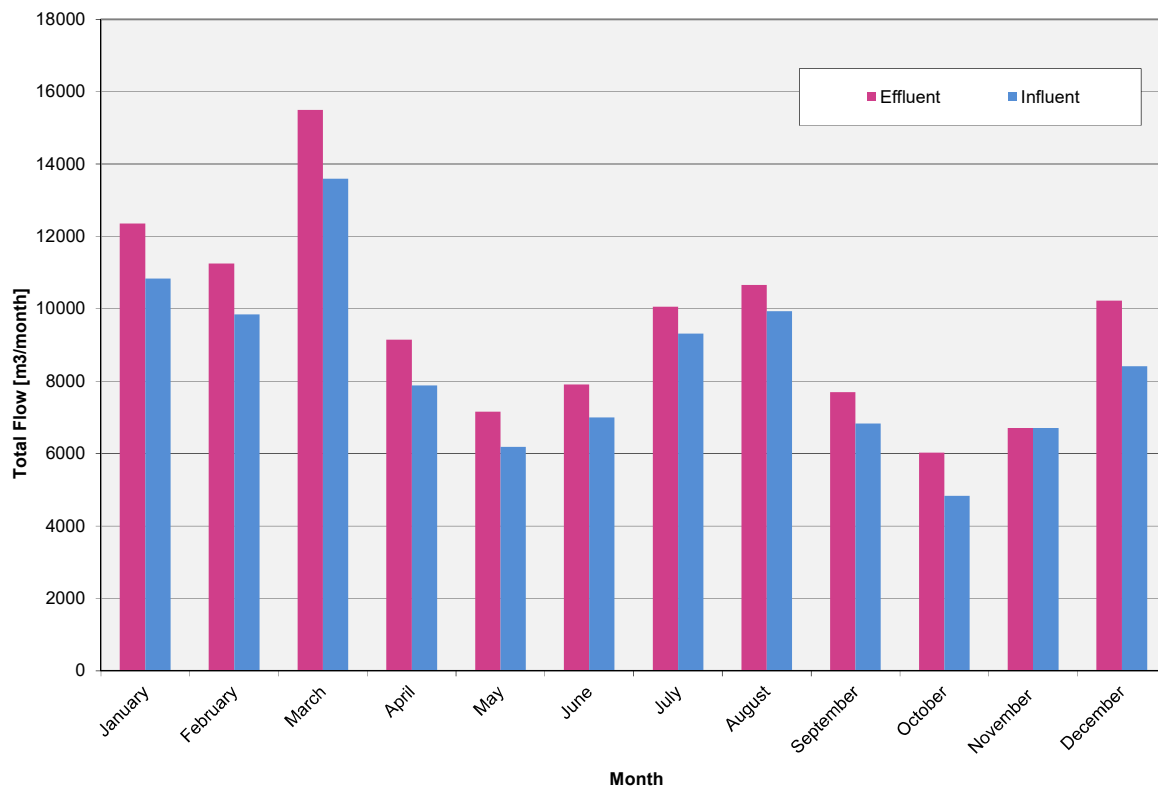
3.0 SEWAGE FLOW RECORDS

This section provides data and analysis regarding the plant influent and effluent flows, and compares 2022 data to previous years.

Total effluent flow from the WWTP for all of 2022 was recorded from the effluent weir type flow meter as 114,701 m³ and the average was 311 m³ per day. The graph below shows the 2022 total effluent flow per month vs total influent for the plant. The effluent flow follows very closely the influent.

Available monthly total effluent flow meter records for 2022 are provided in Figure 1a.

Figure 1a
 Effluent and Influent Flow Meter Monthly Flow Totals

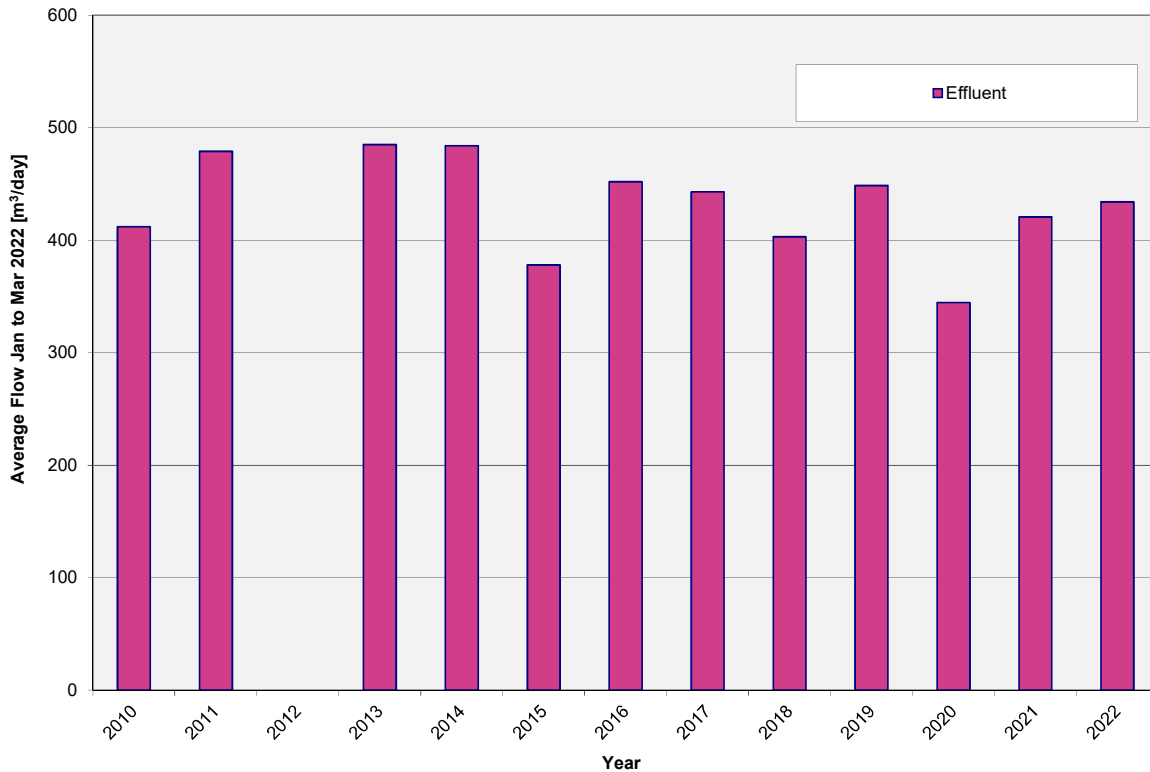


The ski resort operates with higher winter and late spring sewage flows (January to March) than during any other period. The average daily plant flow through January, February and March of 2022 was slightly higher at 434 m³/day compared to the previous year's (2021) January to March average flow at 421 m³/day and much higher compared to 2020 levels at 344.6 m³/day. It should be noted that the January to March 2020 flow was the lowest when compared to the previous years, likely due to a significant decrease in March due to Covid-19 restrictions. Both 2021 and 2022 flows were comparable to pre-Covid levels.

Also, as shown on the 2022 graph above, there is a noticeable increase in flow over the summer holiday months, July and August. This trend has been observed over the last several years.

The average daily plant flow through January, February and March of 2019 was 449 m³/day and 2018 was 403 m³/day. The average daily flow was 443 m³/day in 2017, 452 m³/day in 2016, 378 m³/day in 2015, 484 m³/day in 2014, 485 m³/day in 2013, the average daily flow could not be calculated in 2012 but it was 479 m³/day for the same time period in 2011, compared to 412 m³/day over the same period in 2010.

Figure 1b
 Average Daily Flow during Jan – Mar Period



Peak flow for the year reached 792 m³/day on March 16th, which was 38 % below the allowable daily limit of 1,280 m³/day.

Historical peak flows are as follows: 2021 (819 m³/day), 2020 (925 m³/day), 2019 (1043 m³/day), 2018 (687 m³/day), 2017 (1,095 m³/day), 2016 (844 m³/day), 2015 (1,058 m³/day), 2014 (1,036 m³/day), 2013 (1,181 m³/day), 2012 (811 m³/day), 2011 (989 m³/day) and 2010 (823 m³/day) and 2009 (1,178 m³/day). Usually, the peak flow day occurred during the heavy ski season, which was to be expected. In 2021, the peak flow day occurred in November which likely corresponds with the beginning of the season after the Covid-19 slow down. In 2022 the peak flow was measured in March.

A summary of sewage flow for years 2003 through 2023 is provided in Table 3 and Figures 2 and 3:

Table 3
2003 – 2021 Flow Comparisons

Year	Sewage Flow (m ³ /day)			Days Over Limit
	Total	Average	Peak	
2003	137,035	375	1,244	0
2004	151,815	414	1,307	1
2005	125,699	344	1,293	1
2006	127,202	348	1,058	0
2007	144,480	396	1,177	0
2008	135,767	372	873	0
2009	113,336	311	1,178	0
2010	104,815	287	823	0
2011	90,213* (122,275) ¹	335	989 ²	0
2012	62,509** (122,610) ¹	335	811 ²	0
2013	121,982	335	1,181	0
2014	125,437	344	1,036	0
2015	90,931	250	1,058	0
2016	108,326	296	844	0
2017	108,695	296	1,095	0
2018	105,073	288	687	0
2019	105,748	290	1043	0
2020	101,640	274	925	0
2021	130,032	352	810	0
2022	114,701	311	792	0

* not including part of Sept and all of Oct, Nov, and Dec 2011

** not including all of Jan, Feb, part of Aug, and all of Sept, Oct, and Nov 2012

¹ (data) in brackets – estimate based on daily average

² the number does not reflect a true peak as all the data was not available during high flow months

2004 to 2012

Higher flows in 2004 were caused by severe infiltration through the collection system.

Lower flows in 2005 and 2006 can also be attributed to the fact that a lot of sludge together with water was trucked away from the WWTP itself due to the volumes of sewage the existing plant would not handle without an equalization tank.

Through 2008 total and average flow decreased somewhat from 2007, there were no instances where flow exceeded the 1,280 m³/day registration limit, compared to one day in each of 2004 and 2005. Peak flow dropped due to full operation of the equalizing tank and collection system improvements to eliminate storm water infiltration.

The average flow for 2009 further decreased from 2008 (372 m³/day down to 311 m³/day) and there were no instances where the flow exceeded the 1,280 m³/day. The peak flow increased from 2008 but is comparable to the other years.

The average flow for 2010 further decreased from 2009 (311 m³/day down to 287 m³/day) and there were no instances where the flow exceeded the 1,280 m³/day. The peak flow decreased from 2009 and is comparable to 2008.

The average flow for 2011 had increased slightly from 2010 (287 m³/day) and 2009 (311 m³/day) and there were no instances where the flow exceeded the 1,280 m³/day limit. The peak flow had increased slightly from 2010; however it was still lower than 2008 and prior. Please note, the average flow was calculated for the data available and may not have been representative of the whole year as October, November and December were usually lower flow months.

Note that historically from 2004 to 2010 the peak flow occurred systematically in January, February, March and December, which was consistent with the facility operations. Although some data was missing, the values for 2011 were considered "as is". However, there was more data missing in 2012. In addition, the missing data was among others in January and February, which were historically two out of four highest flows in a year. January was on average the highest month.

The average flow for 2012 was the same as observed in 2011 (335 m³/day) which had increased slightly from 2010 (287 m³/day) and 2009 (311 m³/day). There were no instances where the flow exceeded the registration limit of 1,280 m³/day; however, there was no data for January and February (two out of four peak months in a year). The peak flow of 811 m³/day was recorded in December, which was one of the four peak flow months, and therefore it was reasonable to assume that it would be close to or somewhat above the same number in January or February. Based on the remaining measurements it was unlikely that the peak in January or February would exceed the registration limit.

Please note, the average flow was calculated for the data available and may not have been representative of the whole year as January, February, part of August and all of September, October, and November information was not available. This average flow was used to estimate the total yearly effluent flow, which likely represented a reasonable estimate.

The records for 2011 and 2012 were incomplete due to the effluent flow meter failure from a lightning strike. The meter was repaired and fully functional for 2013.

2013 to 2022

In 2022 the average flow was 311 m³/day, which is more than during previous several years but less than 2013, 2014 and 2021. While the peak month is usually December (in 2021 the peak was in November) the peak flow was recorded in March 2022, followed by December and June. There are no instances where the flow exceeded the plant maximum allowable flow and daily discharge of 1,280 m³/day.

The average flow for 2020 was low and well below previous several years, which can likely be attributed to the Covid-19 restrictions implemented in March 2020. There were no instances where the flow exceeded the plant maximum allowable flow and daily discharge of 1,280 m³/day. The peak flow was higher than that of 2018 but very similar to 2013 to 2015 and 2017. Contrary to the previous years, when the highest peak was in December, in 2020 the highest peak was recorded in February.

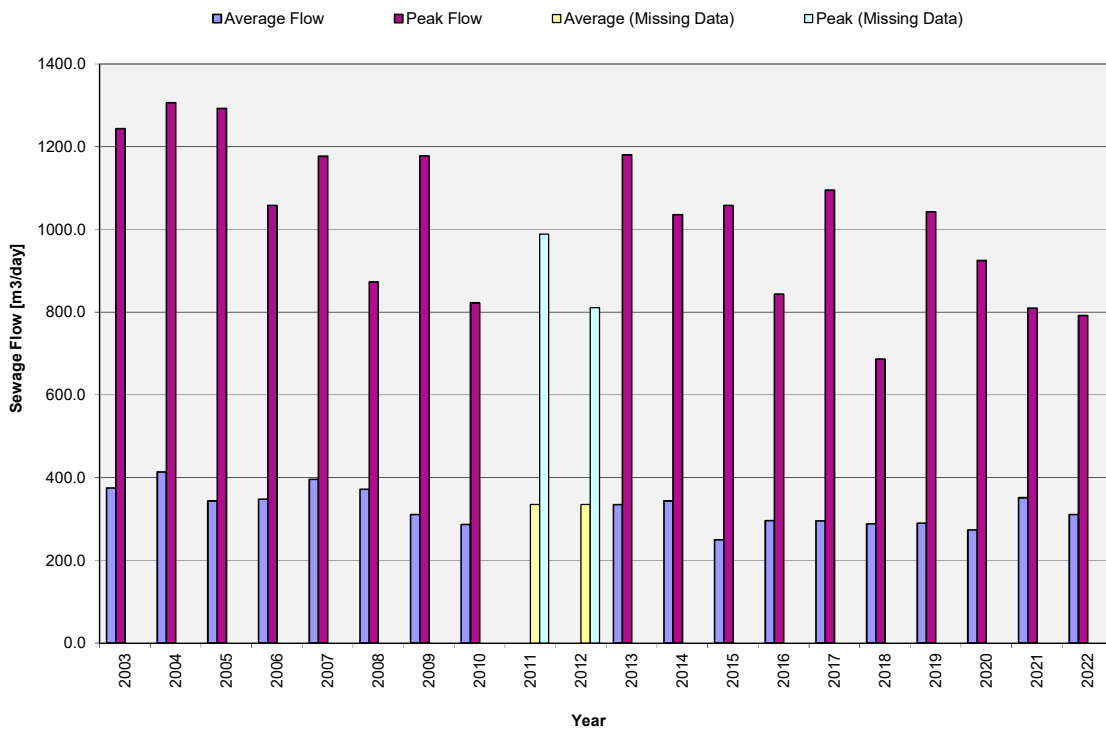
The highest month in 2019 for average flows was in February followed by January and December.

Between 2013 and 2022 the average sewage flow showed a steady to decreasing trend with slightly higher value in 2021 and again lower value in 2022. A decreasing trend in peak values between 2013 and 2022 is shown on graphs below.

Daily wastewater flows are strongly correlated to weather and the number of day-users at the resort with the peak ski season having the highest flows. Summer flow results from non-skiing related recreational activities, generally hiking or mountain biking events. The lowest plant flow is experienced in the shoulder season periods (April to June and September to November). The lowest average as well as peak flows in 2022 were recorded in October at 194 and 273 m³/day, respectively.

The approximately 85 permanent residents in addition to several year-round restaurants providing services to casual visitors ensure that the sewage flows never drop to zero. Figure 2 provides monthly average and peak day sewage flows since 2003.

Figure 2
 Average and Peak Sewage Flow Comparison Graph



* Note that the values for 2011 and 2012 may not be representative as some of the effluent flow data for these years are missing

Figure 3
 Total Sewage Flow Graph

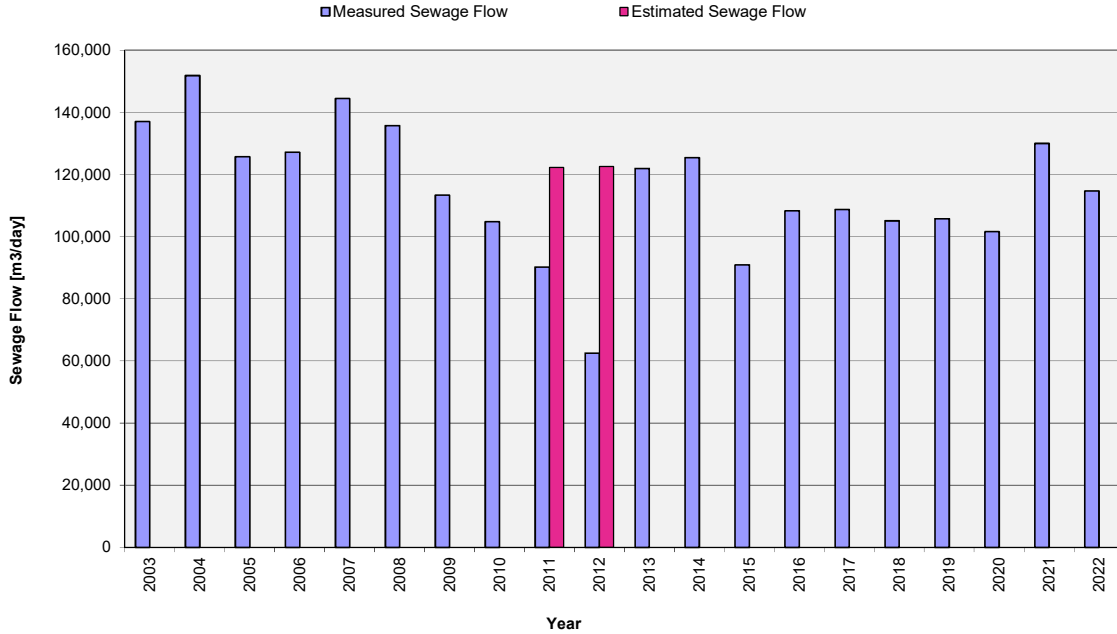
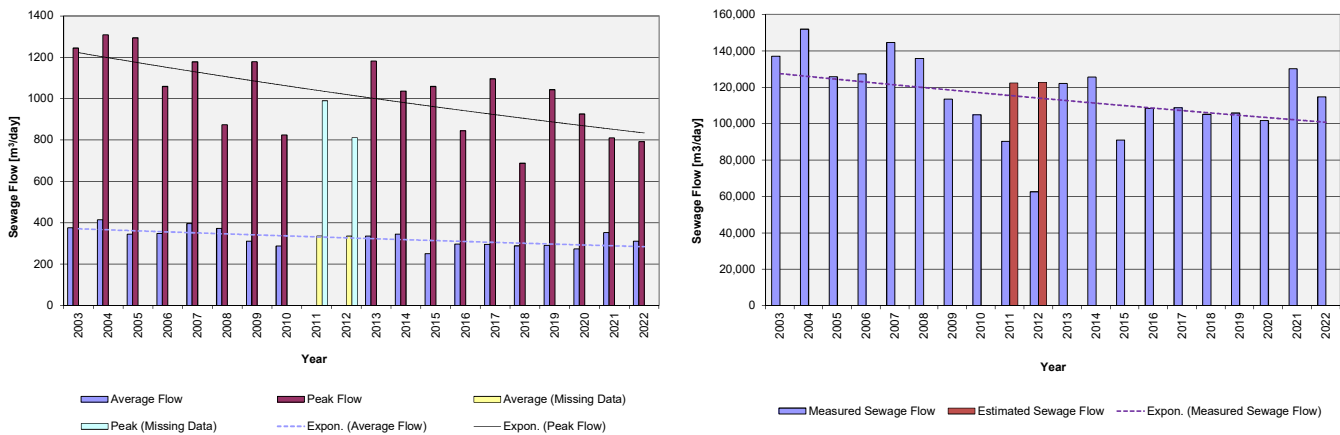
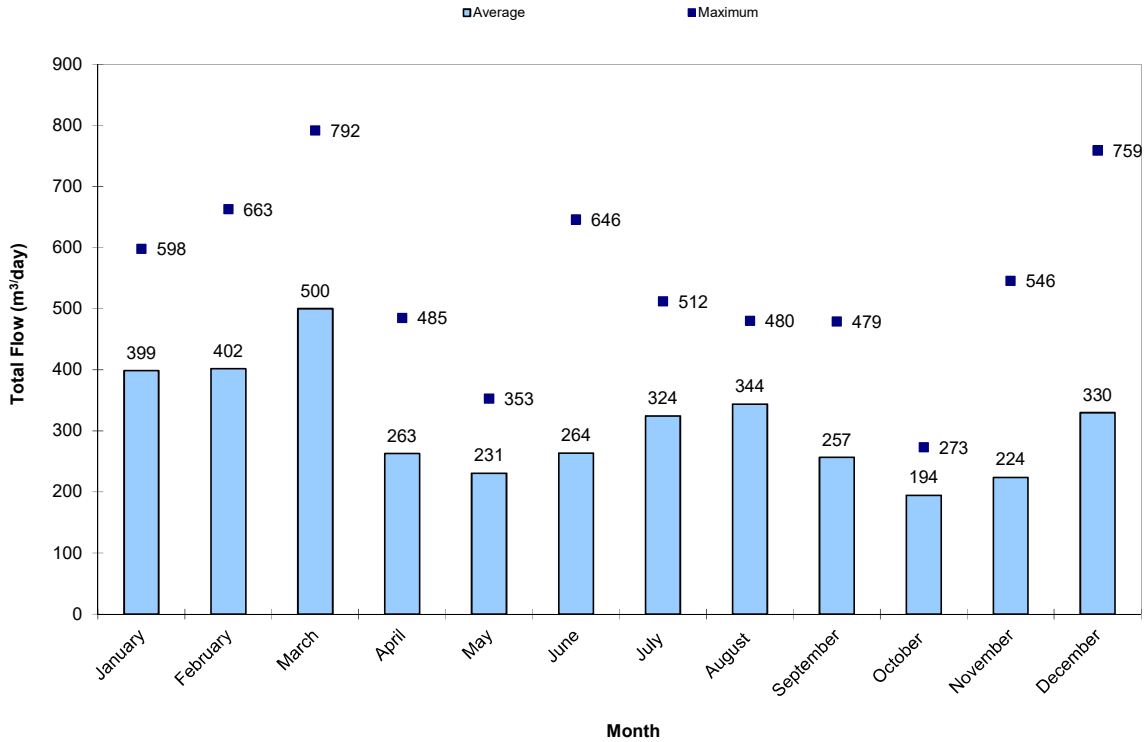


Figure 3a and Figure 3b
 Trendlines for Average, Peak, and Total Sewage Flow Graphs



Sewage flow trend is shown on Fig 3a and 3b above, note that total sewage production has in general a declining trend with relatively stable flow numbers over the last five years.

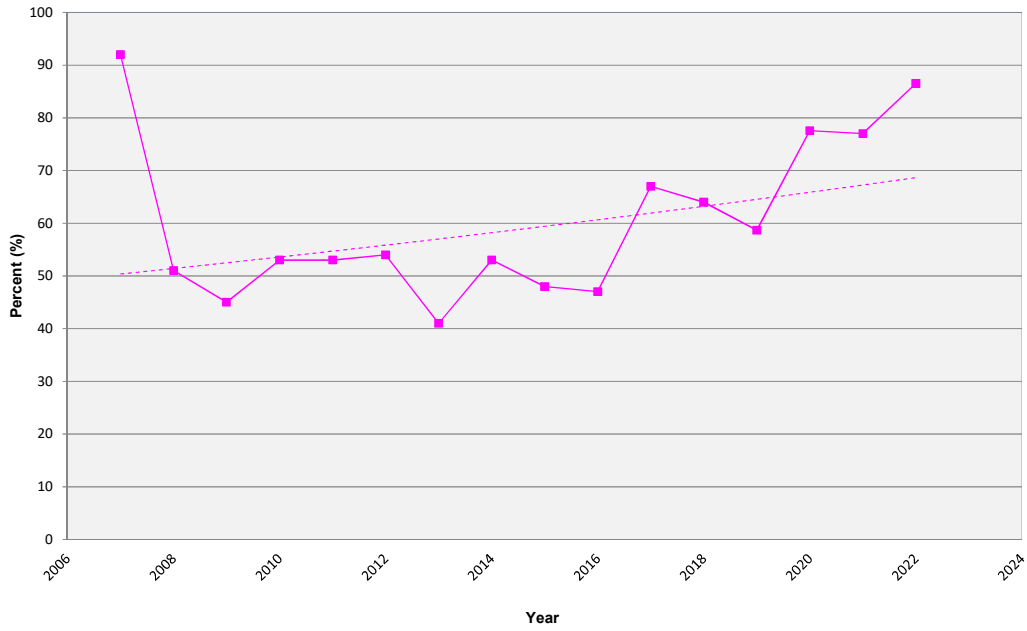
Figure 4
 2022 Sewage Effluent Average and Peak Flows by Month



The Resort's ongoing program to reduce sewer infiltration is demonstrated by the reduction in return flow to the plant vs. total water usage. In 2007 the total sewage flow was equal to 92% of the total water production; however, this number may not be representative as the total water production values were incomplete. In 2008 this figure decreased to 51%, which is considered to be a more representative. In 2009, this figure decreased even further to 45%. In 2012, the total sewage flow was equal to 54% of the total water production, and was consistent with 2010 and 2011. This again is slightly higher than in 2009 but similar to 2008. In 2013, the total sewage flow was 41% of the total water production, which was the lowest observed to date. In 2014, the total sewage flow was 53% of the total water production which was a slight increase from 2013 but comparable to that of 2008, 2010, 2011 and 2012. There was a slight decrease in 2015. The total sewage flow was 48% of the total water production which is comparable to 2013. The total sewage flow for 2016 was 47% which was very similar to that found in 2015. The total sewage flow for 2017, 2018, 2019 and 2020 was 67%, 64%, 59% and 77%. The total sewage flow for 2021 was 77% which is the same as found in 2020. In 2022 the total sewage flow was 86.5%.

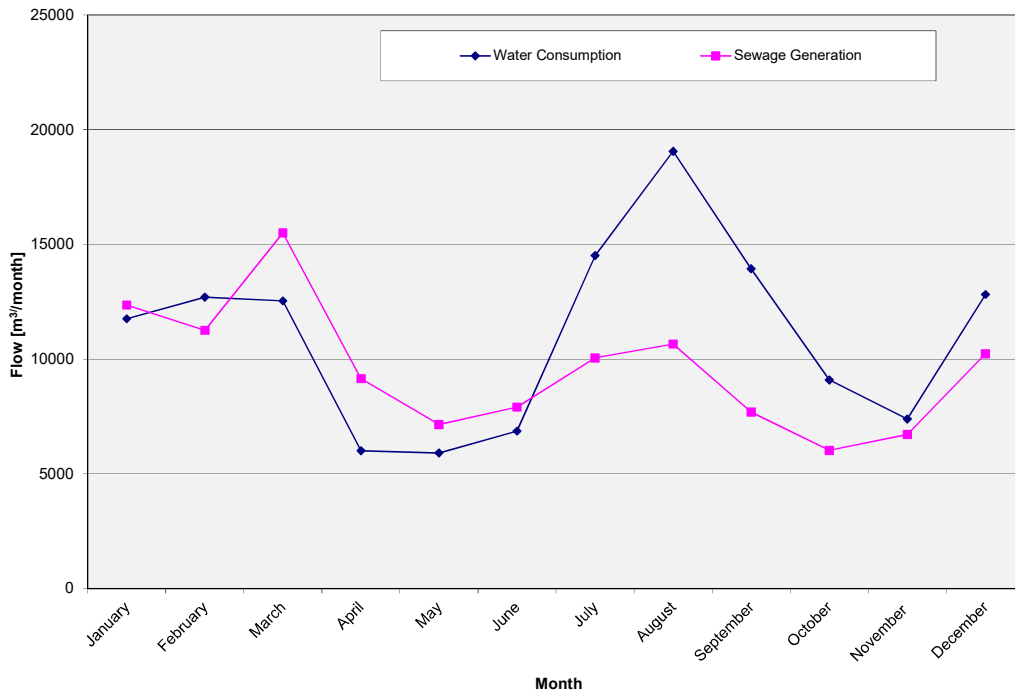
Note that in general, with the exception of 2007, there was relatively steady trend in % of return flow vs total water usage until 2017 and an increasing trend recorded between 2017 and 2022. The percent sewage flow vs the water production for each year since 2007 has been plotted in Figure 5 below.

Figure 5
 Percent Sewage Flow vs Water Production



Water use at the hill is compared to the amount of sewage received at the WWTP in Figure 6 for 2022.

Figure 6
 Water Consumption and Sewage Generation 2022



The impact of rainfall and snowmelt on sewage flow has decreased each year since 2007 and 2017 as a result of system improvements, the use of water restrictive fixtures and the infiltration reduction program. There is an increasing trend shown between 2017 and 2022.

4.0 SEWAGE FLOW PROJECTION

This section shows projected wastewater flow for 2007 through 2022 based on current development plans and provides an estimate of remaining plant capacity.

Based on unit generation rates provided in the BC Health Act for various lodging types, the estimated highest day wastewater generation for 2011 would have been 1302.3 m³/day. Using the actual peak flow of 811 m³/day, a correction factor of 0.62 was calculated. Averaged correction factor for 2007, 2008, 2009, 2010, 2011, 2012, 2013 and 2014 was calculated and multiplied by the future estimated flows to more accurately reflect potential resort sewage generation rates.

In 2007, 2008, 2009, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020 and 2021, respectively, the correction factors were 1.20, 0.89, 1.14, 0.65, 0.76, 0.62, 0.91, 0.80, 0.81, 0.65, 0.84, 0.51, 0.78, 0.80 and 0.79, which showed that the resort had reduced the impact of both storm water infiltration and reduced peak flows.

Projected daily peak wastewater flows until 2010 by year were provided in Table 4 for the Resort's planned expansions. The highest water generation for 2011 to 2022 was calculated based on the BC Health Act (refer to Table 11 enclosed at the end of this report). The future flows will be re-evaluated if further expansion occurs. The resort is committed to continuing the initiative on introducing a storm water infiltration program, flow restrictive devices, and other water consumption measures.

Flow restrictive devices are intended to be utilized in all new construction and the infiltration/rehabilitation program is expected to be ongoing. The intent is to reduce the amount of per unit sewage generation and to reduce the amount of ground and surface water infiltration into the sewer system. FARUC will monitor sewage flows to determine the efficacy of the program.

Based on a report prepared by Urban Systems, Wastewater Treatment Plant Assessment, prepared in October 2017, it was concluded that even with the additional expansion of the proposed Timberlanding, 27 residential lots (Phase 1) possibly in 2018 FARUC may not require an increase to permit discharge above the current limit of 1280 m³/day if the flow restriction measures prove sustainable. Note that Phase 2 development may need a licence amendment to increase the maximum daily flow from 1280 m³ to a maximum plant capacity of 1760 m³. Sewage discharge rates will be monitored and an application will be submitted to increase the maximum daily discharge when warranted.

Phase 1 of the Timberlanding Development, all 27 lots have been sold. 25 lots have been connected or are under construction and 21 out of 25 have been completed and occupied. This phase also includes 4 infill lots on Lower Timberline Crescent. All lots have been included in the calculations for 2023 (Table 11).

Phase 2 Timberlanding development has been registered including 21 family lots and 2 multifamily lots. One home is currently under construction in phase 2. Phase 2 has not been included in the calculations for 2023 yet but will be included in 2024 (Table 11).

Based on the 2022 flow data, the plant has an unused capacity of 488 m³/day due to the flow saving measures. While the levels seem to have rebounded from the Covid-19 restrictions, this still needs to be closely monitored during 2023 and further considered when adding additional development.

Table 4
Projected Peak Flows: 2007-2022

	2007	2008	2009	2010	2011	2012
Estimated Wastewater Flow (m³/day)	979.2	979.9	1032.4	1261.4	1302.3	1302.3
Actual and Corrected (m³/day)	1177 (a)	873 (a)	1178(a)	823 (a)	989 (a)	811 (a)

	2013	2014	2015	2016	2017	2018
Estimated Wastewater Flow (m³/day)	1302.3	1302.3	1302.3	1302.3	1302.3	1337.6
Actual and Corrected (m³/day)	1181 (a)	1036 (a)	1058 (a)	844 (a)	1095 (a)	687 (a)

	2019	2020	2021	2022	2023
Estimated Wastewater Flow (m³/day)	1344.5*	1344.5*	1344.5*	1344.5*	1344.5*
Actual and Corrected (m³/day)	1043 (a)	925 (a)	810 (a)	792 (b)	1049 (b)

*Note that all 27 lots for Timberlanding Phase 1 are included in the Estimated Flow (only 9 including 2 double lots or 11 single lots are either developed, under development or beginning construction)

(a) actual peak flow

(b) corrected daily peak flows by the averaged correction fraction for 2007 to 2022 and correction factor

2007	correction factor of	1177/979.2	1.2
2008		873/979.9	0.89
2009		1178/1032.4	1.14
2010		823/1261.4	0.65
2011		989/1302.3	0.76
2012		811*/1302.3	0.62
2013		1181/1302.3	0.91
2014		1036/1302.3	0.8
2015		1058/1302.3	0.81
2016		844/1302.3	0.65
2017		1095/1302.3	0.84
2018		687/1337.6	0.51
2019		1043/1344.5	0.78
2020		925/1344.5	0.69
2021		810/1344.5	0.60
2022		792/1344.5	0.59
AVERAGE			0.78

*Since only two out of the four months with the historically highest peaks were recorded, this number may be underestimated.

Note that based on the historical data and the above projections the actual flows based on Phase 1 Timberlanding expansion should not exceed the permitted discharge of 1280 m³/d.

Graphs showing estimated vs actual historical peak flows and general trending of the correction factor are shown below.

Figure 7a
 Estimated vs Actual Peak Flows (Historical)

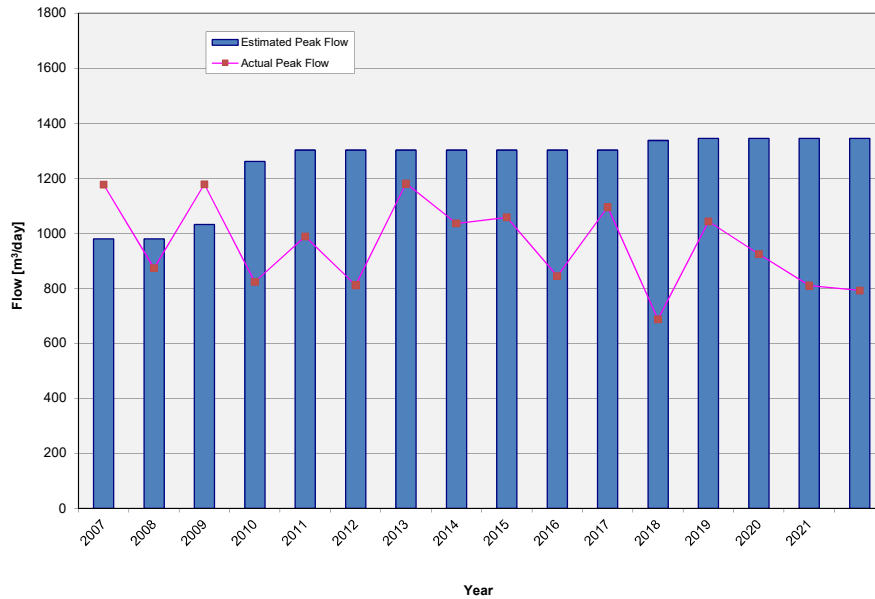
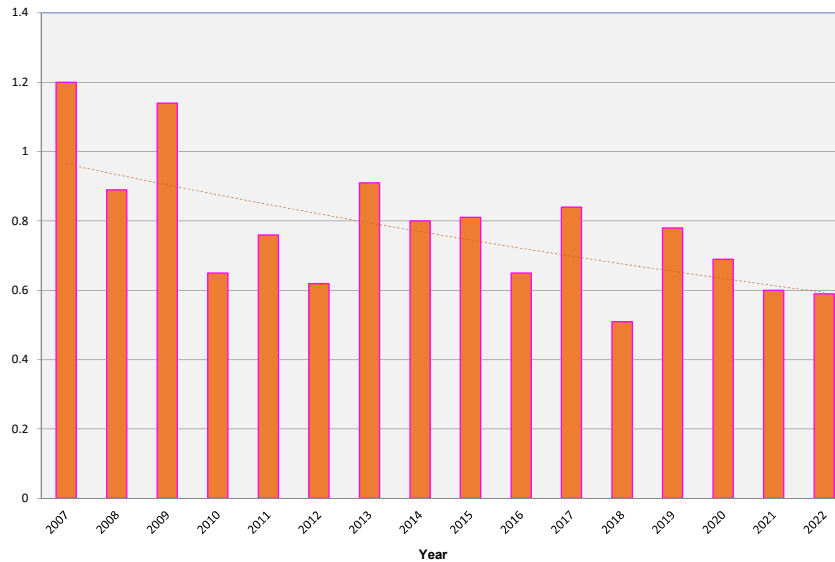


Figure 7b
 Correction Factor and Trendline for Peak Flow (Historical)



5.0 OVERVIEW OF ELK RIVER SAMPLE RESULTS

This section provides data and analysis for the Elk River samples taken during 2022.

Table 5 provides a summary record of the Elk River test results for the time period from December 15th, 2021 to January 25th, 2023.

Table 5
2022 Elk River Sample Results*

#NAME? (yyyy-mm-dd)	Ammonia-N			Ortho-P			Coliform - Fecal			Total P mg/L		
	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN
2021-12-15	0.0052	0.0050	0.0086	0.0044	0.0219	0.0038	8	1	9	0.0059	0.0208	0.0054
2021-12-22	0.0052	0.0127	0.0050	0.0035	0.0690	0.0038	5	27	3	0.0048	0.0713	0.0049
2021-12-29	0.0216	0.0433	-	0.0022	0.0791	-	1	3	-	0.0060	0.0707	-
2022-01-05				RIVER FROZEN								
2022-01-12				RIVER FROZEN								
2022-01-19				RIVER FROZEN								
2022-03-30	0.0060	0.0050	0.0120	0.0010	0.0080	0.0013	4	2	8	0.0142	0.0101	0.0147
2022-04-05	0.0050	0.0050	0.0095	0.0010	0.0065	0.0010	2	13	2	0.0065	0.0123	0.0063
2022-04-13	0.0050	0.0050	0.0050	0.0010	0.0049	0.0010	1	1	2	0.0069	0.0200	0.0065
2022-04-20	0.0050	0.0050	0.0050	0.0010	0.0680	0.0010	3	3	1	0.0063	0.0668	0.0054
2022-04-27	0.0050	0.0050	0.0050	0.0019	0.0151	0.0022	6	1	1	0.0154	0.0226	0.0149
2022-05-03	0.0050	0.0076	0.0050	0.0019	0.0130	0.0024	3	1	2	0.0207	0.0200	0.0205
2022-08-31	0.0071	0.0133	0.0050	0.0010	0.0337	0.0010	8	97	11	0.0047	0.0456	0.0109
2022-09-07	0.0091	0.0206	0.0050	0.0010	0.0176	0.0010	7	5	12	0.0028	0.0816	0.0035
2022-09-15	0.0091	0.0206	0.0050	0.0010	0.0176	0.0010	15	118	19	0.0030	0.0498	0.0060
2022-09-21	0.0082	0.0091	0.0182	0.0010	0.0201	0.0010	1	1	1	0.0030	0.0384	0.0027
2022-09-28	0.0057	0.0112	0.0093	0.0010	0.1300	0.0010	1	1	1	0.0066	0.1860	0.0040
2022-10-05	0.0118	0.0156	0.0050	0.0021	0.0547	0.0019	2	2	1	0.0052	0.0627	0.0032
2022-12-28	0.0050	0.0050	0.0170	0.0044	0.0012	0.0010	58	78	18	0.0146	0.0358	0.0120
2023-01-25	0.0053	0.0054	0.0050	0.0010	0.0057	0.0010	4	1	1	0.0070	0.0133	0.0042
# Samples	17	17	16	17	17	16	17	17	16	17	17	16
Average	0.007	0.011	0.008	0.002	0.031	0.002	8	21	6	0.008	0.048	0.008
Maximum	0.022	0.043	0.018	0.004	0.130	0.004	58	118	19	0.021	0.186	0.021
Minimum	0.005	0.005	0.005	0.001	0.001	0.001	1	1	1	0.003	0.010	0.003

Sample Date (yyyy-mm-dd)	TSS			pH			N-NO ₃			N-NO ₂		
	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN
2021-12-15	3.00	3.00	3.00	8.31	8.18	8.34	1.67	1.59	1.66	0.0025	0.0027	0.0025
2021-12-22	3.00	3.00	3.00	8.23	7.91	8.20	1.50	13.40	1.50	0.0010	0.3910	0.0013
2021-12-29	3.00	3.00	-	8.40	8.23	-	1.69	15.50	-	0.0031	0.0685	-
2022-01-05				RIVER FROZEN								
2022-01-12				RIVER FROZEN								
2022-01-19				RIVER FROZEN								
2022-03-30	8.30	3.00	11.00	8.14	7.88	8.14	1.69	1.40	1.62	0.0010	0.0010	0.0019
2021-04-05	3.00	3.00	3.00	8.31	8.20	8.30	2.24	2.12	2.14	0.0027	0.0010	0.0036
2022-04-13	3.00	7.50	3.10	8.34	8.29	8.34	2.69	0.52	2.60	0.0046	0.0100	0.0018
2022-04-20	4.70	3.00	3.10	7.97	7.64	7.96	2.78	5.33	2.75	0.0027	0.0100	0.0039
2022-04-27	10.20	4.50	9.90	8.31	8.22	8.30	2.35	0.73	2.23	0.0025	0.0013	0.0017
2022-05-03	16.10	4.90	12.50	8.42	8.38	8.43	2.14	1.60	2.06	0.0017	0.0014	0.0014
2022-08-31	3.10	3.00	4.10	8.26	8.41	8.24	1.82	7.51	1.84	0.0015	0.0240	0.0015
2022-09-07	3.00	3.00	3.00	8.40	8.00	8.40	1.83	9.91	1.83	0.0022	0.0568	0.0024
2022-09-15	3.00	3.00	3.00	8.33	7.93	8.30	1.92	13.60	1.94	0.0022	0.0796	0.0022
2022-09-21	3.00	3.00	3.00	8.28	8.34	8.31	1.99	6.31	1.99	0.0025	0.0212	0.0028
2022-09-28	4.00	3.40	4.20	8.28	8.20	8.26	2.15	12.00	2.17	0.0039	0.0284	0.0029
2022-10-05	3.50	3.00	3.00	8.39	8.39	8.40	2.14	10.60	2.14	0.0024	0.0188	0.0024
2022-12-28	3.00	8.30	3.90	7.97	8.03	8.90	0.55	0.10	1.69	0.0013	0.0014	0.0025
2023-01-25	3.00	3.00	3.00	8.30	8.09	8.29	2.02	0.51	2.02	0.0031	0.0010	0.0032
# Samples	17	17	16	17	17	16	17	17	16	17	17	16
Average	4.70	3.80	4.74	8.27	8.14	8.32	1.95	6.04	2.01	0.0024	0.0422	0.0024
Maximum	16.10	8.30	12.50	8.42	8.41	8.90	2.78	15.50	2.75	0.0046	0.3910	0.0039
Minimum	3.00	3.00	3.00	7.97	7.64	7.96	0.55	0.10	1.50	0.0010	0.0010	0.0013

Notes: Light green squares show tests reported at less than the stated value, for calculations these are listed as equal to the value stated, ie. <0.05 is assumed to be 0.05

UP – Upstream

IDZ – Initial Dilution Zone

DN – Downstream

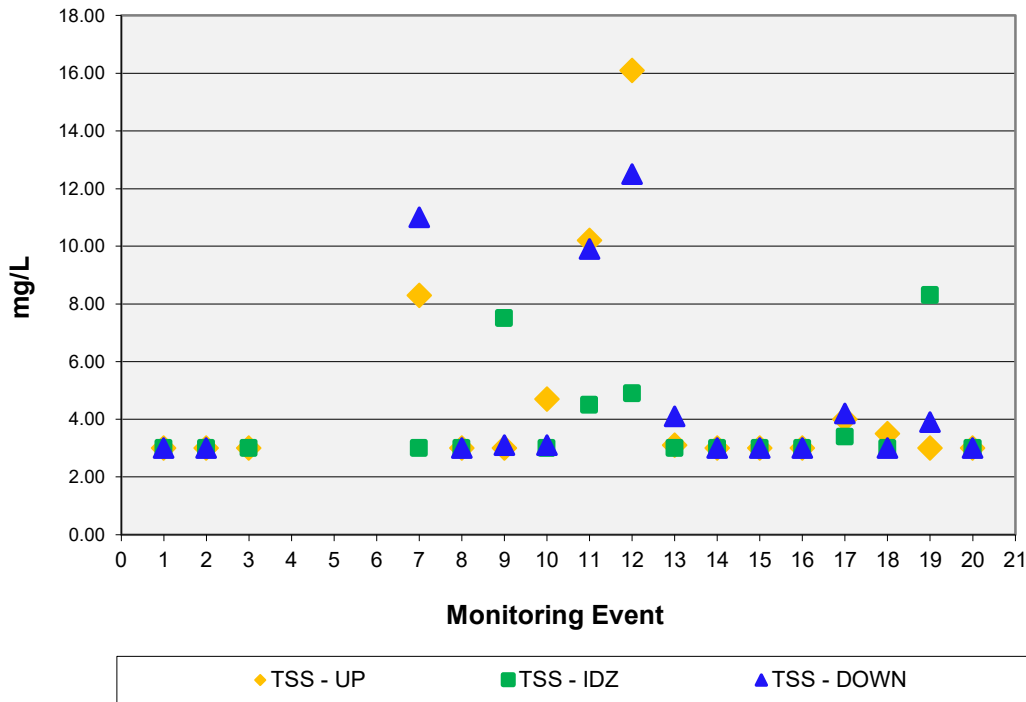
*Note that due to senior position/lead operator changes in the middle of the 2022 several samples were missed. Action has been taken to correct this error. Samples from the end of 2021 and beginning of 2023 were added to capture the winter peak season.

TSS

Outfall results slightly exceeded the upstream (background) results on March 30th, April 13th, August 31st, September 28th and December 28th, 2022 with almost no notable differences other than one monitoring event (March); the results at the outfall were below the detection limits on that day.

Note that there were no changes larger than 5 mg/L between the upstream and downstream values due to the effluent discharge.

Figure 8a
 2022 TSS Results in the River Upstream, at the Outfall and Downstream

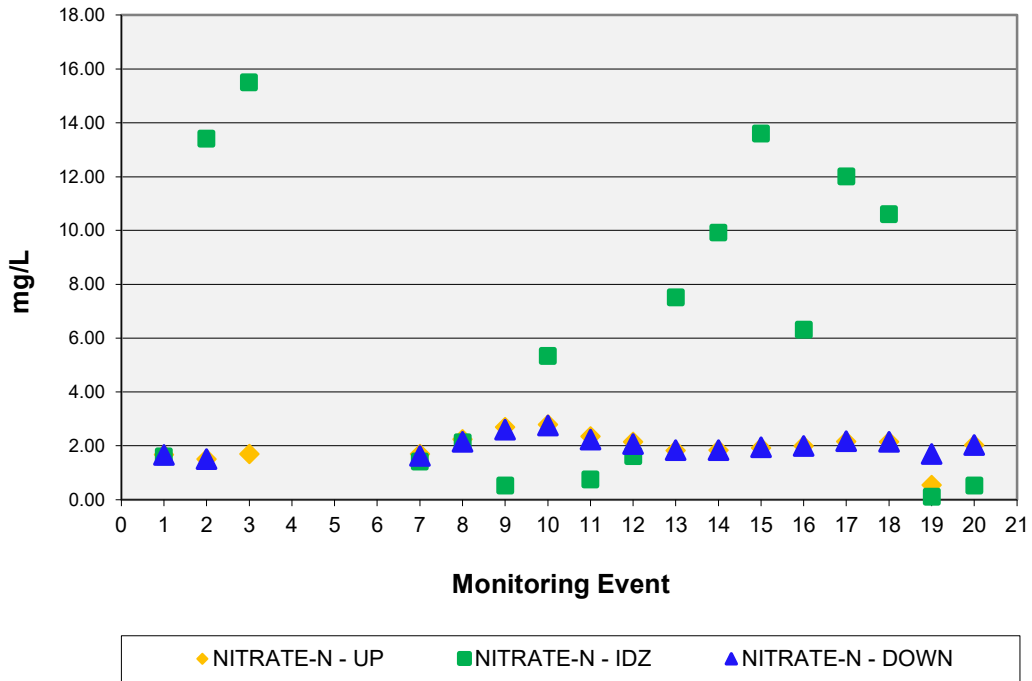


Nitrate-N & Nitrite-N

The highest levels of nitrate-n (15.5 mg/L) were observed at the outfall on December 29th, 2021. The levels of nitrate-n up-stream were much lower on the same day at 1.69 mg/L, there are no results for the downstream. The next highest levels at the outfall (13.6 and 13.4 mg/L) were tested on September 15th, 2022 and December 22nd, 2021 with the results upstream and downstream at 1.92 vs 1.94 mg/L and 1.5 vs 1.5 mg/L (UP vs DOWN), respectively; the level of nitrate-n in the effluent on the December 22nd, 2021 was 40.9 mg/L, which is consistent with or higher than the other samples from the plant effluent and suggests the effluent was not the cause of the elevated nitrate levels at the outfall. Note that all the downstream results were very similar to or below the background levels and within the BC AWQG Long Term Chronic threshold at 3.0 mg/L.

All of the downstream nitrite-n results were very low and below the BC AWQG Long Term Chronic threshold at 0.02 mg/L (the most stringent guideline for chloride < 2 mg/L).

Figure 8b
 2022 Nitrate-N Results in the River Upstream, at the Outfall and Downstream

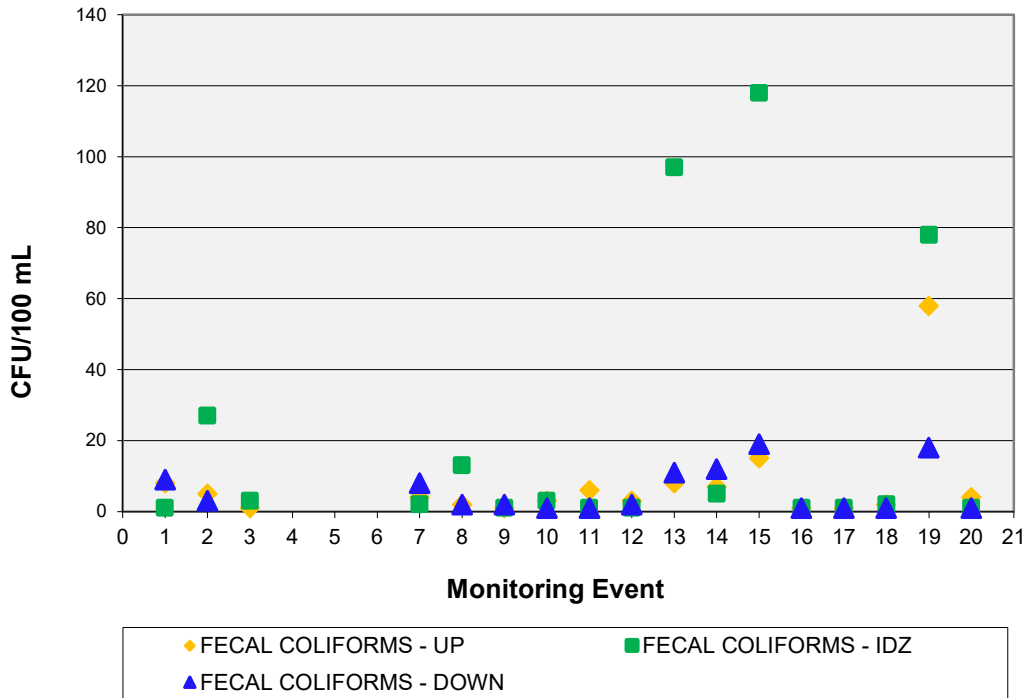


Fecal Coliform

Although very slightly elevated downstream on several monitoring events, the results were very similar to the upstream values. The highest levels at the outfall were recorded on September 15th, 2022 at 118 CFU/100 mL, the results downstream were only slightly elevated above the upstream at 19 CFU/100 mL compared to 15 CFU/100 mL downstream. Similar pattern was observed during the second outflow peak on August 31, 2022 as shown on the Figure below.

The coliform levels in the effluent on the same days were not measured.

Figure 8c
 2022 Fecal Coliform Results in the River Upstream, at the Outfall, Downstream and Effluent



No significant changes were observed in **ammonia-n**, **pH** or **phosphorus** concentrations during any of the river sample periods. Majority of ammonia-n samples downstream were below their detection limits and/or well below the BC AWQG guideline). In general, ortho and total phosphorus were highest in the outfall but the majority of the results from down-stream were below laboratory detection limits and/or within the background (upstream) values.

Overall, the analyzed concentrations remain constant between the upstream (US) sampling zone and the downstream (DS) sampling zone. The data indicates that the plant’s effluent appears not to have any adverse effect on background nutrient concentrations in the Elk River.

pH results in the downstream samples followed closely those in the upstream with no guideline (6.5 – 9.0) exceedance.

6.0 OVERVIEW OF INFLUENT TEST RESULTS

This section provides data and analysis for the plant influent (raw sewage) samples taken during 2022.

Table 6 provides a summary record of the influent test results for the period of January 5, 2022 to December 14, 2022.

Table 6
2022 Influent Results

Date (yyyy/mm/dd)	2022 Influent Results Summary					
	Flow m ³ /d	Temp C	pH	TSS mg/L	BOD mg/L	COD mg/L
2022-01-05	329	-22.0	8.00	242.0	186.0	-
2022-01-12	179	2.0	7.86	198.0	104.0	-
2022-01-19	276	-13.0	8.05	107.0	152.0	-
2022-02-23	348	-24.0	8.08	221.0	222.0	-
2022-03-30	461	7.0	7.92	233.0	80.6	-
2022-04-05	295	2.0	7.79	73.5	70.7	-
2022-04-13	194	4.0	7.92	47.5	41.6	-
2022-04-20	207	-3.0	7.72	51.3	43.0	-
2022-04-27	225	7.0	8.00	50.5	38.9	-
2022-05-03	166	8.0	8.24	52.9	46.7	-
2022-06-15	474	7.0	8.02	30.8	24.1	-
2022-07-14	227	25.0	7.59	133.0	105.0	-
2022-08-24	363	18.0	8.10	110.0	73.4	-
2022-09-21	167	3.0	7.88	78.9	34.6	-
2022-10-19	123	1.0	7.23	187.0	155.0	-
2022-11-23	191	-1.0	7.93	396.0	75.0	-
2022-12-14	226	-7.0	8.06	59.0	79.4	-
# Samples	17	17	17	17	17	0
Average	262	0.8	7.91	133.6	90.1	-
High	474	25	8.24	396.0	222.0	-
Low	123	-24	7.23	30.8	24.1	-

BOD

Inlet BOD ranged from 24.1 mg/L to 222.0 mg/L with an average of 90.1 mg/L. The average influent sewage strength was measured at 106.6 mg/L in 2021, 109.6 mg/L in 2020, 90.0 mg/L in 2019, 102 mg/L in 2018, 114.5 mg/L in 2017, 95.8 mg/L in 2016, 190.1 mg/L in 2015, 92.3 mg/L in 2014, 106 mg/L in 2013, 220 mg/L in 2012, 108 mg/L in 2011, 142 mg/L in 2010, 143 mg/L in 2009, 99 mg/L in 2008 and 488 mg/L in 2007. Since a typical municipal waste water BOD is in the range of 100 to 300 mg/L, it is assumed that the average BOD is well within the expected level.

TSS

TSS values ranged in the influent from 30.8 to 396.0 mg/L with an average of 133.6 mg/L compared to 2021 average at 167.5 mg/L. The highest value was recorded in November. The remaining values fall well within the expected municipal wastewater values between 100 and 350 mg/L.

7.0 OVERVIEW OF EFFLUENT RESULTS

This section provides data and analysis for the effluent (treated) samples and plant flows for 2022.

A total of 382 (plant and laboratory) effluent samples were collected and analyzed for TSS during 2022. The results for 20 samples (18 samples for 2022 and 4 samples for 2021/23) tested in an analytical laboratory for BOD₅, ortho-phosphate, total phosphate, fecal coliforms between December 15th 2021 and January 25th, 2023 are summarized in a table below. 3 samples were laboratory tested for 96-hr LC50 Bioassay.

Effluent samples were collected on the same dates as influent samples to permit an evaluation of plant performance. Table 7 summarizes the laboratory effluent test results for 2022.

Table 7
2022 Effluent Results*

Date (yyyy/mm/dd)	2022 Effluent Results Summary											
	Flow m ³ /d	Temp C	NH ₃ -N mg/L	BOD mg/L	COD mg/L	P-OP04 mg/L	Coliforms Fecal cfu/100ml	Total P mg/L	TSS mg/L	pH	NO ₃ -N mg/L	NO ₂ -N mg/L
2021-12-15	332	-9.0	0.020	2.0	10	0.370	1	0.415	3.0	8.08	26.3	0.012
2021-12-22	521	-3.0	0.047	2.0	16	0.369	41	0.440	3.0	7.52	40.9	2.100
2021-12-29	435	-29.0	0.913	2.0	26	0.305	25	0.310	3.1	8.05	34.2	0.419
2022-01-05	422	-22.0	0.017	2.0	11	0.099	9	0.124	3.0	6.88	40.3	0.011
2022-01-12	269	2.0	0.028	2.0	16	0.227	2	0.222	3.0	7.69	42.5	0.012
2022-01-19	273	-13.0	0.025	2.0	17	0.104	1	0.109	3.0	8.09	39.9	0.008
2022-02-23	440	-24.0	0.009	2.4	-	0.160	19	0.171	3.0	7.74	42.6	0.007
2022-03-30	579	7.0	0.012	2.0	12	0.134	4	0.149	3.0	7.49	30.6	0.134
2022-04-05	387	2.0	0.020	2.5	10	0.067	1	0.078	3.0	7.79	28.0	0.010
2022-04-13	245	4.0	0.005	2.0	10	0.092	2	0.112	3.0	7.99	24.1	0.006
2022-04-20	209	-3.0	0.007	2.0	10	0.123	1	0.134	3.0	7.41	24.2	0.085
2022-04-27	309	7.0	0.007	2.0	10	0.186	1	0.187	3.0	8.09	22.2	0.012
2022-05-03	200	8.0	0.010	2.0	11	0.235	1	0.244	3.0	8.21	21.2	0.009
2022-06-15	646	7.0	0.009	2.0	-	0.310	1	0.321	3.0	8.20	11.2	0.006
2022-07-14	165	25.0	0.010	2.0	-	0.032	2	0.144	3.0	6.78	29.4	0.021
2022-08-24	362	18.0	0.014	2.0	-	0.257	1	0.317	3.0	7.84	31.2	0.018
2022-09-21	201	3.0	0.016	2.0	10	0.113	-	0.132	3.0	8.00	24.2	0.014
2022-10-19	131	1.0	0.015	2.0	-	0.248	1	0.252	3.0	7.87	31.4	0.025
2022-11-23	233	-1.0	0.011	2.0	-	0.128	1	0.146	3.0	8.15	3.8	0.759
2022-12-14	278	-7.0	0.025	10.8	-	0.559	152	0.595	3.0	8.24	27.9	0.007
2023-01-25	-	-	0.011	2.0	14	0.175	1	0.259	3.4	7.57	31.8	0.007
# Samples	20	20.0	21	21	14	21	21	21	21	21	21	21
Average	332	-1.4	0.059	2.5	13	0.204	13	0.231	3.0	7.79	28.9	0.175
High	646	25.0	0.913	10.8	26	0.559	152	0.595	3.4	8.24	42.6	2.100
Low	131	-29.0	0.005	2.0	10	0.032	1	0.078	3.0	6.78	3.8	0.006
Limit	1280	N/A	N/A	45	N/A	0.5	200	1	45	N/A	N/A	N/A
# Over Limit	0	N/A	N/A	0	N/A	1	0	0	0	N/A	N/A	N/A

Notes: 1. Light green squares show tests reported at less than the stated value, for calculations these are listed as equal to the value stated, ie. <0.05 is assumed to be 0.05
2. Geometric mean is used for coliform results

*Note that due to senior position/lead operator changes in the middle of the 2022 several samples were missed. Action has been taken to correct this error. Samples from the end of 2021 and beginning of 2023 were added to capture the winter peak season.

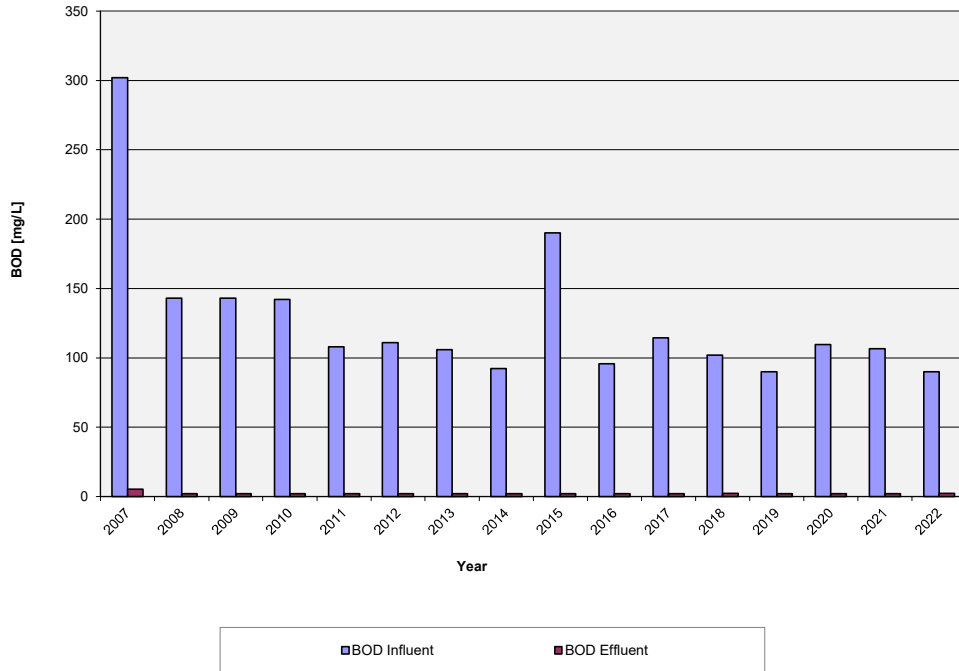
7.1 RESULTS ANALYSIS

BOD

The average BOD in the effluent was 2.4 mg/L in 2022 compared to 2.1 mg/L in 2021, which was low and similar to the previous years (all but three samples were below the detection limit).

Historically, the average BOD was 2.1 in 2020 and 2019, 2.3 mg/L in 2018, 2.2 mg/L in 2015, 5.0 mg/L in 2007 and <2.0 mg/L in 2017, 2016 and between 2008 and 2014. None of the samples were over the limit of 45 mg/L in the effluent.

Figure 9
 Historical BOD Test Results for Influent vs Effluent

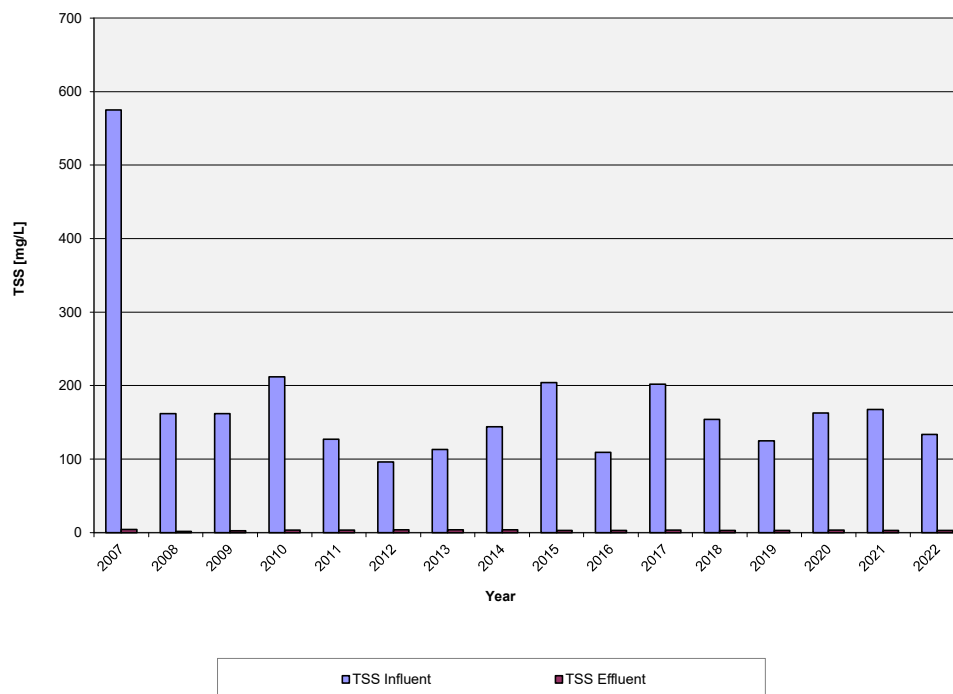


TSS

Laboratory tests indicated that majority of TSS samples in the effluent were below the laboratory detection at <3.0 mg/L, the average at 3 mg/L and the highest result was at 3.4 mg/L.

The plant measured TSS on a daily basis. The highest result measured at the plant was recorded on July 29 and December 12, 2022 at 4.2 mg/L. Average TSS measured at the plant was at 0.4 mg/L (January 1 to December 31, 2022). All the results measured at the plant were well below the discharge limit.

Figure 10
 Historical TSS Test Results for Influent vs Effluent



Based on the above results the plant provides excellent BOD₅ and TSS treatment with average removals of almost 100%.

Fecal Coliforms

Due to the relatively low levels of TSS, UV disinfection was able to effectively control the amount of coliform concentration found in the effluent. The UV disinfection was able to keep the coliform levels well below the acceptable limits for the effluent (200 CFU/100 mL) throughout the year as the maximum levels were at 152 CFU/100 mL.

The levels of coliforms tested in the Elk River outfall and downstream were all low or below the irrigation guideline of 100 CFU/100 mg/L throughout the season.

Ammonia-n

The majority of the effluent ammonia-n concentrations were below the 0.05 mg/L level with the exception of the highest results recorded on December 29th, 2021 at 0.913 mg/L. It should be noted that the results at the discharge on the same date were below the 0.05 mg/L in the river; there is no result for the river downstream for the same day.

All the results in the river downstream were below 0.02 mg/L and well below the freshwater aquatic life guidelines.

Bioassay Toxicity Test

As was the case in previous years, the bioassay toxicity tests in 2022 shows that plant effluent is non-toxic. The results of these tests are shown below in Table 8.

Table 8
Toxicity Test Results

Sample Date	Result
2022/01/12*	Pass
2022/04//13	Pass
2022/09/21	Pass

The levels of ortho-phosphorus were slightly above the discharge limit of 0.5 mg/L in one sample at 0.0559 mg/L. All total phosphorus results were below the discharge limits for 2022.

A phosphorus reduction strategy, as outlined in Section 11, was started in the winter of 2007 to address the removal of soluble phosphorus from the effluent stream. The plant has sufficient infrastructure to remove precipitated nutrients and no additional treatment processes are required.

Phosphorus in the plant effluent has no discernable impact on background nutrient levels in the Elk River, with upstream and downstream concentrations being very similar. A 2001 report by Highwood Environmental indicated that phosphorus releases would have a negligible impact on aquatic life in the Elk River.

FARUC completed plant modifications for phosphorous removal.

7.2 COMPLIANCE SUMMARY

Table 9 summarizes the number of days that samples exceeded MSR effluent requirements.

Table 9
2022 MSR Parameter Compliance

Parameter	Unit	MSR Limit	No. of Samples	Average Value	Max. Value	Samples Over Limit
Flow	m ³ /day	1280	365	311	792	0
BOD ₅	mg/L	45	21 ¹	2.5	10.8	0
TSS	mg/L	45	386 ¹	3 ^{**} (0.4) ^{***}	4.2 ^{***}	0
Total Phosphorous	mg/L	1	21 ¹	0.2	0.6	0
Ortho Phosphate	mg/L	0.5	21 ¹	0.204	0.559	1
Fecal Coliforms*	CFU/100mL	200	21 ¹	13	152	0
96 hr LC ₅₀ Bioassay	/	Non-toxic	3.0	/	/	0

* Limit for recreational waters only, not included in FAR registration letter

** Laboratory tests only (<3 considered at 3 mg/L)

*** Average or maximum value of daily measurements

¹ Only 21 laboratory tests were evaluated in 2022 instead of 25 (17 done in 2022, 3 at the end of 2021 and one at the beginning of 2023)

*Note that due to senior position/lead operator changes in the middle of the 2022 several effluent samples were missed. Action has been taken to correct this error. Samples from the end of 2021 and beginning of 2023 were added to capture the winter peak season.

In 2022, all the samples for BOD, TSS, total phosphorus, and fecal coliforms were below the MSR limits. One sample for ortho-phosphorus slightly exceeded the limits.

8.0 SLUDGE PRODUCTION AND DISPOSAL

This section provides data regarding the disposal of bio-solids (sludge) from the treatment facility in 2022.

Operation of the 200 m³ aerated sludge digester allowed the plant to bag and landfill all of its bio-solids without resorting to vacuum truck services. All solids were transported to the Crowsnest/Pincher Creek Landfill site.

Hauling data for bagged solids are in Table 10.

Table 10
2022 Bagged Solids Data

<i>Month</i>	<i>Vol. Bagged (m³)</i>
<i>January</i>	263
<i>February</i>	218
<i>March</i>	190
<i>April</i>	83
<i>May</i>	33
<i>June</i>	19
<i>July</i>	57
<i>August</i>	103
<i>September</i>	27
<i>October</i>	96
<i>November</i>	115
<i>December</i>	163
Total	1368

The aerated sludge digester has allowed the operators to store liquid sludge during peak winter weekend periods and bag at the less active midweek times, avoiding the need for emergency vacuum truck services. Sludge bag data indicates the winter season is most active for the plant.

Please note, the calculations for bagged solids are being reviewed to ensure consistency.

9.0 BYPASS EVENTS

This section provides information about bypass events in 2022.

Bypass events result in elevated effluent suspended solids concentrations, which decrease the effectiveness of the UV disinfection system; an increase in TSS results in a simultaneous increase in coliform counts. While soluble BOD is removed through the aeration basins, the overflow of TSS also results in an increase in BOD readings due to the presence of biological floc.

There were no bypass events in 2022.

10.0 PLANT IMPROVEMENTS

In January of 2015 the plant was retrofitted with a submersible pump in the Clearwell in order to utilize Clearwell effluent to spray down clarifiers. This was done to rectify the discrepancy between influent and effluent flows and to hopefully reduce the effluent flows. As seen in Figure 1 and Table 3, the influent and effluent flows were very similar and the total effluent and average effluent decreased from 2014.

The continuous strive for the improvements of the Waste Water Treatment System by FARUC will continue along with minimization of the potable water use i.e. clear well water will be used to spray down the clarifiers instead of potable water.

There were no major plant improvements in 2022, however FARUC is currently costing the upgrade of bagger disposal method to a centrifuge.

11.0 PHOSPHORUS REMOVAL

This section describes the phosphorus monitoring and removal strategy being implemented to bring the plant into compliance with effluent limits.

In the winter of 2007, the plant increased chemical dosing with Clearpac to reduce effluent phosphorus concentrations. By late January 2008 sample results showed marked improvement with both ortho and total phosphorus concentrations falling below discharge requirements.

The increased application of Clearpac in 2008, while effective, has been operationally costly; the relationship between chemical dose and nutrient removal will be adjusted for best efficiency.

The monitoring and removal program continued in the summer of 2008 with the plant evaluating additional removal strategies, including:

- Implementation of sampling procedures to measure total phosphorus concentrations at the following locations; auger monster (raw sewage), clarifier supernatant, RBC overflow, mix tank liquor, sand filter filtrate, filter backwash, sludge digester supernatant, and effluent,
- Evaluation of precipitant dose on effluent phosphorous levels at the current chemical addition point (clarifier overflow),
- Evaluation of changing the precipitant dose location, and
- Evaluation of alternative chemicals.

The plant planned to continually monitor and optimize coagulant dosages for improved phosphorus removal.

In 2009 upgrades to the phosphorus injections points and mixing tanks began. In the spring of 2011 the final stage of this improvement was completed with the installation of a rapid mixer and flocculation system and the relocation of the UV system. This resulted in the better usage of tertiary filtration. Longer runs, less backwash water, better phosphorus removal and better effluent quality were to be the result.

2010 data shows further improvement in phosphorus concentrations with only three exceedances for ortho phosphorus (all results for total phosphorus were below the limits) with only a 15% exceedance compared to 2008 results with 50% exceedance and to 2009 with only a 18% exceedance.

2011 data showed further improvement in phosphorus concentrations with only one exceedances for each total phosphorus and ortho-phosphorus, both on July 14th, 2011. The exceedances for ortho phosphorus was only 4% and for total phosphorus was only 13% above the limit with is less than those of previous years.

The 2012 data showed similar results to that of 2011. Two samples exceeded the limit both for ortho phosphorus. The exceedance was 14% on January 5th and 16% on December 27th. It was anticipated that the program will continue to show improvement to plan effluent quality in 2013.

The 2013 data showed slightly elevated results to that of 2012. Six samples exceeded the limit for ortho phosphorus and one for total phosphorus. The exceedance ranged from 4% to 54% for ortho phosphorus and 9% for total phosphorus. The exceedances for ortho phosphorus were observed on January 3rd, January 17th, January 23rd, February 26th, July 30th and December 26th. The exceedance for total phosphorus was observed on January 3rd.

The 2014 data showed slightly lower results than those in 2013. Only one sample for each total and ortho phosphorus were above the limits. The exceedance was 9% for ortho-phosphorus and 40% for total phosphorus. The exceedance for ortho phosphorus was observed on December 21st. The exceedance for total phosphorus was observed on January 16th.

The average total phosphorus and ortho phosphorus for 2015 were slightly lower than in 2014. Three samples exceeded the limit for ortho phosphorus and none for total phosphorus. The exceedances for ortho phosphorus were 22% on January 1st, 3% on January 7th and 19% on December 22nd.

The average total phosphorus and ortho phosphorus for 2016 were similar to previous years. One sample exceeded the limit for ortho phosphorus and one for total phosphorus. The exceedance for ortho phosphorus was 18% December 28th and for total phosphorus was it 23% on December 28th.

The results for total and ortho phosphorus have decreased and during the 2017 season, all the ortho and total phosphorus results were below the discharge limits.

The results for total phosphorus remained low (no days above the discharge limit) for 2018. There was one ortho phosphorus result from March 21st that slightly exceeded the discharge limit (0.703 mg/L vs 0.5 mg/L); however all the remaining results were below the discharge limit for the year.

In 2019 and 2020 the results for total phosphorus remained low and mostly below the discharge limit of 1 mg/L with one ortho-phosphorus exceedance in 2019 and two exceedances in 2020. In 2021, all the results ortho- and total phosphorus were below the discharge limits.

In 2022 there was one exceedance of ortho-phosphorus and no exceedance of total phosphorus.

Figure 11
 Total Phosphorus Levels 2007-2022

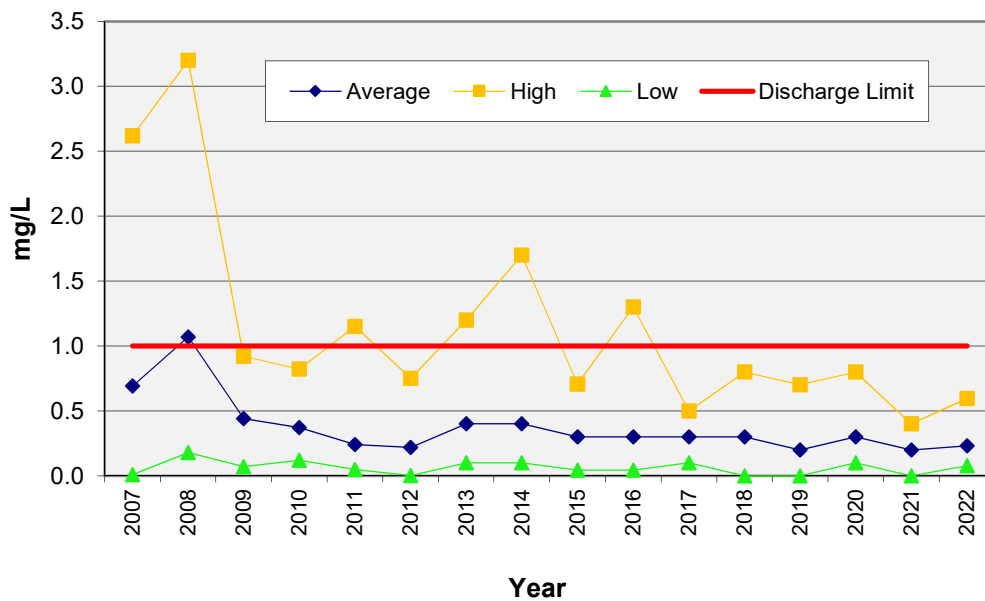


Figure 12
 Ortho Phosphorus Levels 2007-2022

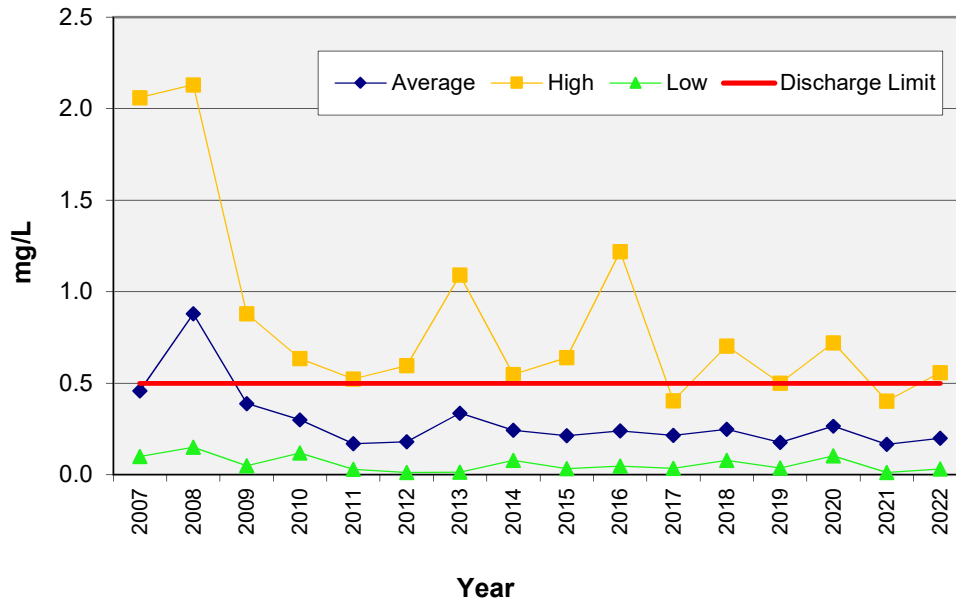
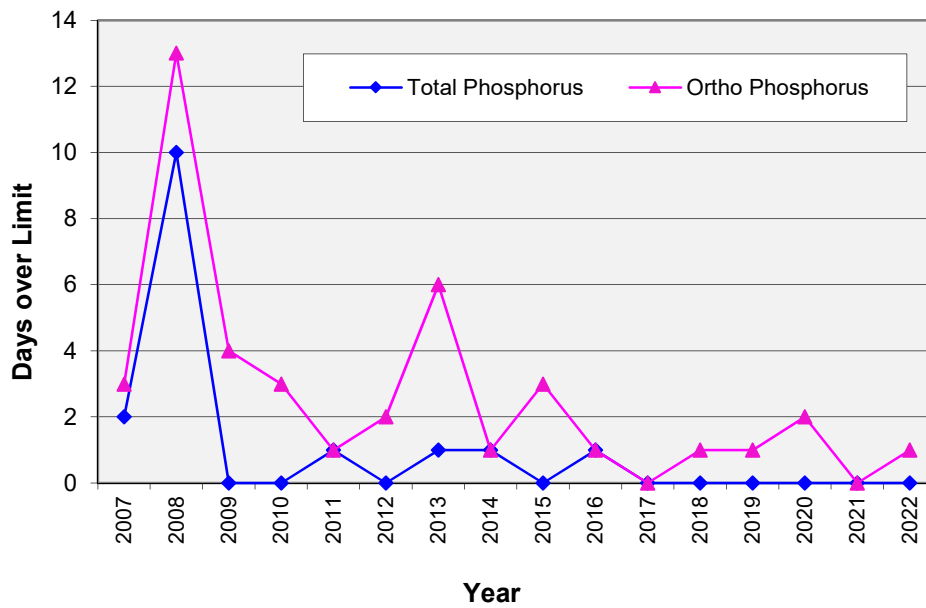
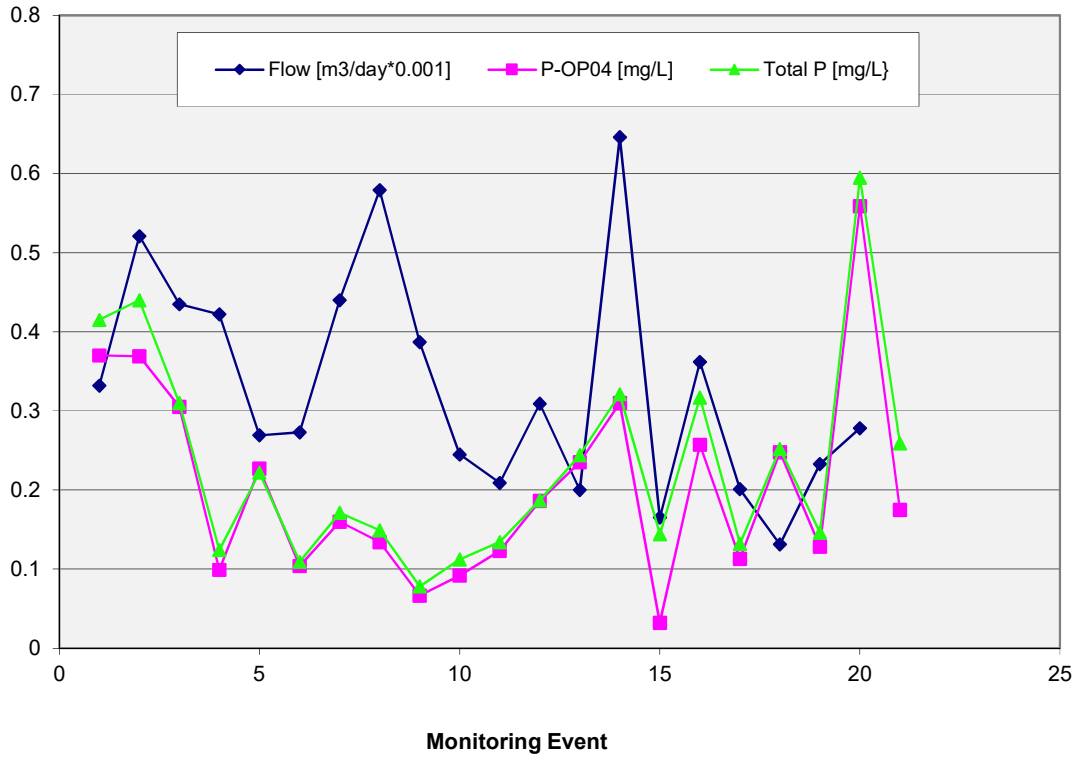


Figure 13
 Days over Limit 2007-2022



Phosphorus and ortho-phosphorus follow relatively closely the effluent flows in the plant as shown on the graph below.

Figure 14
Total Flow and Phosphorus Levels



12.0 ASSESSMENT SUMMARY

In 2022 the number of effluent samples for BOD, total phosphorus, ortho-phosphorus and fecal coliform did not comply with the MSR requirements; however all the results were below the discharge limits with the exception of one ortho-phosphorus result.

Based on the river sample results there does not appear to be any significant adverse impacts to the Elk River from the effluent discharged.

The plant has produced high quality effluent with **BOD₅** normally below the regulated limit of 45 mg/l and the majority of the results at less than 2 mg/L, the highest result was at 10.8 mg/L.

TSS results were less than laboratory detection limit for the majority samples tested and, therefore, below the MSR allowable limits. All daily samples from the plant were also low and below the limits.

Nitrogen

Ammonia-n results in the effluent were low and generally below 0.05 mg/L with the exception of one elevated result detected in December 2021 at 0.913 mg/L. Effluent data shows the plant is effectively oxidizing ammonia nitrogen and that there is no evidence of elevated ammonia levels in the Elk River as a result of discharge from the treatment plant as majority of the downstream results are either below the detection limits or well below the freshwater aquatic guideline.

Nitrate-n values vary between 3.8 and 42.6 mg/L, these values are fairly typical for a municipal wastewater effluent and fairly consistent throughout the years. Nitrite-n values are also very low in the river downstream, similar to the background (upstream levels) and well within the freshwater aquatic guidelines.

Nitrite-n results in the effluent were very low with the results in the river downstream within the background (upstream) values and/or well below the freshwater aquatic guidelines.

Phosphorus and Ortho-phosphorus

There has been a significant decrease in both total phosphorus and ortho-phosphorus concentrations as well as non-compliance events during the last several years. In 2022 all the total phosphorus concentrations were below the discharge limit and one ortho-phosphorus results exceeded the limit only marginally.

Fecal Coliforms

Generally, fecal coliforms in the effluent conformed to the applicable discharge levels throughout the year at 200 CFU/100 mL. The levels in the river downstream were comparable to the upstream and well below the irrigation limits of 100 CFU/100 mL.

Operation of the sludge digester has eliminated the need for emergency liquid sludge hauling. All sludge was bagged and disposed of at the approved landfill site.

FARUC recognizes the requirement to inspect the diffuser (outfall) every five years, an inspection was completed in the summer of 2021 by Urban Systems. FARUC is currently working with Urban Systems on solutions to the recommendations from their inspection and has filed a license review with MOE.

Timberlanding Ph 1 & 2 subdivisions are both constructed and sold out. A capacity report from Urban Systems was submitted and approved by the RDEK for the tying in of the subdivision into the WWTP. Details of the subdivision at build-out include 48 single family lots (27 in the first phase). Phase 1 of the Timberlanding Development consisted of 27 lots. All have been sold and only 2 have not begun construction with 21 completed and occupied. Please note the first phase also includes 4 infill lots on

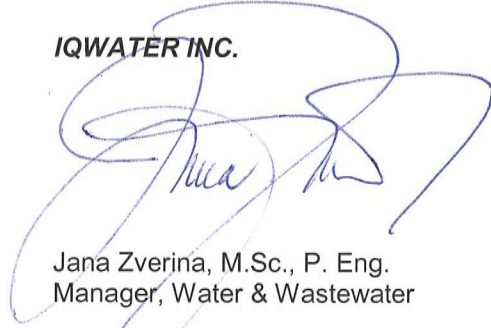
Lower Timberline Crescent. All 4 lots were connected by last year but none have begun any construction. Phase 2 Timberlanding development was registered in sept of 2022 including 21 single family lots and 2 multifamily lots (with a combined bed unit allocation of 397 bed units). Phase 2 has not been included in the calculations (Table 11).

Analysis show sufficient capacity in the WWTP for the development but may require an increase to the maximum allowable daily discharge at build out of Phase 2. Please note that when the WWTP was upgraded in 2005, additional capacity was built into the plant which would allow it to operate to a maximum flow of 1760 m³. In order to utilize this capacity, a license amendment to increase the maximum daily flow from 1280 m³ to 1760 m³ has been submitted. Other upgrades will be required to achieve this capacity.

13.0 AUTHORIZATION AND CLOSING

This report, titled *2022 Sewage Treatment Plant Annual Report*, was prepared for FARUC by IQWATER Inc. The material in this report reflects the best judgement of IQWATER Inc. based on the information available at the time of preparation. Any use that a third party makes of this report, or reliance on or decisions based on it, is the responsibility of the third party. IQWATER Inc. accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions taken based on this report.

IQWATER INC.

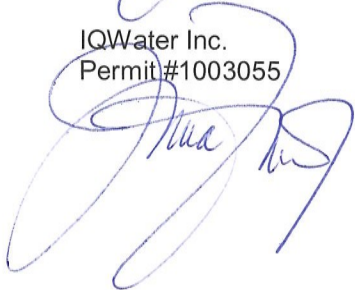


Jana Zverina, M.Sc., P. Eng.
Manager, Water & Wastewater



28/04/2023

IQWater Inc.
Permit #1003055



28/04/2023

iqw/jobs/W2020-019.2022

14.0 REFERENCES

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BC Environmental Management Act, Municipal Wastewater Regulation B.C. Reg. 87/2012, last Amended March 30th, 2022 by B.C. Reg. 76/2022

BC Ministry of Health, Health Protection Branch, Sewerage System Standard Practice Manual, Version 3, September 2014

British Columbia Ministry of Environment and Climate Change Strategy. 2021. British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture - Guideline Summary. Water Quality Guideline Series, WQG-20 (the most recent update April 2023)

Canadian Council of Ministers of the Environment. Canadian Water Quality Guidelines for the Protection of Aquatic Life

Canadian Council of Ministers of the Environment. Canadian Water Quality Guidelines for the Protection of Agricultural Water Uses

Canadian Council of Ministers of the Environment. Protocols Manual for Water Quality Sampling in Canada. 2011

Health Canada. Guidelines for Canadian Drinking Water Quality. September 2022

15.0 TERMS AND CONDITIONS

1. Our reports are prepared to specifically fulfil our Clients' requirements. The conclusions are based on the time limitations and scope of the services provided and information obtained from those services. The Inspector certifies that he/she has no present or contemplated future interest in the inspected property.
2. IQWATER INC. will provide skill, care and diligence in accordance with generally accepted engineering practices and procedures at the time and location in which the services are performed. With time, conditions may change and the interpretation of the findings may be altered.
3. IQWATER INC. cannot assume responsibility for any deficiency, misstatement or inaccuracy in the report resulting from the omissions or misrepresentations of persons providing information to use in the report. Any sketch appearing in or attached to the inspection report, or any statement of dimensions, capacities, quantities, or distances, are approximate and are included to assist the reader in visualizing the property.
4. The contents of the report are for the sole use of the Client. The report is the property of the Client and copies shall only be made by the Client or with the approval of the Client. IQWATER INC. is not responsible for any use of information contained in the report, or any reliance or decisions made based on it by an unauthorized third party.
5. This report represents the conditions investigated and sampled at the time of study. Some of the services performed were based on visual observations of the site and the areas surrounding the site, and our opinion cannot be extended to areas that were unavailable for direct observation.
6. The Client is responsible for all permits, authorization, or consents and giving any required notices that enable EDI to perform the services required.

IQWATER INC. may use any contractor with appropriate recognized professional status or with special skills or knowledge to assist in performing the services, at the expense of the client.
7. Any documents provided to IQWATER INC. from the Client will remain the property of the Client, and upon written request IQWATER INC. will return such documents as soon as possible. Any information or documents obtained by IQWATER INC. while performing the services requested will remain the property of IQWATER INC.
8. IQWATER INC. and the client will take reasonable care to prevent any disclosure of the reports or documents, or any information obtained or contained in the reports prepared by IQWATER INC., unless it is to the persons who require such access to the information in order to discharge their responsibilities to IQWATER INC. or as required by law.
9. This report is not intended to have any direct effect on the value of the property, but rather to provide information on apparent site conditions. The Client acknowledges that IQWATER INC. is not making any recommendations with respect to the purchase, sale, investment, or development of the property; and that all decisions associated therewith are the sole responsibility and liability of the Client. Further, IQWATER INC. assumes no responsibility for matters of legal nature affecting the property or title thereto.
10. Limits of Liability – To the fullest extent permitted by law, and notwithstanding any other provision of the Service Agreement between the Client and IQWATER INC., total liability, in the aggregate, of IQWATER INC. and the IQWATER INC. officers, directors, partners, employees and sub-consultants, and any of them, to the Client and anyone claiming by or through the Client, for any and all claims, losses, costs or damages, including attorneys' fees and costs and expert-witness fees and costs of any nature whatsoever or claims expenses resulting from or in any way related to the Project shall not exceed the limit of IQWATER's insurance in effect at the time of this report.
11. In accepting and using this report the Client agrees to indemnify and hold harmless IQWATER INC., its officers, partners, employees and consultant (collectively IQWATER INC.) from and against any and all claims, suits, demands, liabilities, losses, damages or costs, including reasonable attorney's fees and defence costs arising out of or in any way connected to the findings and results of the proposed work, whether liability arises under breach of contract or warranty, tort, including negligence, strict liability or statutory liability or any other cause of action.
12. IQWATER INC. will exercise due diligence, however, IQWATER INC. will not assume any liability for any damage to any facilities, utilities, ground or above-ground surface infrastructure within or outside the subject property boundary since any sampling if needed is intrusive in nature and damage may have to be done to obtain samples.
13. IQWATER INC. will not assume any responsibility for any actual or perceived loss of business to owner's operations as a result of the work proposed herein.
14. The governing law for this contract will be the Alberta law.
15. All claims of costs, losses, damages, etc. have to be immediately forward to IQWATER INC. insurance.

APPENDIX

Table 11 - Fernie Alpine Resort Estimated Sewage Generation (m3/day)

Existing Development	Flow* (l/unit/day)	Units	2011 Generation (m3/day)	2012 Generation (m3/day)	2013 Generation (m3/day)	2014 Generation (m3/day)	2015 Generation (m3/day)	2016 Generation (m3/day)	2017 Generation (m3/day)	2018 Generation (m3/day)	2019 Generation (m3/day)	2020 Generation (m3/day)	2021 Generation (m3/day)	2022 Generation (m3/day)	2023 Generation (m3/day)	
Griz Inn	1136	45	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	2.3
Wolf's Den	318	42	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	0.6
Cornerstone	1136	26	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	0.8
Timberline Condos	1022	58	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	3.4
Polar Peaks (4-Plex Units)	1136	24	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	0.7
Timberline Single Family & B&B	1363	51	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	3.5
Subtotal		246	250.1	250.1	250.1	250.1	250.1	250.1	250.1	250.1	250.1	250.1	250.1	250.1	250.1	11.3

Infill Units	Flow* (l/unit/day)	Units	2011 Generation (m3/day)	2012 Generation (m3/day)	2013 Generation (m3/day)	2014 Generation (m3/day)	2015 Generation (m3/day)	2016 Generation (m3/day)	2017 Generation (m3/day)	2018 Generation (m3/day)	2019 Generation (m3/day)	2020 Generation (m3/day)	2021 Generation (m3/day)	2022 Generation (m3/day)	2023 Generation (m3/day)	
Timberline Infills	1022	141	144.1	144.1	144.1	144.1	144.1	144.1	144.1	144.1	144.1	144.1	144.1	144.1	144.1	20.3
Timberline Single Family	1363	2	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	0.0
Timberline Infills	1022	106	108.3	108.3	108.3	108.3	108.3	108.3	108.3	108.3	108.3	108.3	108.3	108.3	108.3	11.5
Timberland Multifamily	1022	45	60.0	60.0	60.0	60.0	60.0	60.0	60.0	46.0	46.0	46.0	46.0	46.0	46.0	2.7
Timberland Single Family ¹⁾	1363	59.5	44.3	44.3	44.3	44.3	44.3	44.3	44.3	81.1	81.1	81.1	81.1	81.1	81.1	2.6
Highline Infill	1022	26	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	0.7
Subtotal		379.5	386.0	386.0	386.0	386.0	386.0	386.0	386.0	408.8	408.8	408.8	408.8	408.8	408.8	37.8

Highline Subdivision	Flow* (l/unit/day)	Units	2011 Generation (m3/day)	2012 Generation (m3/day)	2013 Generation (m3/day)	2014 Generation (m3/day)	2015 Generation (m3/day)	2016 Generation (m3/day)	2017 Generation (m3/day)	2018 Generation (m3/day)	2019 Generation (m3/day)	2020 Generation (m3/day)	2021 Generation (m3/day)	2022 Generation (m3/day)	2023 Generation (m3/day)	
Single Family	1363	54	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	73.6	73.6	73.6	73.6	73.6	3.6
Duplexes	1363	10	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	0.1
Parcel 31-Condotel	318	61	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	1.2
Parcel 32-Duplex	1363	16	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	0.3
Parcel 36-Hotel	318	101	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	3.2
Parcel 37-Townhouses	1363	8	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	0.1
Parcel 38-Townhouses	1363	23	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	0.7
Parcel 3- Condominium	1363	12	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	0.2
Parcel 8- Condominium	1363	42	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	2.4
Subtotal		327	269.5	269.5	269.5	269.5	269.5	269.5	269.5	269.5	276.4	276.4	276.4	276.4	276.4	11.9

Day Users	Flow* (l/unit/day)	Population (each)	2011 Generation (m3/day)	2012 Generation (m3/day)	2013 Generation (m3/day)	2014 Generation (m3/day)	2015 Generation (m3/day)	2016 Generation (m3/day)	2017 Generation (m3/day)	2018 Generation (m3/day)	2019 Generation (m3/day)	2020 Generation (m3/day)	2021 Generation (m3/day)	2022 Generation (m3/day)	2023 Generation (m3/day)
Skiers	36	700	252	252	252	252	252	252	252	252	252	252	252	252	252
Subtotal		700	252	252	252	252	252	252	252	252	252	252	252	252	252

Dining Facilities/Bars	Flow* (l/m ² /day)	Area (m2)	2011 Generation (m3/day)	2012 Generation (m3/day)	2013 Generation (m3/day)	2014 Generation (m3/day)	2015 Generation (m3/day)	2016 Generation (m3/day)	2017 Generation (m3/day)	2018 Generation (m3/day)	2019 Generation (m3/day)	2020 Generation (m3/day)	2021 Generation (m3/day)	2022 Generation (m3/day)	2023 Generation (m3/day)
Lizard Creek - Dining	97	54.7	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Lizard Creek - Bar	145	40.4	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Kelseys - Dining	97	204.4	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
Kelseys - Bar	145	65	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Daylodge - Dining	97	358.6	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8
Daylodge - Bar	145	260.7	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8
Mean Bean	97	26.8	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Gabrielles	97	133.8	13	13	13	13	13	13	13	13.0	13.0	13.0	13.0	13.0	13.0
Powder House Inn	97	232.2	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Bears Den	97	62.4	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Subtotal		1439	157.2	157.2	157.2	157.2	157.2	157.2	157.2	157.2	157.2	157.2	157.2	157.2	157.2

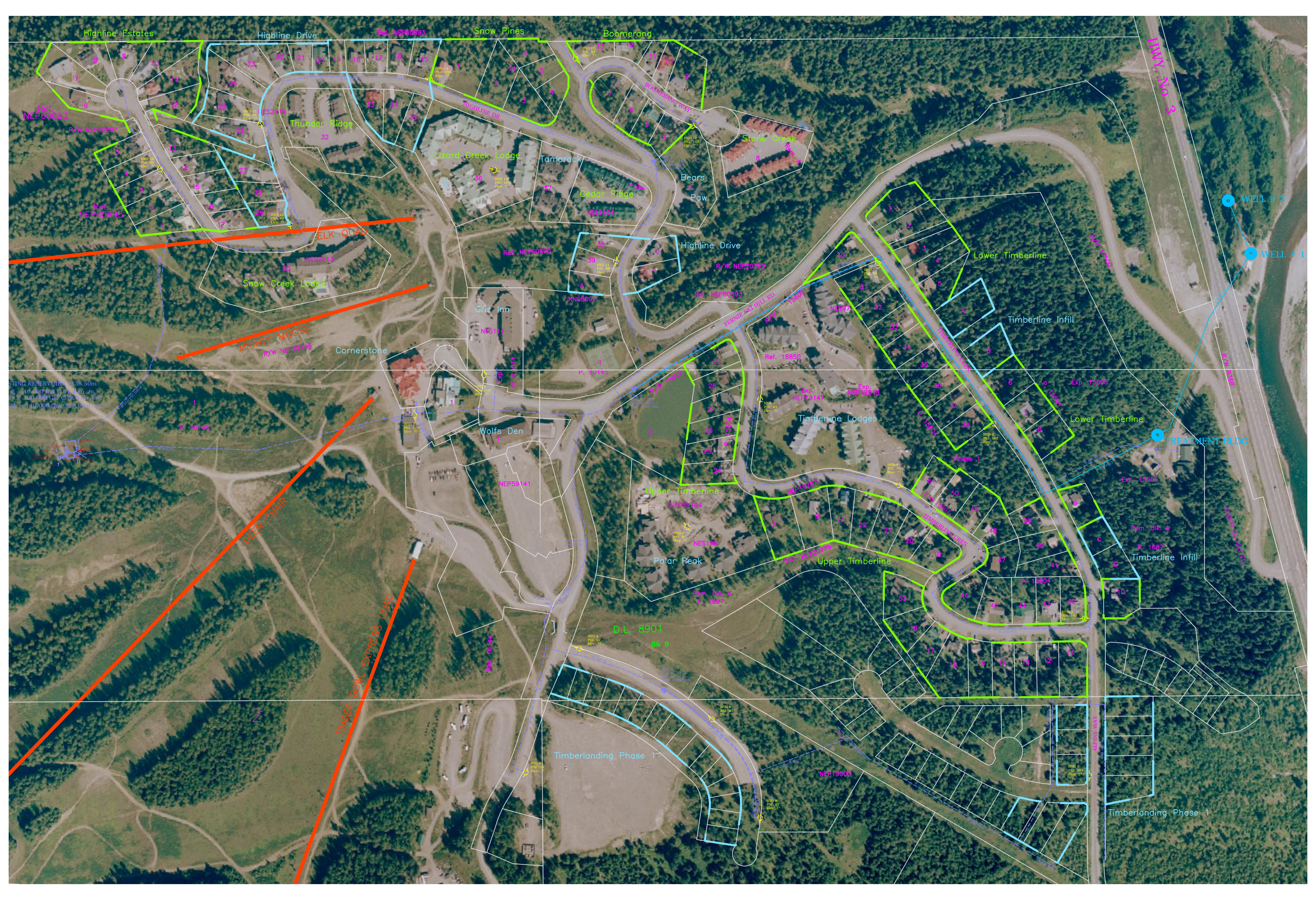
Daily Wastewater Flow (m3/day)*	1302.3	1302.3	1302.3	1302.3	1302.3	1302.3	1302.3	1302.3	1302.3	1337.6	1344.5	1344.5	1344.5	1344.5	1344.5
Corrected Daily Peak Flow Projections**	989 (actual)	811***(actual)	1181 (actual)	1036 (actual)	1058 (actual)	844 (actual)	1095 (actual)	687 (actual)	1043 (actual)	925 (actual)	810 (actual)	792 (actual)	1049 (projected)		

*Estimated Wastewater flows from BC Health Act, Sewage Disposal Regulation

**Based on 2005 flow for peak day flows

*** Note that the number does not reflect a true peak as all the data were not available during high flow months

1) 27 units added for Phase 1 Timberland in 2018 (Phase 2 units will be added for 2024)



Highline Estates Highline Drive Ref. NEP60893 Snow Pines Boomerang

Ref. NEP60893 Thunder Ridge Lizard Creek Lodge Tamarack Boomerang Stone Creek

ELK QUAD Snow Creek Lodge Griz Inn Highline Drive Bears Paw

MIGHTY MOOSE Cornerstone Wolves Den Timberline Lodges Lower Timberline

P. 10145 P. 15604 P. 15604 P. 15604 TREATMENT BLDG

DEER CHAIR Upper Timberline Polar Peak Timberline Lodges Lower Timberline

TIMBER BOWL EXPRESS QUAD Timberling Phase 1 Timberline Lodges Lower Timberline

2 D.L. 5301 Rem. Blk. A P. 1687 Timberline Infill

Timberling Phase 1 NEP19500 Timberling Phase 1

WELL # 2 WELL # 1

STING RESERVOIRS
2 = 40,000 Gal (151.4 cu. m)
1 = 100,000 Gal (378.3 cu. m)
0 = 140,000 Gal (529.9 cu. m)

January 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)											Water Usage (m ³)	Turbidity (NTU)		Independent Testing	
	Reservoir 1	Reservoir 2	New Reservoir	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pp	Spring	River	T. Coliform
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂					
1	1.24	1.06	0.22	0.41	0.25	0.14	0.31	0.67			0.40	478	0.125	0.081		
2	1.20	1.05	0.23	0.32	0.22			0.35	0.79	0.95		521	0.130	0.102		
3	1.27	1.00		0.25	0.22		0.35					291	0.122	0.141		
4	0.81	0.78		0.23		0.77	0.35				0.41	673	0.123	0.126		
5	0.97	0.64	0.24	0.31		0.39	0.74		0.71			460	0.117	0.107		
6	1.09	0.69	0.79	0.39			0.35	0.66	0.72			140	0.118	0.090		
7	1.05	0.72		0.40	0.32		0.60				0.34	625	0.137	0.095		
8	1.00	0.76	0.13	0.37	0.29		0.45	0.66				175	0.130	0.073		
9	1.10	0.67	0.13	0.56	0.34			0.68	0.67	0.77		566	0.122	0.001		
10	0.90	0.73	0.31	0.23	0.28	0.23		0.45				273	0.123	0.022		
11	1.04	0.71	0.26	0.30	0.31		0.55				0.30	262	0.125	0.084		
12	1.20	0.68	0.19	0.13	0.29	0.44		0.72				262	0.476	0.092	< 1 / < 1	< 1 / < 1
13	1.23	0.68	0.25	0.23	0.33			0.63	0.70	0.58		321	0.249	0.095		WWTP, Maintenance
14	1.24	0.56	0.42	0.44	0.37	0.39		0.62			0.39	709	0.180	0.078		
15	0.76	0.74	0.32	0.15	0.42		0.62	0.56				13	0.228	0.126		
16	0.70	0.67	0.29	0.28	0.50			0.59	0.52	0.60		678	0.185	0.061		
17	0.54	0.60	0.24	0.27	0.31	0.24		0.49				35	0.175	0.088		
18	0.71	0.54	0.16	0.22	0.34		0.35	0.53			0.33	299	0.166	0.081		
19	0.69	0.44	0.23	0.24	0.33			0.48	0.40		0.51	260	0.161	0.088	< 1 / < 1	< 1 / < 1
20	1.00	0.64	0.26	0.26	0.32			0.49	0.26	0.49		258	0.169	0.111		Pantry, Lizard Cr
21	1.01	0.65	0.28	0.19	0.26	0.38		0.57			0.41	295	0.154	0.089		
22	1.12	0.61	0.15	0.30	0.23		0.30	0.45				354	0.150	0.087		
23	0.84	0.68	0.30	0.57	0.38			0.61	0.65	0.59		634	0.145	0.077		
24	0.89	0.61	0.20	0.34	0.04	0.49		0.08				243	0.149	0.073		
25	1.04	0.66	0.23	0.25	0.24		0.46	0.56			0.69	197	0.134	0.110		
26	1.02	0.72	0.26	0.37	0.30		0.48	0.55		0.58		322	0.139	0.133	< 1 / < 1	< 1 / < 1
27	1.14	0.72	0.20	0.27	0.34			0.61	0.34	0.39		348	0.137	0.138		Tamarack, Snow Creek
28	1.15	0.74	0.26	0.41	0.42	0.32		0.65			0.40	575	0.140	0.091		
29	1.03	0.76	0.24	0.48	0.50		0.60	0.67				553	0.141	0.132		
30	1.08	0.69	0.26	0.22	0.41			0.53	0.65	0.87		320	0.136	0.085		
31	1.02	0.71	0.21	0.24	0.40	0.24		0.43				616	0.130	0.106		
Average	1.00	0.71	0.26	0.31	0.32	0.37	0.47	0.55	0.58	0.65	0.42	379	0.159	0.092		
Median	1.03	0.69	0.24	0.28	0.32	0.38	0.46	0.57	0.65	0.59	0.40	321	0.139	0.090		
Total												11756			>1	>1

February 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)											Water Usage (m ³)	Turbidity (NTU)		Independent Testing		
	Reservoir 1	Reservoir 2	New Reservoir	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pp	Spring	River	T. Coliform	
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂						
1	0.99	0.64	0.21	0.28	0.36		0.41	0.62				357	0.141	0.113			
2	1.12	0.59	0.26	0.34	0.26	0.44		0.59				356	0.139	0.132	<1 / < 1	< 1 / < 1	WWTP, Maintenance
3	1.31	0.76	0.30	0.14	0.39			0.59	0.36	0.42		270	0.138	0.107			
4	1.19	0.85	0.21	0.35	0.37	0.07		0.43			0.11	348	0.134	0.096			
5	1.34	0.71	0.19	0.11	0.01		0.67	0.71				389	0.130	0.066			
6	1.01	0.73	0.21	0.21	0.37			0.41	0.46	0.42		872	0.135	0.103			
7	1.17	0.39	0.32	0.16	0.36	0.43		0.40				210	0.117	0.063			
8	1.25	0.70	0.20	0.41	0.12		0.34	0.46			0.10	213	0.113	0.065			
9	0.95	0.70	0.26	0.11	0.30			0.50	0.39		0.23	401	0.108	0.060	<1 / < 1	< 1 / < 1	Pantry, Lizard Cr
10	0.68	0.59	0.25	0.24	0.25			0.63	0.26	0.41		441	0.119	0.073			
11	0.73	0.61	0.27	0.12	0.40	0.32		0.55			0.28	556	0.125	0.178			
12	0.86	0.52	0.25	0.39	0.31		0.24	0.53				261	0.118	0.181			
13	1.00	0.65	0.11	0.13	0.42			0.51	0.21	0.39		516	0.111	0.126			
14	0.86	0.54	0.21	0.19	0.19	0.23		0.22				504	0.112	0.146			
15	0.83	0.45	0.23	0.29	0.21		0.48	0.46			0.39	525	0.101	0.112			
16	1.25	0.60	0.20	0.30	0.30		0.43	0.53		0.38		442	0.099	0.119	<1 / < 1	< 1 / < 1	Tamarack, Snow Creek
17	1.35	0.65	0.19	0.17	0.29			0.59	0.31	0.54		409	0.102	0.136			
18	1.26	0.72	0.21	0.26	0.38	0.34		0.62			0.51	266	0.099	0.141			
19	1.25	0.69	0.25	0.36	0.31		0.52	0.41				615	0.101	0.111			
20	1.20	0.74	0.20	0.52	0.41			0.43	0.66	0.43		544	0.109	0.159			
21	0.96	0.59	0.64	0.34	0.39	0.21		0.43				525	0.109	0.101			
22	0.81	0.39	0.38	0.11	0.57		0.68	0.64			0.34	561	0.107	0.207			
23	1.34	0.50	0.20	0.11	0.26	0.33		0.14				593	0.109	0.139	<1 / < 1	< 1 / < 1	WWTP, Maintenance
24	1.55	0.59	0.16	0.50	0.37			0.45	0.55	0.42		416	0.116	0.173			
25	1.49	0.74	0.28	0.21	0.40	0.48		0.64			0.87	600	0.117	0.080			
26	1.34	0.84	0.30		0.34		0.76	0.74				292	0.110	0.070			
27	0.86	0.74	0.39	0.71	0.31			0.34	0.60	0.61		600	0.108	0.094			
28	1.09	1.07	0.32	1.02	0.29	0.32		0.40				618	0.107	0.062			
29																	
30																	
31																	
Average	1.11	0.65	0.26	0.30	0.32	0.32	0.50	0.50	0.42	0.45	0.35	454	0.116	0.115			
Median	1.15	0.65	0.24	0.26	0.33	0.33	0.48	0.51	0.39	0.42	0.31	442	0.112	0.112			
Total												12700			>1	>1	

March 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)											Water Usage (m ³)	Turbidity (NTU)		Independent Testing		
	Reservoir 1	Reservoir 2	New Reservoir	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pp	Spring	River	T. Coliform	
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂						
1	0.90	0.57	0.23		0.14		0.22	0.49			0.38	420	0.581	0.090			
2	1.04	0.48	0.14		0.33			0.44	0.34		0.41	256	0.342	0.113	< 1 / < 1	< 1 / < 1	Pantry, Lizard Creek
3	1.13	0.41	0.34		0.20			0.36	0.31	0.37		607	0.248	0.105			
4	0.70	0.52	0.14		0.31	0.31		0.37			0.42	318	0.817	0.142			
5	0.65	0.52	0.29		0.27		0.34	0.44				514	0.150	0.120			
6	0.52	0.51	0.34		0.32			0.42	0.47	0.68		168	0.279	0.174			
7	0.47	0.43	0.32		0.37	0.34		0.42				386	0.217	0.089			
8	0.61	0.46	0.28		0.26		0.36	0.42			0.48	467	0.173	0.140			
9	1.00	0.51	0.34		0.22		0.46	0.46		0.48		307	0.151	0.141	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
10	1.02	0.69	0.10		0.19			0.55	0.51	0.49		227	0.146	0.131			
11	1.10	0.72	0.37		0.25	0.42		0.38			0.35	306	0.152	0.093			
12	1.24	0.83	0.28		0.34		0.39	0.71				544	0.132	0.098			
13	1.07	0.73	0.22		0.48			0.84	0.45	0.57		420	0.128	0.126			
14	0.94	0.71	0.34		0.39	0.35		0.66				629	0.120	0.122			
15	1.00	0.78	0.31		0.35		0.37	0.66			0.30	564	4.508	0.324			
16	0.92	0.73	0.12		0.42	0.15		0.52				67	0.548	0.334	< 1 / < 1	< 1 / < 1	Wastewater, Maintenance
17	0.90	0.55	0.20		0.41			0.49	0.44	0.42		823	0.498	0.115			
18	0.87	0.53	0.22		0.39	0.33		0.45			0.43	316	0.180	0.100			
19	0.92	0.46	0.18		0.30		0.24	0.41				599	0.160	0.097			
20	0.54	0.54	0.20		0.43			0.39	0.49	0.46		430	0.420	0.102			
21	0.88	0.60	0.22		0.54	0.21		0.44				452	0.193	0.130			
22	0.91	0.71	0.24		0.63		0.56	0.58			0.87	301	0.150	0.136			
23	0.98	0.76	0.23		0.42			0.54	0.54		0.63	311	0.175	0.138	< 1 / < 1	< 1 / < 1	Pantry, Lizard Creek
24	0.95	0.80	0.20		0.30			0.47	0.59	0.65		478	0.892	0.107			
25	0.93	0.68	0.22	0.52	0.39	0.30		0.78			0.43	446	0.426	0.114			
26	0.85	0.73	0.31	0.63	0.38		0.64	0.52				898	0.301	0.130			
27	0.84	0.71	0.26	0.54	0.42			0.44	0.49	0.60		100	0.317	0.065			
28	0.75	0.69	0.05	0.51	0.55	0.26		0.65				409	0.498	0.092			
29	0.52	0.65	0.02	0.45	0.32		0.45	0.46			0.40	54	0.641	0.117			
30	0.56	0.61	0.24	0.36	0.24		0.41	0.48		0.34		724	0.428	0.124	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
31	0.61	0.55	0.22	0.32	0.27			0.52	0.23	0.40		0	0.338	0.207			
Average	0.85	0.62	0.23	0.48	0.35	0.30	0.40	0.51	0.44	0.50	0.46	405	0.462	0.133			
Median	0.90	0.61	0.23	0.51	0.34	0.31	0.39	0.47	0.47	0.48	0.42	420	0.279	0.120			
Total												12541			>1	>1	

April 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)											Water Usage (m ³)	Turbidity (NTU)		Independent Testing		
	Reservoir 1	Reservoir 2	New Reservoir	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pp	Spring	River	T. Coliform	
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂						
1	0.31	0.62	0.26	0.24	0.29	0.32		0.48			0.39	249	0.257	0.117			
2					0.30		0.43	0.46				218	0.138	0.103			
3	0.26	0.55	0.31	0.35	0.53			0.61	0.51	0.62		263	0.178	0.115			
4	0.46	0.49	0.23	0.20	0.48	0.37		0.61				238		0.110			
5	0.96	0.48	0.25	0.22	0.40	0.33		0.45				231	0.178	0.120	< 1 / < 1	< 1 / < 1	
6	1.06	0.62	0.19	0.27	0.41		0.38	0.42			0.33	214	0.173	0.100			
7	1.28	0.82	0.22	0.36	0.40			0.61	0.60	0.45		232	0.150	0.078			
8	0.96	0.94	0.20	0.31	0.31	0.34		0.68			0.56	60	0.189	0.103			
9	1.10	0.90	0.24	0.02	0.32		0.84	0.87				429	0.375	0.072			
10			0.37	0.55	0.51			0.36	0.81	0.75		494	0.203	0.122			
11	0.83	0.75	0.22	0.02	0.10	0.62		0.68				239	0.316	0.073			
12	0.99	0.79	0.31	0.16	0.19		0.53	0.73			0.55	229	0.208	0.099			
13	1.05	0.94	0.32	0.19	0.28			0.80	0.40		0.29	218	0.123	0.096	< 1 / < 1	< 1 / < 1	
14	1.34	0.97	0.24	0.25	0.41			0.71	0.89	0.82		232	0.118	0.106			
15	1.07	1.01	0.34	0.22	0.30	0.37		0.86			0.35	229	0.111	0.125			
16	1.11	0.81	0.40	0.46	0.87		0.95	0.95				267	0.106	0.118			
17	1.12	1.11	0.38	0.03	0.89			0.98	0.82	0.91		363	0.098	0.071			
18	0.69	0.91	0.36	0.23	0.65	0.31		0.79				272	0.111	0.068			
19	0.53	0.72	0.24	0.36	0.22		0.65	0.95				174	0.128	0.100			
20	0.55	0.64	0.31	0.22	0.36		0.41	0.81		0.50		397	0.099	0.171	< 1 / < 1	< 1 / < 1	
21	1.12	0.74	0.27	0.36	0.34			0.68	0.41	0.38		135	0.126	0.064			
22	1.41	0.89	0.30	0.33	0.40	0.40		0.59			0.59	165	0.226	0.097			
23	1.09	0.76	0.29	0.23	0.30			0.00				231	0.242	0.104			
24	0.47	0.67	0.32	0.22	0.27			0.80	0.37	0.60		229	0.304	0.114			
25	0.60	0.54	0.22	0.20	0.34	0.36		0.63				0	0.450	0.120			
26	0.57	0.68	0.40	0.20	0.52		0.63	0.68			0.61	0	0.522	0.119			
27	0.72	0.77	0.37	0.17	0.62			0.54				0	0.550	0.122	< 1 / < 1	< 1 / < 1	
28	0.69	0.75	0.35	0.32	0.59			0.65	0.49	0.51		0	0.414	0.121			
29	0.61	0.60	0.31	0.28	0.27	0.27		0.62			0.54	0	0.340	0.129			
30	0.65	0.49	0.29	0.22	0.44			0.59			0.51	0	0.297	0.123			
31																	
Average	0.84	0.75	0.29	0.25	0.41	0.37	0.60	0.65	0.59	0.62	0.47	200	0.232	0.106			
Median	0.90	0.75	0.30	0.23	0.38	0.35	0.58	0.67	0.51	0.60	0.53	229	0.189	0.108			
Total												6008			>1	>1	

May 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)											Water Usage (m ³)	Turbidity (NTU)		Independent Testing		
	Reservoir 1	Reservoir 2	New Reservoir	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pp	Spring	River	T. Coliform	
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂						
1	0.77	0.78	0.30	0.19	0.46			0.63	0.67	0.75		0	0.305	0.119			
2	0.57	0.68	0.28	0.16	0.59	0.65		0.64				0	0.340	0.115			
3	0.53	0.60	0.31	0.16	0.60			0.70	0.67		0.69	0	0.600	0.116	< 1 / < 1	< 1 / < 1	Lizard Creek, Pantry
4	0.55	0.59	0.29	0.32	0.53		0.47	0.67				275	0.375	0.131			
5	0.86	0.58	0.35	0.26	0.38			0.51	0.57	0.48		207	0.280	0.102			
6	0.99	0.61	0.39	0.23	0.31	0.55		0.48			0.42	223	0.274	0.222			
7	1.28	0.79	0.43	0.56	0.37		0.31	0.58				220	0.185	0.191			
8	0.99	0.85	0.26	0.44	0.29			0.54	0.68	0.59		178	0.196	0.070			
9	0.79	0.76	0.31	0.22	0.36	0.34		0.65				286	0.163	0.091			
10	0.79	0.79	0.29	0.40	0.30		0.37	0.61			0.21	273	0.145	0.083			
11	0.85	0.75	0.32	0.39	0.32			0.64	0.63		0.31	14	0.139	0.126	< 1 / < 1	< 1 / < 1	Lizard Creek, Pantry
12	1.07	0.70	0.36	0.40	0.30			0.60	0.65	0.74		445	0.132	0.053			
13	1.68	1.12	0.39	0.26	0.34	0.37		0.77				14	0.127	0.077			
14	1.28	1.07	0.35	0.33	0.37		0.71	0.71			0.35	1514	0.128	0.061			
15	1.07	1.06	0.42	0.28	0.42			1.04	0.84	0.72		59	0.160	0.083			
16	0.97	1.02	0.29	0.35	0.32	0.37		1.05				212	0.170	0.093			
17	0.87	0.97	0.32	0.26	0.34		0.52	1.05			0.39	0	0.165	0.084			
18	0.88	0.89	0.30	0.19	0.36		0.39	0.95		0.42		198	0.165	0.079	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
19	0.79	0.68	0.35	1.89	0.41			0.90	0.74	0.63		11	0.167	0.299			
20	0.81	0.81	0.35	0.35	0.38	0.18		0.81			0.31	136	0.152	0.074			
21	0.66	0.81	0.32	0.73	0.35		0.40	0.23				110	0.137	0.084			
22	1.24	1.01	0.34	0.22	0.28			0.56	0.51	0.43		408	0.165	0.079			
23	1.22	1.00	0.26	0.29	0.37	0.31		0.51				169	0.147	0.055			
24	0.86	0.97	0.35	0.21	0.33		0.61	0.77			0.42	133	0.158	0.080			
25	0.53	0.73	0.32	0.31	0.57	0.38		0.84				157	0.161	0.059	< 1 / < 1	< 1 / < 1	WWTP, maintenance
26	0.53	0.73	0.23	0.31	0.27			0.93	0.39	0.46		38	0.205	0.081			
27	0.58	0.71	0.26	0.18	0.42	0.23		0.93			0.57	5	0.195	0.381			
28	0.57	0.66	0.27	0.21	0.31		0.61	0.79				197	0.176	0.394			
29	0.99	0.58	0.30	0.23	0.29			0.66	0.31	0.35		217	0.163	0.940			
30	1.01	0.83	0.22	0.27	0.28	0.19		0.66				0	0.154	0.104			
31	0.89	0.72	0.37	0.30	0.30		0.37	0.60			0.19	215	0.160	0.084			
Average	0.89	0.80	0.32	0.35	0.37	0.36	0.48	0.71	0.61	0.56	0.39	191	0.200	0.149			
Median	0.86	0.78	0.32	0.28	0.35	0.36	0.44	0.66	0.65	0.54	0.37	169	0.165	0.084			
Total												5914			>1	>1	

June 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)											Water Usage (m ³)	Turbidity (NTU)		Independent Testing			
	Reservoir 1	Reservoir 2	New Reservoir	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pp	Spring	River	T. Coliform		E. Coli
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂							
1	0.78	0.97	0.27	0.23	0.28			0.58	0.62		0.31	0	0.148	0.084	< 1 / < 1	< 1 / < 1	Lizard Creek, Pantry	
2	0.57	0.71	0.30	0.24	0.76			0.70	0.68	0.52		217	0.149	0.078				
3	0.50	0.31	0.20	0.19	0.21	0.22		0.75			0.42	0	0.143	0.082				
4	0.56	0.60	0.23	0.14	0.30		0.39	0.65				2124	0.142	0.083				
5	0.36	0.51	0.29	0.17	0.27			0.61	0.55	0.44		0	0.134	0.080				
6	0.38	0.40	0.19	0.17	0.30	0.30		0.49				211	0.139	0.103				
7	0.69	0.52	0.22	0.18	0.27		0.40	0.39			0.46	214	0.152	0.123				
8	1.05	0.57	0.28	0.20	0.31		0.42	0.34		0.28		81	0.132	0.079	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek	
9	1.19	0.74	0.29	0.12	0.41			0.54	0.59	0.60		130	0.132	0.900				
10	0.90	0.80	0.21	0.15	0.38	0.39		0.70			0.29	195	0.231	0.987				
11	0.80	0.62	0.19	0.16	0.31		0.49	0.74				246	1.282	0.137				
12	0.38	0.50	0.33	0.14	0.49			0.59	0.88	0.38		312	0.872	0.125				
13	0.47	0.59	0.21	0.18	0.29	0.21		0.50				437	0.385	0.200				
14	0.88	0.69	0.29	0.09	0.30		0.51	0.25			0.16	242	0.879	0.258				
15	0.72	0.64	0.28	0.03	0.28			0.33				261	0.496	0.083	< 1 / < 1	< 1 / < 1	Wastewater, Maintenance	
16	0.27	0.40	0.21	0.13	0.22			0.22	0.42	0.37		190	0.221	0.088				
17	0.77	0.40	0.20	0.14	0.30	0.31		0.34			0.34	202	0.233	0.082				
18	0.86	0.54	0.31	0.15	0.29		0.41	0.27				0	0.259	0.082				
19	0.91	0.76	0.29	0.11	0.44			0.55	0.32	0.29		210	0.172	0.083				
20	0.81	0.76	0.20	0.10	0.42	0.41		0.48				0	0.176	0.083				
21	0.84	0.70	0.29	0.24	0.60		0.74	0.76			0.67	184	0.161	0.105				
22	0.85	0.83	0.19	0.10	0.45							0	0.156	0.102	< 1 / < 1	< 1 / < 1	Lizard Creek, Pantry	
23	0.89	0.72	0.22	0.09	0.39			0.27	0.72	0.65		0	0.151	0.099				
24	0.92	0.75	0.26	0.13	0.30	0.42		0.78			0.62	196	0.148	0.083				
25	0.83	0.60	0.24	0.16	0.42		0.67	0.75				121	0.151	0.073				
26	0.75	0.54	0.20	0.09	0.35			0.70	0.62	0.51		94	0.193	0.090				
27	0.63	0.49	0.14	0.12	0.33	0.28		0.72				200	0.160	0.086				
28	0.83	0.66	0.16	0.08	0.34		0.87	0.70				337	0.145	0.082				
29	0.86	0.67	0.19	0.09	0.22			0.99				244	0.141	0.083				
30	1.18	0.75	0.21	0.24	0.40		0.80	0.74		0.72		218	0.141	0.065				
31																		
Average	0.75	0.62	0.24	0.15	0.35	0.32	0.57	0.57	0.60	0.48	0.41	229	0.267	0.156				
Median	0.81	0.63	0.22	0.14	0.31	0.31	0.50	0.59	0.62	0.48	0.38	198	0.154	0.084				
Total												6866			>1	>1		

July 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)											Water Usage (m ³)	Turbidity (NTU)		Independent Testing		
	Reservoir 1	Reservoir 2	New Reservoir	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pump	Spring	River	T. Coliform	
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂						
1	1.22	0.80	0.28	0.17	0.62	0.42		0.56			0.72	425	0.136	0.065			
2	1.22	0.77	0.20	0.16	0.50		0.72	0.88				252	0.137	0.084			
3	1.40	0.96	0.22	0.11	0.42			0.84	0.80	0.72		661	0.136	0.086			
4	1.40	0.96	0.18	0.19	0.41	0.62		0.51				263	0.137	0.089			
5	0.97	0.62	0.16	0.12	0.50		0.80	0.48		0.72		237	0.141	0.112	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
6	1.08	0.81	0.21	0.12	0.72	0.61		0.43				239	0.135	0.087	< 1 / < 1	< 1 / < 1	Wastewater, Maintenance
7	1.38	0.94	0.14	0.14	0.34			0.85	0.71	0.91		369	0.132	0.063			
8	1.61	0.92	0.02	0.11	0.48	0.18		0.84			0.42	418	0.132	0.060			
9	1.61	0.92	0.20	0.08	0.41		0.62					299	0.133	0.092			
10	1.16	1.07	0.41	0.07	0.38				0.60	0.58		492	0.129	0.075			
11	0.74	0.66	0.03	0.19	0.19	0.22		0.78				116	0.133	0.059			
12	0.67	0.64	0.22	0.09	0.36		0.59	0.34			0.46	419	0.133	0.076			
13	0.65	0.56		0.17	0.40			0.58				533	0.134	0.058	< 1 / < 1	< 1 / < 1	Lizard Creek, Pantry
14	0.89	0.72	0.11	0.12	0.29			0.51	0.70	0.58		479	0.128	0.080			
15	1.09	0.62	0.32	0.09	0.42	0.33		0.40			0.41	479	0.127	0.092			
16	1.21	0.60	0.09	0.12	0.30		0.60	0.42				308	0.134	0.078			
17	0.64	0.10						0.43	0.19	0.21		630	0.131	0.077			
18	1.16	0.62		0.08	0.35	0.39		0.55				511	0.130	0.073			
19	0.73	0.72		0.51	0.31	0.38		0.68			0.54	359	0.135	0.070			
20	1.43	0.82		0.56	0.38	0.38	0.84	0.46		0.52		291	0.139	0.077			
21	2.00	0.94		0.44	0.46	0.37	0.57	0.58		0.78		721	0.141	0.079	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
22	2.20	1.14		0.39	0.50	0.50		0.77			0.55	574	0.140	0.059			
23	2.20	1.25		0.47	0.59	0.46	0.62	0.68				426	0.133	0.078			
24	2.20	1.15		0.53	0.45	0.45		0.85	1.09		0.35	478	0.133	0.060			
25	2.20	1.23		0.52	0.53	0.52	1.12	0.82		0.76		464	0.129	0.083			
26	2.20	0.75		1.03	0.47	0.42		1.04	1.24		0.66	670	0.127	0.075			
27	2.20	1.23			0.46	0.51	0.62	1.06		1.21		785	0.132	0.062	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
28	1.60	1.06		0.57	0.51	0.51		0.59	0.50		0.69	621	0.138	0.109			
29	1.65	1.07		0.60	0.52	0.55	0.45	1.10		1.11		479	0.145	0.074			
30	2.01	1.03		0.31	0.34	0.54		0.62	0.85		0.53	653	0.139	0.082			
31	1.95	1.08		0.67	0.39	0.43	0.53	0.66		0.53		864	0.139	0.073			
Average	1.44	0.86	0.19	0.30	0.43	0.44	0.67	0.67	0.74	0.72	0.53	468	0.134	0.077			
Median	1.40	0.92	0.20	0.17	0.42	0.44	0.62	0.62	0.71	0.72	0.54	478	0.134	0.077			
Total												14515			>1	>1	

August 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)										Water Usage (m ³)	Turbidity (NTU)		Independent Testing		
	Reservoir 1	Reservoir 2	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pp	Spring	River	T. Coliform	
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂						
1	2.09	0.63	0.59	0.43	0.40		0.93	0.99		0.45	758	0.145	0.067			
2	2.14	0.79	0.27	0.40	0.35	0.49	1.00		0.72		819	0.141	0.069			
3	2.06	1.02	0.69	0.42	0.46		1.03	0.84		0.74	367	0.147	0.071			
4	1.92	0.91	0.39	0.54	0.55	0.61	0.57		1.01		339	0.151	0.074	< 1 / < 1	< 1 / < 1	WWTP, River Pump
5	1.82	0.89	0.61	0.47	0.52		0.62	0.80		0.57	538	0.138	0.092			
6	2.20	1.01	0.60	0.54	0.50	0.62	0.64		1.01		603	0.135	0.084			
7	2.20	0.81	0.57	0.50	0.43		0.75	0.93		0.61	804	0.148	0.074			
8	2.20	2.20	0.93	0.58	0.62	1.02	1.09		1.05		409	0.145	0.083	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
9	2.20	2.10	0.52	0.51	0.58		0.64	1.02		0.56	863	0.139	0.077			
10	2.20	1.09	0.46	0.54	0.51	0.74	0.74		0.69		548	0.134	0.092			
11	2.20	1.13	0.55	0.46	0.45		1.23	1.17		0.54	793	0.135	0.076			
12	2.20	1.09	0.86		0.45	0.62	1.08		1.21		545	0.136	0.083			
13	2.20	1.29	0.43	0.53	0.51		0.58	0.68		0.67	749	0.136	0.078			
14	2.20	1.24	0.69	0.61	0.45	0.74	1.26		1.32		629	0.134	0.080			
15	2.20	1.20	0.46	0.46	0.43		1.39	1.31		0.55	568	0.133	0.098			
16	2.20	1.19	0.61	0.46	0.52	0.64			1.12		573	0.333	0.111			
17	2.20	1.22	0.58	0.47	0.55		0.58	0.94		0.58	797	0.137	0.137	< 1 / < 1	< 1 / < 1	WWTP, Shop
18	2.20	1.38	0.70	0.53	0.45	0.53	1.17		0.63		623	0.135	0.093			
19	2.20	1.35	0.48	0.52	0.47		1.41	1.35		0.58	663	0.137	0.080			
20	2.20	1.08	0.73	0.58	0.53	1.28	0.95		0.90		515	0.136	0.096			
21	2.20	1.26	0.91	0.62	0.56		0.79	1.18		0.53	881		0.079			
22	2.20	1.36	0.27	0.45	0.51	0.55	0.79		0.67		653		0.091			
23	2.20	1.27	0.37	0.58	0.52		0.45	0.73		0.73	859		0.100			
24	2.20	1.25	0.54	0.54	0.50	0.89	0.29	0.55	0.70	0.46	365		0.092			
25	2.20	1.18	0.89	0.14	0.50		0.66	0.40		0.86	754		0.089	< 1 / < 1	< 1 / < 1	Pantry, Lizard Cr
26	2.20	1.12	0.63	0.49	0.44	0.60	0.60		0.48		302		0.154			
27	2.20	1.13	0.58	0.55	0.47		0.62			0.65	783		0.091			
28	2.20	0.91	0.37	0.60	0.46	0.60	0.54		0.56		367		0.090			
29	2.20	1.23	0.40	0.56	0.52		0.54	0.52		0.69	624		0.095			
30	2.20	1.30	0.46	0.60	0.53	0.51	0.56		0.65		686		0.095			
31	2.20	0.85	0.30	0.56	0.49		0.52		0.63	0.52	280		0.094	< 1 / < 1	< 1 / < 1	Pantry, Lizard Cr
Average	2.17	1.18	0.56	0.51	0.49	0.70	0.80	0.89	0.83	0.61	615	0.149	0.090			
Median	2.20	1.18	0.57	0.53	0.50	0.62	0.70	0.93	0.71	0.58	624	0.137	0.090			
Total											19057			>1	>1	

September 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)										Water Usage (m ³)	Turbidity (NTU)		Independent Testing		
	Reservoir 1	Reservoir 2	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pp	Spring	River	T. Coliform	
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂						
1	2.20	1.04	0.74	0.53	0.59	0.58	0.52		0.55		751		0.089			
2	2.20	0.90	0.65	0.49	0.51		0.52	0.60		0.69	451		0.080			
3	2.20	1.00	0.75	0.50	0.44	0.75	0.53		0.56		685		0.091			
4	2.20	0.88	0.57		0.49		0.55	0.55		0.67	995		0.098			
5	2.20	0.82	0.39	0.65	0.62	0.63	0.56		0.59		310		0.093			
6	2.20	0.94	0.32		0.51		0.53	0.50		0.61	794		0.091			
7	2.20	0.66	0.70	0.51		0.59	0.50		0.73		359		0.096	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
8	2.20	0.83	0.39	0.57	0.50	0.67	0.50		0.58		644		0.093			
9	2.20	0.71	1.21	0.63	0.51		0.48	0.60		0.65	401		0.079			
10	2.20	0.75	0.70	0.52	0.53	0.70	0.49		0.59		532		0.101			
11	2.20	0.63	0.55	0.58	0.52		0.51	0.57		0.53	374		0.085			
12	2.20	0.62	0.42	0.57	0.50	0.68	0.49		0.60		542		0.095			
13	2.20	0.70	0.55	0.48	0.49		0.46	0.54		0.62	385		0.082			
14	2.20	0.59	0.66	0.46	0.52		0.44				536		0.095			
15	2.20	0.53	0.84	0.44	0.48	0.50	0.42		0.48		251		0.096	< 1 / < 1	< 1 / < 1	WWTP, Shop
16	2.20	0.49	1.21	0.59	0.40		0.42	0.44		0.51	348		0.132			
17	2.20	0.56	0.98	0.45	0.38	0.62	0.45		0.46		469		0.079			
18	2.20	0.52	0.95	0.68	0.52		0.50	0.85		0.92	620		0.096			
19	2.20	0.58	0.68		0.56	0.52	0.50		0.58		287		0.093			
20	2.20	0.47	0.72		0.48		0.54	0.50		0.60	321		0.096			
21	2.20	0.55	0.86	0.64	0.54		0.56	0.58		0.78	303		0.098	< 1 / < 1	< 1 / < 1	Lizard Cr, Pantry, WWTP
22	2.20	0.45	1.17	0.58	0.66	0.77	0.52		0.53		585		0.101			
23	2.20	0.47	0.81	0.78	0.64		0.52	0.55		0.97	240		0.099			
24	2.20	0.52	0.76	0.78	0.55	0.58	0.57		0.70		275		0.097			
25	2.20	0.60	0.82	0.81	0.60		0.61	0.68		0.75	584		0.094			
26	2.20	0.56	0.61	0.72	0.61	0.58	0.60		0.56		346		0.082			
27	2.20	0.64	0.51	0.70	0.59		0.62	0.59		0.82	458		0.093			
28	2.20	0.62	0.63	0.56	0.64	0.53	0.61		0.63		281	0.417	0.092	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
29	2.20	0.78	0.86	0.63	0.65		0.59	0.65		0.78	259	0.368	0.109			
30	2.20	0.62	0.94	0.74	0.71	0.89	0.61		0.59		555	0.339	0.096			
Average	2.20	0.67	0.73	0.60	0.54	0.64	0.52	0.59	0.58	0.71	465		0.094			
Median	2.20	0.62	0.71	0.58	0.52	0.62	0.52	0.58	0.58	0.68	426		0.095			
Total											13941			>1	>1	

October 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)										Water Usage (m ³)	Turbidity (NTU)		Independent Testing		
	Reservoir 1	Reservoir 2	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pp	Spring	River	T. Coliform	
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂						
1	2.20	0.66	0.90	0.67	0.60		0.62	0.65		0.72	246	0.121	0.101			
2	2.20	0.65	0.72	0.62	0.65	0.69	0.64		0.70		597	0.130	0.094			
3	2.20	0.70	0.80	0.60	0.59		0.63	0.71		0.68	263	0.145	0.097			
4	2.20	0.68	0.61	0.62	0.61	0.70	0.63		0.65		241	0.515	0.100			
5	2.20	0.73	0.77	0.77	0.68		0.62	0.59		0.77	265	0.212	0.129	< 1 / < 1	< 1 / < 1	WWTP, Shop
6	2.20	0.71	0.57	0.75	0.67	0.75	0.60		0.74		265	0.119	0.115			
7	2.20	0.75	1.06	0.63	0.65		0.61	0.70		0.86	520	0.150	0.081			
8	2.20	0.83	1.11	0.64	0.68	0.74	0.62		0.70		271	0.130	0.104			
9	2.20	0.68	0.97	0.66	0.70		0.63	0.69		0.81	415	0.128	0.092			
10	2.20	0.66	0.82	0.69	0.64	0.72	0.64		0.68		326	0.125	0.083			
11	2.20	0.76	0.94	0.65	0.65		0.63	0.70		0.76	409	0.119	0.091			
12	2.20	0.79	1.12	0.63	0.71		0.64	0.71		1.00	292	0.147	0.141	< 1 / < 1	< 1 / < 1	Pantry, Lizard Cr
13	2.20	0.80	1.38	0.68	0.71	0.90	0.63		0.73		231	0.137	0.117			
14	2.20	0.85	1.00	0.80	0.71		0.64	0.89		0.84	255	0.156	0.101			
15	2.20	0.89	0.91	0.69	0.69	0.69	0.73		0.82		261	0.134	0.100			
16	2.20	0.89	0.96	0.78	0.72		0.73	0.79		0.80	317	0.135	0.098			
17	2.20	1.00	0.80	0.82	0.75	0.81	0.83		0.80		461	0.146	0.097			
18	2.20	1.10	1.00	0.61	0.73		0.88	0.69		0.71	261	0.149	0.100			
19	2.20	1.30	1.22	0.68	0.91	0.76	0.88		0.89		249	0.140	0.099	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
20	2.20	1.21	0.52	0.66	0.62	0.84	0.98		1.18		85	0.136	0.090			
21	2.20	1.20	0.94	0.57	0.53		1.12	1.20		0.71	279	0.146	0.091			
22	2.20	1.30	0.82	0.53	0.58	1.12	1.13		1.09		179	0.430	0.115			
23	2.20	1.28	0.71	0.49	0.49		1.34	0.92		0.80	486	0.174	0.097			
24	2.20	1.15	0.80	0.47	0.51	0.79	1.46		0.78		253	0.160	0.102			
25	2.20	0.98	0.57	0.39	0.54		1.29	0.72		0.61	234	0.507	0.097			
26	2.20	0.90	0.40	0.44	0.58	0.71	1.21		1.03		229	0.317	0.099	< 1 / < 1	< 1 / < 1	WWTP, Shop
27	2.20	0.90	0.85	0.59	0.55		1.04		0.84	0.59	235	0.244	0.101			
28	2.20	0.80	0.53	0.58	0.59	0.67	0.97	0.85			240	3.197	0.099			
29	2.20	0.76	0.64	0.77	0.56		0.88	0.80		0.67	239	0.597	0.103			
30	2.20	0.74	0.83	0.64	0.48		0.80	0.73		0.56	249	0.237	0.102			
31	2.20	0.73	0.74	0.48	0.48	0.54	0.74		0.54		243	17.010	0.105			
Average	2.20	0.88	0.84	0.63	0.63	0.76	0.83	0.77	0.81	0.74	293	0.845	0.101			
Median	2.20	0.80	0.82	0.64	0.64	0.74	0.73	0.72	0.78	0.74	261	0.147	0.100			
Total											9096			>1	>1	

November 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)										Water Usage (m ³)	Turbidity (NTU)		Independent Testing		
	Reservoir 1	Reservoir 2	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pp	Spring	River	T. Coliform	
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂						
1	2.20	0.80	0.38	0.74	0.48		0.71	0.68		0.64	247		0.248			
2	2.20	0.71	0.56	0.45	0.47		0.65	0.50	0.51	0.56	243		0.280	< 1 / < 1	< 1 / < 1	Pantry, Lizard Cr
3	2.20	0.71	0.81	0.67	0.56	0.66	0.75		0.69		247		0.147			
4	2.20	0.60	0.79	0.54	0.54		0.69	0.70		0.70	236		0.118			
5	2.20	0.61	0.41	0.46	0.36	0.58	0.41	0.50			242		0.144			
6	2.20	0.57	0.92	0.55	0.44		0.65		0.41	0.42	241		0.182			
7	2.20	0.42	0.88	0.50	0.52	0.61	0.61	0.51			241		0.133			
8	2.20	0.57	0.48	0.67	0.47	0.57	0.58				246	0.301	0.145			
9	2.20	0.79	0.37	0.71	0.50	0.53	0.58		0.67		250	0.252	0.125	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
10	2.20	0.93	0.36	0.77	0.51		0.59	0.82		0.80	238	0.230	0.114			
11	2.20	0.89	1.28	0.70	0.55	0.87	0.61		1.40		241	0.218	0.118			
12	1.28	0.82	0.29	0.71	0.50		0.79	0.67		0.61	245	0.211	0.108			
13	1.00	0.59	0.41	0.65	0.44	0.71	0.80	0.50		0.50	256	0.207	0.108			
14	1.04	0.83	0.60	0.60	0.47		0.82	0.56		0.65	246	0.202	0.109			
15	2.60	0.97	0.87	0.51	0.54	0.68	0.74		0.63		245	0.197	0.111			
16	2.60	0.83	0.90	0.57	0.61		0.70	0.60		0.70	241	0.192	0.108	< 1 / < 1	< 1 / < 1	WWTP, Shop
17	2.20	0.76	0.87	0.70	0.49	0.77	0.67				239	0.188	0.105			
18	2.20	0.82	0.58	0.79	0.50	0.74	0.63		0.82		254	0.186	0.107			
19	1.66	0.79	0.59	0.54	0.44		0.60	0.55		0.56	245	0.187	0.119			
20	1.70	0.88	0.83	0.50	0.50	0.56	0.55		0.62		245	0.184	0.109			
21	1.28	0.89	0.40	0.55	0.53		0.72	0.52		0.75	245	0.226	0.106			
22	1.20	0.86	0.58	0.68	0.50	0.71	0.77		0.62		250	0.184	0.104			
23	1.05	0.78	0.57	0.59	0.48		0.65	0.66		0.59	252	0.196	0.110	< 1 / < 1	< 1 / < 1	Pantry, Lizard Cr
24	0.81	0.89	0.53	0.52	0.64	0.83	0.67		0.94		289	0.181	0.105			
25	0.71	0.66	0.46	0.72	0.51		0.61	0.70		0.67	208	0.184	0.105			
26	0.88	0.69	0.39	0.57	0.52	0.66	0.63		0.68		248	0.185	0.106			
27	1.33	0.71	0.40	0.68	0.56	0.71	0.57	0.67		0.64	377	0.186	0.095			
28	1.35	0.72	0.63	0.74	0.50	0.59	0.55		0.52		131	0.180	0.110			
29	1.49	0.77	0.66	0.67	0.60		0.53	0.64		0.65	252	0.193	0.107			
30	1.55	0.81	0.41	0.69	0.47	0.71	0.53		0.54		252	0.182	0.108	< 1 / < 1	< 1 / < 1	Tamarack, Snow Creek
31																
Average	1.74	0.76	0.61	0.62	0.51	0.67	0.65	0.62	0.68	0.64	246	0.202	0.126			
Median	1.95	0.79	0.58	0.66	0.50	0.67	0.65	0.64	0.63	0.65	245	0.192	0.110			
Total											7392			>1	>1	

December 2022 Water Report for Fernie Alpine Resort Utilities Corp.

Day	Chlorine Residual (mg/L)										Water Usage (m ³)	Turbidity (NTU)		Independent Testing		
	Reservoir 1	Reservoir 2	River Pump	WWTP	Shop	Tamarack	Boomerang	Lizard Cr	Snow Creek	Pantry		River Pp	Spring	River	T. Coliform	
	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂	CL ₂						
1	1.48	0.88	0.51	0.54	0.50		0.56	0.69		0.71	363	0.181	0.095			
2	1.29	0.74	0.67	0.53	0.51	0.73	0.57		0.71		336	0.175	0.103			
3	1.68	0.80	0.70	0.52	0.45		0.65	0.64		0.84	195	0.176	0.148			
4	1.64	0.82	0.32	0.48	0.64	0.80	0.68		0.64		429	0.181	0.105			
5	1.46	0.85	0.37	0.52	0.56		0.67	0.71		0.68	264	0.188	0.105			
6	1.66	0.78	0.65	0.60	0.59	0.79	0.67		0.50		258	0.173	0.107			
7	1.33	0.76	0.77	0.64	0.61	0.63	0.66	0.77			493	0.167	0.092	< 1 / < 1	< 1 / < 1	
8	1.40	0.75	0.63	0.53	0.49		0.62		0.69	0.49	267	0.173	0.093			
9	1.53	0.83	0.63	0.51	0.61	0.51	0.63	0.73			300	0.170	0.108			
10	1.66	0.82	0.33	0.54	0.64		0.66		0.78	0.73	250	0.172	0.104			
11	2.20	0.83	0.48	0.73	0.62	1.23	0.64	0.63			493	0.172	0.094			
12	2.20	0.87	0.82	0.53	0.43		0.65		0.56	0.54	416	0.149	0.110			
13	2.20	0.77	1.37	0.57	0.64	0.77	0.65	0.71			238	0.222	0.113			
14	2.20	0.92	0.83	0.77	0.66		0.67	1.24		0.69	258	0.163	0.110	< 1 / < 1	< 1 / < 1	
15	2.20	0.86	0.43	0.65	0.50	0.71	0.62		0.76		329	0.162	0.101			
16	2.20	0.88	0.79	0.58	0.59	0.60	0.70		0.80		557	0.164	0.097			
17	2.20	0.86	0.79	0.51	0.56		0.66	0.80		0.73	184	0.162	0.109			
18	2.20	0.85	0.87	0.34	0.60	0.81	0.73		0.84		560	0.158	0.094			
19	2.20	0.84	0.60	0.37	0.34		0.71	0.67		0.62	343	0.187	0.117			
20	1.85	0.83	0.40	0.31	0.32	0.52	0.72		0.52		303	0.149	0.103			
21	1.68	0.78	0.75	0.57	0.66	0.60	0.61		0.69		422	0.152	0.098	< 1 / < 1	< 1 / < 1	
22	1.65	0.85	0.55	0.75	0.37		0.68	0.44		0.37	444	0.153	0.103			
23	1.33	0.83	0.55	0.70	0.62	0.62	0.69		0.72		297	0.152	0.099			
24	1.20	0.66	0.46	0.67	0.45		0.67	0.65		0.10	734	0.154	0.097			
25	0.65	0.65	0.59	0.65	0.48	0.53	0.56		0.69	0.65	701	0.157	0.095			
26	1.39	0.70	0.75	0.70	0.60		0.61	0.70		0.78	434	0.150	0.112			
27	1.02	0.75	0.75	0.67	0.48	0.68	0.59		0.64		697		0.173			
28	1.10	0.29	0.13	0.15	0.15		0.41	0.07		0.15	426		0.143			
29	1.21	0.39	0.08	0.61	0.63	0.15	0.12		0.51		431		0.118	< 1 / < 1	< 1 / < 1	
30	1.14	0.98	0.13	0.72	0.97		2.50	2.20			944		0.114			
31	1.13	1.44	0.13	0.59	1.82	0.15	1.11				455		0.124			
Average	1.62	0.80	0.58	0.57	0.58	0.64	0.70	0.78	0.67	0.58	414	0.168	0.109			
Median	1.64	0.83	0.60	0.57	0.59	0.63	0.66	0.70	0.69	0.67	416	0.166	0.105			
Total											12821			>1	>1	

WWTP, Shop

Pantry, Lizard Cr

Tamarack (Snow Creek sample was frozen)

WWTP, Shop

Fernie Alpine Resort Water Distribution 2022 Summary

Month	Chlorine Residual (mg/L)														Water Usage (m ³)						Turbidity (NTU)				Independent Testing				
	Reservoir 1 CL ₂		Reservoir 2 CL ₂		River Pump CL ₂		WWTP CL ₂		Shop CL ₂		Tamarack CL ₂		Boomerang CL ₂		Lizard Creek CL ₂		Snow Creek CL ₂		Pantry CL ₂		River Pp			Spring		River		T. Coliform	E. Coli
	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median	Total	Average	Median	Average	Median		
Jan	1.00	1.03	0.71	0.69	0.31	0.28	0.32	0.32	0.37	0.38	0.47	0.46	0.55	0.57	0.58	0.65	0.65	0.59	0.42	0.40	379	321	11756	0.159	0.139	0.092	0.090	>1	>1
Feb	1.11	1.15	0.65	0.65	0.30	0.26	0.32	0.33	0.32	0.33	0.50	0.48	0.50	0.51	0.42	0.39	0.45	0.42	0.35	0.31	454	442	12700	0.116	0.112	0.115	0.112	>1	>1
Mar	0.85	0.90	0.62	0.61	0.48	0.51	0.35	0.34	0.30	0.31	0.40	0.39	0.51	0.47	0.44	0.47	0.50	0.48	0.46	0.42	405	420	12541	0.462	0.279	0.133	0.120	>1	>1
Apr	0.84	0.90	0.75	0.75	0.25	0.23	0.41	0.38	0.37	0.35	0.60	0.58	0.65	0.67	0.59	0.51	0.62	0.60	0.47	0.53	200	229	6008	0.232	0.189	0.106	0.108	>1	>1
May	0.89	0.86	0.80	0.78	0.35	0.28	0.37	0.35	0.36	0.36	0.48	0.44	0.71	0.66	0.61	0.65	0.56	0.54	0.39	0.37	191	169	5914	0.200	0.165	0.149	0.084	>1	>1
June	0.75	0.81	0.62	0.63	0.15	0.14	0.35	0.31	0.32	0.31	0.57	0.50	0.57	0.59	0.60	0.62	0.48	0.48	0.41	0.38	229	198	6866	0.267	0.154	0.156	0.084	>1	>1
July	1.44	1.40	0.86	0.92	0.30	0.17	0.43	0.42	0.44	0.44	0.67	0.62	0.67	0.62	0.74	0.71	0.72	0.72	0.53	0.54	468	478	14515	0.134	0.134	0.077	0.077	>1	>1
Aug	2.17	2.20	1.18	1.18	0.56	0.57	0.51	0.53	0.49	0.50	0.70	0.62	0.80	0.70	0.89	0.93	0.83	0.71	0.61	0.58	615	624	19057	0.149	0.137	0.090	0.090	>1	>1
Sept	2.20	2.20	0.67	0.62	0.73	0.71	0.60	0.58	0.54	0.52	0.64	0.62	0.52	0.52	0.59	0.58	0.58	0.58	0.71	0.68	465	426	13941	N/A	N/A	0.094	0.095	>1	>1
Oct	2.20	2.20	0.88	0.80	0.84	0.82	0.63	0.64	0.63	0.64	0.76	0.64	0.83	0.73	0.77	0.72	0.81	0.78	0.74	0.74	293	261	9096	0.845	0.147	0.101	0.100	>1	>1
Nov	1.74	1.95	0.76	0.79	0.61	0.58	0.62	0.66	0.51	0.50	0.67	0.67	0.65	0.65	0.62	0.64	0.68	0.63	0.64	0.65	246	245	7392	0.202	0.192	0.126	0.110	>1	>1
Dec	1.62	1.64	0.80	0.83	0.58	0.60	0.57	0.57	0.58	0.59	0.64	0.63	0.70	0.66	0.78	0.70	0.67	0.69	0.58	0.67	414	416	12821	0.168	0.166	0.109	0.105	>1	>1
Annual	1.40	1.27	0.78	0.77	0.45	0.40	0.46	0.40	0.43	0.41	0.59	0.60	0.64	0.64	0.64	0.65	0.63	0.60	0.53	0.53	363	369	132607	0.267	0.154	0.112	0.097	no	no

January 2022 WWTP Monthly Report

Date	Weather	Temp. (°C)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	PO ₄ (mg/L)	P-OPO ₄ (mg/L)	PAC L/day	Lab Result		
																TSS mg/L	BOD mg/L	Total P mg/L
			1686535															
						1011038												
1-Jan	snow	-24	1687023	488	1011546	508	0.551	6.6	2.6	12	23	78	0.59	0.19	35.3			
2-Jan	cloud	-9	1687571	548	1012144	598	0.598	5.5	2.6	8	29	66	0.51	0.17	37.4			
3-Jan	snow	-8	1687825	254	1012411	267	0.494	9.3	7.4	21	39	66	0.55	0.18	37.4			
4-Jan	cloud	-15	1688269	444	1012935	524	0.736	8.2	2.8	23	20	67	0.63	0.21	59.8			
5-Jan	cloud	-22	1688598	329	1013357	422	0.444	11.9	2.7	20	22	72	0.27	0.09	59.8	3.0	2.0	0.124
6-Jan	snow	-15	1688971	373	1013699	342	0.874	8.5	4.9	16	24	69	0.41	0.13	52.3			
7-Jan	snow	-5	1689320	349	1014184	485	0.580	12.4	6.1	24	23	74	0.71	0.23	52.3			
8-Jan	cloud	-5	1689580	260	1014483	299	0.480	7.9	3.9	12	26	72	0.48	0.16	52.3			
9-Jan	sun	-1	1689981	401	1014930	447	0.470	8	2.8	12	16	74	0.62	0.20	38.2			
10-Jan	sun	-7	1690282	301	1015281	351	0.345	8.7	7.2	10	17	74	0.42	0.14	38.2			
11-Jan	snow	1	1690545	263	1015520	239	0.525	11	9.4	20	4	74	0.56	0.18	45.7			
12-Jan	rain	2	1690724	179	1015789	269	0.277	11.1	8.4	29	27	75	0.97	0.32	45.7	3.0	2.0	0.222
13-Jan	cloud	1	1691154	430	1016300	511	0.494	14.7	0.8	42	46	52	1.45	0.47	39.8			
14-Jan	cloud	2	1691687	533	1016894	594	0.238	8.6	17.1	29	38	50	0.32	0.10	54.8			
15-Jan	sun	2	1692098	411	1017296	402	0.240	5.1	24.4	11	38	62	0.24	0.08	44.8			
16-Jan	sun	-1	1692529	431	1017819	523	0.296	3.6		11	40	67	0.52	0.17	52.3			
17-Jan	sun	1	1692944	415	1018248	429	0.279	3.4	3.1	8	20	70	0.47	0.15	52.3			
18-Jan	snow	-3	1693215	271	1018583	335	0.209	8.1	11.0	16	27	57	0.47	0.15	49.8			
19-Jan	sun	-13	1693491	276	1018856	273	0.187	8.9	7.4	20	27	62	0.48	0.16	46.1	3.0	2.0	0.109
20-Jan	snow	-5	1693766	275	1019218	362	0.217	10.9	10.1	26	26	64	0.83	0.27	46.1			
21-Jan	sun	-1	1694093	327	1019615	397	0.204	6.8	7.0	12	33	64	0.76	0.25	53.1			
22-Jan	sun	-5	1694346	253	1019909	294	0.228	7.9	4.0	12	33	66	0.80	0.26	45.7			
23-Jan	sun	-7	1694726	380	1020309	400	0.195	6.8	7.7	12	32	67	0.39	0.13	45.7			
24-Jan	cloud	-5	1695125	399	1020780	471	0.295	9.2	4.8	20	26	55	1.05	0.34	45.7			
25-Jan	cloud	-4	1695469	344	1021108	328	0.325	8.8	6.0	12	7	72	0.83	0.27	52.3			
26-Jan	cloud	-9	1695675	206	1021390	282	0.262	10.1	8.4	22	19	72	0.83	0.27	52.3			
27-Jan	cloud	-4	1695997	322	1021687	297	0.208	7.7		12	30	73	0.43	0.14	52.3			
28-Jan	cloud	-3	1696312	315	1022202	515	0.232	8.7	5.6	24	31	64	0.75	0.24	52.3			
29-Jan	sun	-3	1696626	314	1022535	333	0.264	8.5	8.0	23	33	58	0.70	0.23	49.8			
30-Jan	cloud	-1	1697051	425	1022988	453	0.485	6.9	4.3	12	31	61	1.25	0.41	49.8			
31-Jan	snow	-1	1697377	326	1023394	406	0.709	9.1	3.2	19	18	65	2.00	0.65	49.8			
Average		-5.4		350		399	0.39	8.5	6.7	18	27	67	0.69	0.22	48.0			
Median		-4.0		329		400	0.30	8.5	6.0	16	27	67	0.59	0.19	49.8			
Total				10842		12356	N/A	262.9	193.7	550	N/A	N/A	N/A	N/A	1488.6			

February 2022 WWTP Monthly Report

Date	Weather	Temp. (°C)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	PO ₄ (mg/L)	P-OPO ₄ (mg/L)	PAC L/day	Lab Result		
																TSS mg/L	BOD mg/L	Total P mg/L
			1697377	1023394														
1-Feb	cloud	-11	1697760	383	1023819	425	0.186	8.3	1.9	20	11	65	0.28	0.09	59.8			
2-Feb	sun	-25	1697992	232	1024137	318	0.219	10	1.0	20	12	65	0.26	0.08	56.4			
3-Feb	sun	-18	1698242	250	1024452	315	0.207	9.7	5.1	14	28	63	0.38	0.12	41.5			
4-Feb	rain	-4	1698508	266	1024768	316	0.284	8.2	1.0	11	36	64	0.65	0.21	35.3			
5-Feb	sun	-1	1698816	308	1025108	340	0.355	5.8	1.6	12	28	65	0.57	0.19	46.9			
6-Feb	cloud	0	1699217	401	1025579	471	0.489	7.3	0.4	10	24	65	0.95	0.31	46.9			
7-Feb	cloud	-1	1699588	371	1025950	371	0.455	10.5	1.8	29	21	66	0.88	0.29	46.9			
8-Feb	sun	0	1699919	331	1026352	402	0.645	4.3	3.3	4	5	64	1.10	0.36	46.9			
9-Feb	cloud	2	1700126	207	1026558	206	0.450	6.3	1.7	20	21	65	0.67	0.22	35.3			
10-Feb	cloud	3	1700368	242	1026886	328	0.620	5.9	2.4	12	38	44	0.70	0.23	35.3			
11-Feb	sun	1	1700942	574	1027333	447	0.469	5.2	1.1	12	42	43	0.86	0.28	35.3			
12-Feb	sun	-3	1701220	278	1027806	473	0.497	5.1	2.6	12	43	44	1.41	0.46	35.3			
13-Feb	cloud	-6	1701516	296	1028212	406	0.320	7.7	2.0	15	38	45	0.69	0.23	57.7			
14-Feb	cloud	-6	1701906	390	1028619	407	0.280	8.2	2.0	16	35	44	0.54	0.18	57.7			
15-Feb	cloud	-1	1702292	386	1029038	419	0.350	7.7	2.1	15	27	48	0.72	0.23	44.8			
16-Feb	cloud	-1	1702588	296	1029380	342	0.250	7.6	2.9	16	21	49	0.65	0.21	44.8			
17-Feb	cloud	0	1702875	287	1029789	409	0.234	8.7	3.0	16	20	48	0.37	0.12	44.8			
18-Feb	sun	4	1703190	315	1030141	352	0.205	12	5.3	28	37	46	0.39	0.13	44.8			
19-Feb	cloud	4	1703552	362	1030501	360	0.278	7.2	2.5	12	38	47	0.84	0.27	48.6			
20-Feb	snow	-3	1704099	547	1031164	663	0.357	8.2	2.0	15	43	51	1.01	0.33	66.0			
21-Feb	sun	-16	1704620	521	1031735	571	0.790	9.2	3.2	17	37	54	0.90	0.29	68.9			
22-Feb	sun	-20	1705123	503	1032257	522	0.650	6.8	3.4	14	18	54	0.79	0.26	68.9			
23-Feb	sun	-24	1705471	348	1032697	440	0.343	10.5	4.2	18	20	56	0.59	0.19	54.8	3.0	2.0	0.171
24-Feb	sun	-11	1705848	377	1033139	442	0.232	8.8	3.8	15	30	55	0.24	0.08	54.8			
25-Feb	cloud	-11	1706198	350	1033549	410	0.230	6.5	6.3	18	28	58	0.24	0.08	54.8			
26-Feb	cloud	-8	1706549	351	1033936	387	0.217	6.3	1.5		29	62	0.30	0.10	54.8			
27-Feb	snow	-2	1706861	312	1034267	331	0.273	7.6	2.0	11	28	64	0.62	0.20	52.3			
28-Feb	snow	0	1707224	363	1034648	381	0.240	8.3	1.9	20	22	61	0.73	0.24	52.3			
Average		-5.6		352		402	0.36	7.8	2.6	16	28	56	0.65	0.21	49.7			
Median		-2.5		349		404	0.30	7.7	2.1	15	28	56	0.66	0.22	47.7			
Total				9847		11254		217.9	72.0	422					1392.3			

March 2022 WWTP Monthly Report

Date	Weather	Temp. (°c)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	PO ₄ (mg/L)	P-OPO ₄ (mg/L)	PAC L/day	Lab Results		
																TSS mg/L	BOD mg/L	Total P mg/L
			1707224													1034648		
1-Mar	rain	1	1707537	313	1035058	410	0.275	9	2.3	24	30	41	1.60	0.52	52.3			
2-Mar	cloud	2	1708105	568	1035736	678	0.300	8.5	3.0	21	46	41	1.37	0.45	52.3			
3-Mar	snow	-1	1708678	573	1036375	639	0.245	6.3	1.6	15	37	41	0.89	0.29	52.3			
4-Mar	cloud	-3	1709181	503	1036962	587	0.208	2.3	4.0	6	43	47	0.58	0.19	52.3			
5-Mar	cloud	-4	1709725	544	1037563	601	0.205	6.6	2.7	11	26	51	0.52	0.17	52.3			
6-Mar	cloud	-5	1710077	352	1038083	520	0.184	4.6	0.6	9	32	53	1.05	0.34	52.3			
7-Mar	cloud	-2	1710450	373	1038490	407	0.240	7.2	1.3	11	21	54	0.36	0.12	52.3			
8-Mar	cloud	-5	1710903	453	1038835	345	0.187	8.4	1.2	13	17	65	0.70	0.23	52.3			
9-Mar	sun	-17	1711210	307	1039141	306	0.220	8.4	1.6	14	21	63	0.69	0.23	38.2			
10-Mar	cloud	-13	1711493	283	1039537	396	0.224	7.6	2.8	13	23	65	0.23	0.08	38.2			
11-Mar	cloud	-6	1711814	321	1039921	384	0.248	1.6	1.5	2	33	65	0.23	0.08	38.2			
12-Mar	cloud	3	1712157	343	1040264	343	0.272	4.4	0.7	5	38	69	0.35	0.11	38.2			
13-Mar	cloud	-3	1712512	355	1040702	438	0.438	5.1	0.9	12	40	69	1.51	0.49	38.2			
14-Mar	rain	3	1712948	436	1041163	461	0.283	7.4	0.4	22	41	56	1.08	0.35	27.8			
15-Mar	snow	0	1713379	431	1041620	457	0.275	6.3	0.2	10	39	50	0.82	0.27	27.8			
16-Mar	cloud	0	1714113	734	1042412	792	0.314	6.5	4.3	12	32	52	0.83	0.27	27.8			
17-Mar	cloud	5	1714600	487	1043003	591	0.276	5.2	2.4	10	8	54	0.54	0.18	27.8			
18-Mar	rain	2	1714859	259	1043306	303	0.215	5.1	2.0	9	25	56	0.34	0.11	27.8			
19-Mar	cloud	1	1715231	372	1043734	428	0.261	5.6	0.2	12	37	58	0.43	0.14	38.6			
20-Mar	cloud	-1	1715763	532	1044346	612	0.377	6	3.4	9	45	60	1.26	0.41	38.6			
21-Mar	cloud	1	1716293	530	1044907	561	0.333	5.4	1.8	7	33	60	0.68	0.22	53.1			
22-Mar	sun	2	1716740	447	1045420	513	0.365	6.6	0.6	11	22	63	0.66	0.22	38.2			
23-Mar	cloud	3	1717153	413	1045947	527	0.407	6.9	1.1	9	19	63	0.95	0.31	38.2			
24-Mar	cloud	0	1717531	378	1046347	400	0.352	5.2	1.0	15	39	69	0.78	0.25	38.2			
25-Mar	sun	2	1718130	599	1047065	718	0.334	5	1.6	12	44	46	0.57	0.19	50.2			
26-Mar	sun	7	1718721	591	1047739	674	0.385	4.9	2.4	12	23	41	0.90	0.29	50.2			
27-Mar	sun	-2	1719142	421	1048179	440	0.299	6.4	2.2	12	18	45	0.63	0.21	50.2			
28-Mar	cloud	2	1719578	436	1048736	557	0.264	4.9	1.0	12	32	47	0.67	0.22	50.2			
29-Mar	sun	2	1719957	379	1049114	378	0.271	6.6	3.5	12	37	48	0.62	0.20	50.2			
30-Mar	sun	7	1720418	461	1049693	579	0.238	6.2	1.9	12	47	49	0.54	0.18	50.2	3.0	2.0	0.149
31-Mar	sun	3	1720827	409	1050152	459	0.303	10.2	2.4	22	31	51	0.53	0.17	50.2			
Average		-0.5		439		500	0.28	6.1	1.8	12	32	55	0.74	0.24	43.4			
Median		1.0		431		461	0.28	6.3	1.6	12	32	54	0.67	0.22	50.2			
Total				13603		15504		190.4	56.6	376					1344.6			

April 2022 WWTP Monthly Report

Date	Weather	Temp. (°C)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	PO ₄ (mg/L)	P-OPO ₄ (mg/L)	PAC L/day	Lab Result		
																TSS mg/L	BOD mg/L	Total P mg/L
			1720827															
						1050152												
1-Apr	sun	7	1721285	458	1050637	485	0.229	6.3	3.6	11	21	52	0.40	0.13	39.2			
2-Apr	cloud	2	1721647	362	1051094	457	0.223	0.4	1.7		23	55	0.27	0.09	44.1			
3-Apr	cloud	-1	1722002	355	1051490	396	0.344	6.1	0.0	10	22	58	0.51	0.17	4.9			
4-Apr	rain	2	1722409	407	1051930	440	0.308	7.1	2.4	12	4	59	0.62	0.20	44.1			
5-Apr	snow	2	1722704	295	1052317	387	0.228	7.6	5.0	20	34	45	0.43	0.14	44.1	3.0	2.5	0.078
6-Apr	sun	-3	1722955	251	1052623	306	0.195	4.5	1.1	12	27	46	0.20	0.07	44.1			
7-Apr	sun	1	1723276	321	1052988	365	0.224	1.8	0.0		22	48	0.18	0.06	39.2			
8-Apr	sun	6	1723578	302	1053329	341	0.250	0	2.1		19	51	0.20	0.07	34.3			
9-Apr	cloud	1	1723854	276	1053649	320	0.273	0	1.2		25	56	0.36	0.12	29.4			
10-Apr	cloud	0	1724174	320	1054000	351	0.288	6.4	0.0	12	22	59	0.61	0.20	34.3			
11-Apr	sun	-4	1724498	324	1054404	404	0.200	5.4	1.3	12	17	57	0.53	0.17	34.3			
12-Apr	cloud	-5	1724719	221	1054648	244	0.225	4.8	1.0	12	17	58		0.00	24.5			
13-Apr	sun	4	1724913	194	1054893	245	0.272	4.8	1.3	12	14	46	0.43	0.14	29.4	3.0	2.0	0.112
14-Apr	sun	-6	1725198	285	1055179	286	0.219	0	3.4		19	36	0.43	0.14	19.6			
15-Apr	sun	-4	1725395	197	1055406	227	0.228	4.4	0.4	12	23	39	0.35	0.11	24.5			
16-Apr	sun	-1	1725648	253	1055699	293	0.213	0.8	3.1		25	39	0.59	0.19	19.6			
17-Apr	sun	1	1725947	299	1056036	337	0.222	0	2.9	12	25	43	0.64	0.21	29.4			
18-Apr	sun	-4	1726198	251	1056316	280	0.277	3.3	0.8		17	46	0.55	0.18	19.6			
19-Apr	snow	0	1726392	194	1056591	275	0.182	2	0.5		19	47	0.57	0.19	24.5			
20-Apr	sun	-3	1726599	207	1056800	209	0.319	2.6	0.4		19	51	0.63	0.21	24.5	3.0	2.0	0.134
21-Apr	cloud	1	1726825	226	1057086	286	0.172	1	0.1		16	52	0.71	0.23	24.5			
22-Apr	sun	5	1727016	191	1057286	200	0.247	0	0.9		19	53	0.61	0.20	24.5			
23-Apr	cloud	4	1727225	209	1057567	281	2.560	0	1.8		21	55	0.57	0.19	29.4			
24-Apr	sun	4	1727437	212	1057793	226	0.234	0	0.3		23	48	0.50	0.16	24.5			
25-Apr	cloud	8	1727669	232	1058095	302	0.222	4.3	0.0	12	17	42	0.75	0.24	19.6			
26-Apr	rain	3	1727890	221	1058323	228	0.279	3.5	0.1	12	9	42	0.75	0.24	24.5			
27-Apr	sun	7	1728115	225	1058632	309	0.216	1.5	0.0		19	41	0.58	0.19	29.4	3.0	2.0	0.187
28-Apr	sun	7	1728311	196	1058834	202	0.298	0	0.1		21	42	0.77	0.25	24.5			
29-Apr	sun	1	1728528	217	1059104	270	0.267	0	0.0		13	44		0.00	24.5			
30-Apr	sun	4	1728711	183	1059299	195	0.364	3.9	0.4	12	16	46	0.82	0.27	24.5			
														0.00	0.0			
Average		1.3		263		305	0.33	2.8	1.2	12	20	49	0.52	0.16	28.6			
Median		1.0		242		290	0.23	2.3	0.9	12	19	48	0.56	0.18	24.5			
Total				7884		9147		82.5	35.9	173					857.5			

May 2022 WWTP Monthly Report

Date	Weather	Temp. (°c)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	PO ₄ (mg/L)	P-OPO ₄ (mg/L)	PAC L/day	Lab Result		
																TSS mg/L	BOD mg/L	Total P mg/L
			1728711															
						1059299												
1-May	Cloud	4	1728888	177	1059513	214	0.218	2.6	0.5	6	15	46	0.81	0.26	24.5			
2-May	cloud	5	1729058	170	1059749	236	0.365	3.8	0.6	12	14	46	1.41	0.46	19.6			
3-May	sun	8	1729224	166	1059949	200	0.234	5.3		11	10	47	0.89	0.29	34.3	3.0	2.0	0.244
4-May	cloud	5	1729399	175	1060123	174	0.324	3.4		8	4	44	0.69	0.23	39.2			
5-May	rain	8	1729566	167	1060389	266	0.237				8	44	0.71	0.23	39.2			
6-May	cloud	6	1729727	161	1060562	173	0.333				23	46	0.78	0.25	34.3			
7-May	rain	5	1729937	210	1060856	294	0.315	2.1			29	52	0.75	0.24	34.3			
8-May	rain	2	1730152	215	1061091	235	0.448		1.2		28	52	0.73	0.24	29.4			
9-May	snow	1	1730422	270	1061396	305	0.323				28	56	1.09	0.36	34.3			
10-May	cloud	4	1730702	280	1061670	274	0.484	1.7	5.0	5	22	60	1.19	0.39	34.3			
11-May	sun	11	1730955	253	1062023	353	0.690				18	50	1.35	0.44	29.4			
12-May	sun	14	1731203	248	1062230	207	0.196				13	54	0.98	0.32	83.3			
13-May	snow	3	1731332	129	1062419	189	0.146	2.4	2.3	7	14	60	0.91	0.30	29.4			
14-May	sun	6	1731541	209	1062631	212	0.185	1.9	0.9	5	20	43	0.13	0.04	44.1			
15-May	Cloud	6	1731745	204	1062865	234	0.162	1	4.9		17	44	0.42	0.14	24.5			
16-May	Cloud	11	1731926	181	1063097	232	0.267		4.0		11	48	0.41	0.13	34.3			
17-May	Cloud	9	1732069	143	1063285	188	0.180	3.4	0.1	12	17	51	0.22	0.07	29.4			
18-May	Cloud	4	1732218	149	1063421	136	0.292	0.9	2.9		18	49	0.24	0.08	19.6			
19-May	Cloud	6	1732426	208	1063684	263	0.208				23	53	0.26	0.08	14.7			
20-May	Cloud	6	1732647	221	1063889	205	0.307				17	54	0.30	0.10	14.7			
21-May	sun	9	1732882	235	1064193	304	0.204				20	58	0.29	0.09	19.6			
22-May	sun	11	1733117	235	1064423	230	0.235				23	57	0.35	0.11	19.6			
23-May	sun	11	1733299	182	1064665	242	0.264	2.8	2.2	8	26	58	0.40	0.13	14.7			
24-May	sun	8	1733539	240	1064892	227	0.543	1.7	3.7	4	10	60	0.62	0.20	14.7			
25-May	Cloud	9	1733753	214	1065126	234	0.272		2.9		11	50	0.34	0.11	19.6			
26-May	Cloud	8	1733926	173	1065306	180	0.352				10	51	0.51	0.17	9.8			
27-May	rain	9	1734095	169	1065566	260	0.224				9	53	0.59	0.19	19.6			
28-May	Cloud	12	1734330	235	1065821	255	0.261				24	55	0.60	0.20	19.6			
29-May	Cloud	7	1734505	175	1066015	194	0.241	0.4			21	62	0.49	0.16	14.7			
30-May	Cloud	13	1734752	247	1066261	246	0.769		1.7	10	10	64	2.00	0.65	9.8			
31-May	sun	14	1734894	142	1066454	193	0.181		2.8	8	10	64	0.75	0.24	34.3			
Average		7.6		199		231	0.31	2.4	2.4	8	17	53	0.68	0.22	27.2			
Median		8.0		204		232	0.26	2.3	2.3	8	17	52	0.62	0.20	24.5			
Total				6183		7155		33.4	35.7	96					842.8			

June 2022 WWTP Monthly Report

Date	Weather	Temp. (°c)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	PO ₄ (mg/L)	P-OPO ₄ (mg/L)	PAC L/day	Lab Result		
																TSS mg/L	BOD mg/L	Total P mg/L
			1734894				1066454											
1-Jun	sun	10	1735004	110	1066588	134	0.332				2	65	2.65	0.86	19.6			
2-Jun	cloud	15	1735113	109	1066764	176	0.176				10	67	0.68	0.22	19.6			
3-Jun	cloud	14	1735235	122	1066883	119	0.205				15	69	0.12	0.04	14.7			
4-Jun	rain	12	1735388	153	1067048	165	0.185				13	70	0.23	0.08	19.6			
5-Jun	cloud	12	1735538	150	1067214	166	0.258				13	72	0.72	0.23	19.6			
6-Jun	rain	7	1735707	169	1067403	189	0.188	1.5	4.7		20	76	0.70	0.23	24.5			
7-Jun	rain	12	1735891	184	1067690	287	0.626	2.3	6.5	8	22	78	0.44	0.14	19.6			
8-Jun	rain	7	1736101	210	1067923	233	0.202	1.3	1.8		20	60	0.32	0.10	19.6			
9-Jun	sun	8	1736307	206	1068133	210	1.680	2.2	0.3	8	22	61	0.54	0.18	19.6			
10-Jun	cloud	8	1736554	247	1068472	339	0.200	1.6	0.2	4	49	63	0.40	0.13	19.6			
11-Jun	rain	10	1736856	302	1068789	317	1.270				26	64	4.88	1.59	19.6			
12-Jun	cloud	8	1737346	490	1069202	413	0.794				20	66	1.66	0.54	24.5			
13-Jun	rain	10	1737746	400	1069616	414	0.686				8	67	1.65	0.54	14.7			
14-Jun	rain	4	1738105	359	1070054	438	0.327	0.9	0.9		33	69	1.74	0.57	14.7			
15-Jun	cloud	7	1738579	474	1070700	646	0.281				11	71	0.84	0.27	19.6	3.0	2.0	0.321
16-Jun	cloud	7	1738808	229	1070890	190	0.336				19	71	0.92	0.30	29.4			
17-Jun	cloud	18	1738997	189	1071206	316	0.237	1.8	2.7		22	72	0.71	0.23	39.2			
18-Jun	sun	10	1739232	235	1071428	222	0.199				27	46	0.80	0.26	49.0			
19-Jun	sun	15	1739565	333	1071846	418	0.372				21	48	0.37	0.12	39.2			
20-Jun	sun	12	1739692	127	1071960	114	0.209	1.1	8.8	8	21	50	0.85	0.28	19.6			
21-Jun	cloud	10	1739842	150	1072263	303	0.187				21	52	0.41	0.13	24.5			
22-Jun	cloud	17	1740126	284	1072502	239	0.168				17	54	0.50	0.16	73.5			
23-Jun	sun	15	1740304	178	1072654	152	0.173				10	76	0.05	0.02	14.7			
24-Jun	cloud	15	1740480	176	1072825	171	0.190				25	62	0.19	0.06	19.6			
25-Jun	sun	17	1740728	248	1073096	271	0.230	3	2.5	12	24	56	0.96	0.31	9.8			
26-Jun	sun	24	1741044	316	1073515	419	0.200				18	58	0.61	0.20	34.3			
27-Jun	sun	20	1741229	185	1073718	203	0.257				7	59	0.21	0.07	14.7			
28-Jun	sun	20	1741428	199	1073890	172	0.204				18	63	0.39	0.13	29.4			
29-Jun	cloud	14	1741672	244	1074152	262	0.249				13	66	0.11	0.04	29.4			
30-Jun	sun	13	1741893	221	1074363	211	0.225	3.6	5.0	8	8	67	0.07	0.02	24.5			
Average			12.4	233		264	0.36	1.9	3.3	8	19	64	0.82	0.27	24.7			
Median			12.0	208		228	0.23	1.7	2.6	8	20	66	0.58	0.19	19.6			
Total				6999		7909		19.3	33.4	48					739.9			

July 2022 WWTP Monthly Report

	Weather	Temp. (°C)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	PO ₄ (mg/L)	P-OPO ₄ (mg/L)	PAC L/day	Lab Result		
																TSS mg/L	BOD mg/L	Total P mg/L
			1741893				1074363											
1-Jul	sun	18	1742136	243	1074692	329	0.264	1.4	3.3	4	34	69	0.26	0.08	24.5			
2-Jul	sun	19	1742454	318	1074995	303	0.267				43	71	0.60	0.20	34.3			
3-Jul	rain	14	1742897	443	1075507	512	0.650				42	73	1.03	0.34	53.9			
4-Jul	cloud	15	1743274	377	1075865	358	0.215	1.8	1.5	8	18	68	0.34	0.11	44.1			
5-Jul	sun	16	1743513	239	1076207	342	0.455	1.6	6.0	4	34	56	0.40	0.13	19.6			
6-Jul	cloud	10	1743801	288	1076467	260	0.151	2	1.7		37	46	0.31	0.10	49.0			
7-Jul	sun	21	1744084	283	1076772	305	0.245	1.1	4.7		27	48	0.41	0.13	34.3			
8-Jul	sun	21	1744365	281	1077056	284	0.163		7.2		23	52	0.23	0.08	34.3			
9-Jul	sun	22	1744620	255	1077366	310	0.285				26	56	0.32	0.10	29.4			
10-Jul	cloud	20	1744926	306	1077692	326	0.437				29	59	0.50	0.16	44.1			
11-Jul	sun	28	1745207	281	1078075	383	0.660				19	61	0.37	0.12	29.4			
12-Jul	sun	27	1745502	295	1078394	319	0.281				13	62	0.31	0.10	39.2			
13-Jul	cloud	20	1745755	253	1078678	284	0.654				4	65	0.90	0.29	29.4			
14-Jul	sun	25	1745982	227	1078843	165	0.183				20	87	0.82	0.27	39.2	3.0	2.0	0.144
15-Jul	sun	27	1746246	264	1079148	305	0.319				16	85	0.30	0.10	34.3			
16-Jul	sun	14	1746489	243	1079374	226	0.242				22	73	0.41	0.13	24.5			
17-Jul	sun	25	1746895	406	1079823	449	0.793				25	68	1.02	0.33	29.4			
18-Jul	cloud	16	1747239	344	1080154	331	0.457				22	70	0.46	0.15	34.3			
19-Jul	sun	13	1747427	188	1080447	293	0.646	4	2.0	12	12	70			24.5			
20-Jul	sun	13	1747628	201	1080614	167	0.300	3			21	76	0.52	0.17	4.9			
21-Jul	sun	15	1747890	262	1080904	290	0.421	4.7	1.9		26	80	0.43	0.14	31.9			
22-Jul	cloud	21	1748230	340	1081248	344	0.340	3.8	3.2		23	81	0.51	0.17	31.9			
23-Jul	sun	13	1748516	286	1081567	319	0.388	4.6	4.0		19	82	0.70	0.23	39.2			
24-Jul	sun	13	1748797	281	1081892	325	0.281	2.7	1.4		13	83	0.69	0.23	24.5			
25-Jul	cloud	17	1749094	297	1082192	300	0.850	3.8	0.8	8	22	87	0.85	0.28	24.5			
26-Jul	sun	16	1749403	309	1082560	368	0.745	4.4	0.1	10	22	87	1.14	0.37	24.5			
27-Jul	sun	17	1749733	330	1082956	396	0.525	3.2	2.7		28	85			39.2			
28-Jul	sun	17	1750048	315	1083296	340	0.771	3.2	0.6	40	31	69			49.0			
29-Jul	sun	16	1750408	360	1083636	340	4.210	3.6	1.0	12	27	69	1.39	0.45	88.2			
30-Jul	sun	12	1750759	351	1084029	393	1.260	3.6	2.4	8	28	70	0.44	0.14	49.0			
31-Jul	cloud	16	1751214	455	1084419	390	1.050	4.2	0.2		16	99	0.89	0.29	49.0			
Average		18.0		301		324	0.60	3.2	2.5	12	24	71	0.59	0.19	35.7			
Median		17.0		288		325	0.42	3.4	2.0	8	23	70	0.48	0.16	34.3			
Total				9321		10056		56.7	44.7	106					1107.4			

August 2022 WWTP Monthly Report

Date	Weather	Temp. (°C)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	Total PO ₄ (mg/L)	P-OPO ₄ (mg/L)	PAC L/day	Lab Result		
																TSS mg/L	BOD mg/L	Total P mg/L
			1751214															
						1084419												
1-Aug	sun		1751602	388	1084861	442	0.745	5.1			24	98	0.52	0.17	49.0			
2-Aug	sun	18	1751921	319	1085250	389	0.904	2.1			40	95	0.61	0.20	44.1			
3-Aug	sun	17	1752296	375	1085575	325	0.416	3.1	0.4		41	88	0.23	0.08	24.5			
4-Aug	cloud	18	1752685	389	1086018	443	0.769	3.5	0.7	20	31	90	0.49	0.16	44.1			
5-Aug	cloud	8	1753106	421	1086399	381	0.363	2.7	1.9	30	8	90	0.38	0.12	39.2			
6-Aug	cloud	10	1753415	309	1086717	318	0.827	4.5	2.2	30	10	90	0.51	0.17	39.2			
7-Aug	sun	18	1753789	374	1087095	378	0.348	4.1	1.4		1	83	0.52	0.17	34.3			
8-Aug	sun	14	1754004	215	1087334	239	0.480	5.6	2.1	17	19	83	0.45	0.15	39.2			
9-Aug	sun	16	1754305	301	1087702	368	0.245	1.1			34	83	0.40	0.13	29.4			
10-Aug	cloud	14	1754607	302	1087994	292	0.455	4	3.3		42	73	0.47	0.15	34.3			
11-Aug	sun	15	1754981	374	1088396	402	0.296	3.4	2.2	8	41	73	0.79	0.26	24.5			
12-Aug	sun	15	1755298	317	1088750	354	0.552	3.3	9.3	7	40	75	0.78	0.25	34.3			
13-Aug	sun	13	1755650	352	1089094	344	0.254	4	6.9	12	37	78	0.62	0.20	24.5			
14-Aug	sun	17	1756013	363	1089452	358	0.529	5.7	2.2		38	73	1.08	0.35	34.3			
15-Aug	sun	12	1756358	345	1089834	382	0.276	3.9	2.7	7	28	73	0.80	0.26	29.4			
16-Aug	sun	18	1756735	377	1090205	371	0.480	0.9	1.9		17	75	0.77	0.25	29.4			
17-Aug	sun	15	1757077	342	1090595	390	0.325	3.3	3.1		10	71	0.70	0.23	19.6			
18-Aug	sun	16	1757389	312	1090900	305	0.518	3.6	2.9	35	15	73	0.68	0.22	34.3			
19-Aug	sun	17	1757649	260	1091198	298	0.266	2.9	4.2		23	75	0.49	0.16	29.4			
20-Aug	cloud	19	1757925	276	1091519	321	0.531	3.6	4.4	26	33	76	0.77	0.25	29.4			
21-Aug	clear	14	1758204	279	1091808	289	0.304	3.2	3.9	12	39	79	0.60	0.20	29.4			
22-Aug	clear	13	1758484	280	1092133	325	0.623	3.4	4.4	15	46	80	0.94	0.31	39.2			
23-Aug	clear	15	1758764	280	1092450	317	0.361	3.8	1.6		61	75	0.80	0.26	19.6			
24-Aug	clear	18	1759127	363	1092812	362	0.730	3.1	2.9	18	51	75	1.10	0.36	24.5	3.0	2.0	0.317
25-Aug	cloud	17	1759479	352	1093183	371	0.746	4.2	3.1	14	35	76	1.09	0.36	19.6			
26-Aug	cloud	13	1759770	291	1093463	280	0.906	3.3	4.0	20	36	79	0.84	0.27	24.5			
27-Aug	cloud	13	1760068	298	1093943	480	0.570		3.9		37	81	1.30	0.42	39.2			
28-Aug	cloud	5	1760309	241	1094172	229	1.820	4.8	3.3	13	45	83	1.18	0.38	19.6			
29-Aug	sun	7	1760587	278	1094444	272	0.556	3.6			43	86	1.20	0.39	29.4			
30-Aug	sun	8	1760887	300	1094785	341	0.562	1.7	1.0		47	73	1.07	0.35	29.4			
31-Aug	sun	9	1761155	268	1095075	290	0.661	1.6	1.6		42	74	0.73	0.24	29.4			
Average		14.1		321		344	0.56	3.4	3.0	18	33	80	0.74	0.24	31.3			
Median		15.0		312		344	0.53	3.5	2.9	16	37	78	0.73	0.24	29.4			
Total				9941		10656		103.1	81.5	284					970.2			

September 2022 WWTP Monthly Report

Date	Weather	Temp. (°c)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	Total PO ₄ (mg/L)	P-OPO ₄ (mg/L)	PAC L/day	Lab Result		
																TSS mg/L	BOD mg/L	Total P mg/L
			1761155				1095075											
1-Sep	sun	14	1761423	268	1095433	358	0.928	1.5	9.6		45	75	0.87	0.28	19.6			
2-Sep	sun	12	1761703	280	1095709	276	0.325	3.4	3.2		42	79	0.26	0.08	29.4			
3-Sep	smoke	12	1761971	268	1096013	304	0.631		3.1		46	81	0.22	0.07	29.4			
4-Sep	sun	16	1762293	322	1096367	354	0.323				57	82	0.40	0.13	34.3			
5-Sep	sun	15	1762644	351	1096698	331	1.320	0.6			53	94	1.41	0.46	29.4			
6-Sep	sun	10	1763037	393	1097177	479	1.760	1.8			43	74	1.54	0.50	39.2			
7-Sep			1763255	218	1097402	225	1.520	4.3	0.8		46	75	3.95	1.29	24.5			
8-Sep	cloud	12	1763586	331	1097704	302	0.286		4.1		40	75	0.28	0.09	39.2			
9-Sep	cloud	6	1763791	205	1097995	291	0.482		10.3		37	78	0.32	0.10	34.3			
10-Sep	clear	3	1764002	211	1098232	237	0.289		5.4		38	83	0.19	0.06	39.2			
11-Sep	smoke	2	1764260	258	1098521	289	0.392		2.7		37	85	0.16	0.05	44.1			
12-Sep	smoke	10	1764497	237	1098757	236	0.354		5.4		33	88	0.20	0.07	34.3			
13-Sep	smoke	9	1764762	265	1099021	264	0.451				29	88	0.37	0.12	44.1			
14-Sep	smoke	7	1765000	238	1099271	250	0.388				26	79	0.45	0.15	34.3			
15-Sep	fog	8	1765250	250	1099566	295	0.559	1.7	5.8		9	80	0.73	0.24	49.0			
16-Sep	cloud	7	1765433	183	1099775	209	0.314	2.2	6.2		1	83	0.96	0.31	49.0			
17-Sep	cloud	8	1765611	178	1099953	178	0.475	1.7	3.2		2	86	1.01	0.33	44.1			
18-Sep	clear	13	1765831	220	1100222	269	0.234	1	1.4		16	87	0.61	0.20	53.9			
19-Sep	clear	11	1765987	156	1100392	170	0.238	3.7	0.4	115	15	89	0.68	0.22	39.2			
20-Sep	clear	7	1766156	169	1100600	208	0.218		0.6		14	89	0.52	0.17	39.2			
21-Sep	clear	3	1766323	167	1100801	201	0.249				9	89	0.49	0.16	34.3	3.0	2.0	0.132
22-Sep	cloud	7	1766470	147	1100996	195	0.213		2.2		16	84	0.42	0.14	39.2			
23-Sep	cloud	5	1766640	170	1101214	218	0.258		8.5		21	84	0.48	0.16	34.3			
24-Sep	clear	8	1766814	174	1101395	181	0.220		1.9		20	86	0.38	0.12	39.2			
25-Sep	clear	7	1767025	211	1101652	257	0.306				25	88	0.49	0.16	49.0			
26-Sep	clear	11	1767233	208	1101903	251	0.292			120	24	90	0.82	0.27	58.8			
27-Sep	clear	6	1767345	112	1102045	142	0.332				22	84	2.75	0.90	39.2			
28-Sep	clear	9	1767581	236	1102318	273	0.267		0.2		18	90	1.14	0.37	44.1			
29-Sep	rain	13	1767781	200	1102559	241	0.331	1.6	0.3		20	87	0.70	0.23	29.4			
30-Sep	cloud	10	1767987	206	1102771	212	0.260	3.4	3.5		21	87	0.49	0.16	39.2			
Average		9.0		228		257	0.47	2.2	3.8	118	28	84	0.78	0.25	38.5			
Median		9.0		215		251	0.32	1.8	3.2	118	25	85	0.49	0.16	39.2			
Total				6832		7696		26.9	78.8	235					779.1			

October 2022 WWTP Monthly Report

Date	Weather	Temp. (°C)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	Total PO ₄ (mg/L)	P-OPO ₄ (mg/L)	PAC L/day	Lab Result		
																TSS mg/L	BOD mg/L	Total P mg/L
			1767987															
1-Oct	cloud	7	1768205	218	1103044	273	0.358	3.6	3.2		20	86	0.54	0.18	39.2			
2-Oct	clear	7	1768431	226	1103315	271	0.305	3.9	1.2		19	85	0.60	0.20	39.2			
3-Oct	clear	10	1768656	225	1103574	259	0.357	3.2	0.2		10	84	0.75	0.24	44.1			
4-Oct	clear	5	1768808	152	1103747	173	0.310	4.2			7	85	0.64	0.21	39.2			
5-Oct	clear	4	1768951	143	1103918	171	0.364	4.3	1.9		4	84	0.83	0.27	39.2			
6-Oct	clear	5	1769105	154	1104124	206	0.338	3.4	6.3		10	84	0.68	0.22	39.2			
7-Oct	clear	4	1769253	148	1104297	173	0.367	4.3	4.1		10	86	0.77	0.25	39.2			
8-Oct	clear	5	1769410	157	1104503	206	0.314	7.5	3.5		9	84	0.91	0.30	49.0			
9-Oct	clear	4	1769577	167	1104725	222	0.294	3.5	3.2		21	83	0.93	0.30	49.0			
10-Oct	clear	4	1769795	218	1104989	264	0.296	3.9	1.3		25	82	1.07	0.35	44.1			
11-Oct	fog	4	1770026	231	1105256	267	0.397	4.1	2.3		20	78	1.02	0.33	49.0			
12-Oct	clear	5	1770244	218	1105516	260	0.302	4.8	2.9		5	78	1.31	0.43	49.0			
13-Oct	clear	1	1770394	150	1105704	188	0.348	3.5	4.9		3	78	1.17	0.38	34.3			
14-Oct	clear	3	1770560	166	1105909	205	0.263	3.1	3.9		10	79	0.88	0.29	49.0			
15-Oct	clear	1	1770692	132	1106073	164	0.380	3.4	4.3		10	80	0.93	0.30	44.1			
16-Oct	clear	2	1770850	158	1106258	185	0.269	3.7	1.4		10	81	0.80	0.26	44.1			
17-Oct	Clear	0	1770951	101	1106377	119	0.284	4.9		115	11	81	0.79	0.26	44.1			
18-Oct	Clear	1	1771070	119	1106546	169	0.270	4			15	79	0.74	0.24	44.1			
19-Oct	Clear	1	1771193	123	1106677	131	0.324				16	76	1.75	0.57	44.1	3.0	2.0	0.252
20-Oct	Cloud	6	1771320	127	1106866	189	0.389		0.9		16	77	0.59	0.19	49.0			
21-Oct	Cloud	7	1771449	129	1107039	173	0.443	1.2	2.9		13	79	0.82	0.27	49.0			
22-Oct	Rain	4	1771571	122	1107237	198	0.354		2.4		18	81	1.45	0.47	44.1			
23-Oct	Clear	5	1771720	149	1107402	165	0.294				20	83	0.91	0.30	53.9			
24-Oct	Rain	5	1771876	156	1107582	180	0.262	3.7	4.3	120	19	84	0.63	0.21	49.0			
25-Oct	Cloud	4	1772023	147	1107760	178	0.311	7.5	2.8		17	85	0.70	0.23	49.0			
26-Oct	Cloud	4	1772168	145	1107911	151	0.272	4.9	4.1		11	86	0.80	0.26	44.1			
27-Oct	Cloud	5	1772313	145	1108059	148	0.329	1			1	87	0.95	0.31	49.0			
28-Oct	Cloud	3	1772409	96	1108250	191	0.271		3.1		21	88	1.02	0.33	34.3			
29-Oct	Cloud	5	1772523	114	1108420	170	0.341	4.8	12.1		16	89	1.11	0.36	44.1			
30-Oct	Cloud	7	1772665	142	1108588	168	0.256				8	95	0.62	0.20	39.2			
31-Oct	Rain	7	1772822	157	1108800	212	0.307				32	96	0.42	0.14	29.4			
Average		4.4		156		194	0.32	4.0	3.4	118	14	83	0.15	0.29	43.8			
Median		4.0		149		185	0.31	3.9	3.1	118	13	84	0.50	0.27	44.1			
Total				4835		6029		96.4	77.2	235			0.33		989.8			

November 2022 WWTP Monthly Report

Date	Weather	Temp. (°C)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	Total PO ₄ (mg/L)	P-OPO ₄ (mg/L)	PAC L/day	Lab Result		
																TSS mg/L	BOD mg/L	Total P mg/L
			1772822		1108800													
1-Nov	rain	3	1773056	234	1109109	309	0.306	3.5	0.6		80	89	0.77	0.25	49.0			
2-Nov	snow	-1	1773564	508	1109655	546	0.852	7.6	3.3		48	88	1.55	0.51	44.1			
3-Nov	cloud	-4	1773904	340	1110013	358	0.604	2.7			8	90	1.21	0.39	53.9			
4-Nov	snow	-1	1773996	92	1110158	145	0.347	7.8	0.2		20	91	0.19	0.06	19.6			
5-Nov	rain	1	1774177	181	1110412	254	0.290		4.8		50	93	0.57	0.19	29.4			
6-Nov	snow	-4	1774568	391	1110851	439	0.707				44	90	1.59	0.52	73.5			
7-Nov	snow	-14	1774843	275	1111181	330	0.402	3.3		120	35	85	1.13	0.37	49.0			
8-Nov	cloud	-13	1775057	214	1111455	274	0.662		1.5		25	84	1.54	0.50	44.1			
9-Nov	clear	-15	1775273	216	1111726	271	0.472		1.3		12	86	2.01	0.66	44.1			
10-Nov	cloud	-13	1775459	186	1111934	208	0.549		2.3		10	87	0.54	0.18	39.2			
11-Nov	cloud	-7	1775606	147	1112127	193	0.320	3.4			10	89	0.23	0.08	44.1			
12-Nov	cloud	-10	1775767	161	1112339	212	0.484	4.2	2.5		10	88	0.34	0.11	44.1			
13-Nov	cloud	-8	1775932	165	1112530	191	0.338	6.2	1.2		10	88	0.84	0.27	39.2			
14-Nov	cloud	-9	1776079	147	1112734	204	0.360	6.8	0.9		10	88	0.50	0.16	44.1			
15-Nov	cloud	-7	1776216	137	1112929	195	0.373	6.1	1.3		10	86	0.48	0.16	39.2			
16-Nov	cloud	-8	1776349	133	1113104	175	0.448	5.6	4.1		6	81	0.50	0.16	49.0			
17-Nov	clear	-15	1776483	134	1113257	153	0.365	2.3	2.8		10	82	0.70	0.23	44.1			
18-Nov	clear	-18	1776599	116	1113465	208	0.766	4.1	1.0		15	81	1.45	0.47	39.2			
19-Nov	clear	-23	1776725	126	1113612	147	0.547	1.8	5.9		16	82	1.24	0.40	44.1			
20-Nov	clear	-13	1776857	132	1113784	172	0.423				17	85	0.52	0.17	44.1			
21-Nov	clear	-8	1776983	126	1113954	170	0.362	8.0	9.3	120	19	86	0.43	0.14	9.8			
22-Nov	clear	-7	1777158	175	1114173	219	0.552	8.3	8.8		9	88	0.62	0.20	39.2			
23-Nov	clear	-1	1777349	191	1114406	233	0.378	5.8	3.2		10	84	0.71	0.23	44.1	3.0	2.0	0.146
24-Nov	cloud	-4	1777451	102	1114557	151	0.544	4.4	5.3		10	55	0.33	0.11	34.3			
25-Nov	cloud	-2	1777555	104	1114699	142	0.324	4.5	3.8	120	20	90	0.33	0.11	44.1			
26-Nov	cloud	-3	1777712	157	1114610	-89	0.421	3.7	2.8		19	90	0.75	0.24	39.2			
27-Nov	snow	-2	1777895	183	1115130	520	0.355	3.9	2.9		21	91	0.71	0.23	44.1			
28-Nov	cloud	-14	1778054	159	1115294	164	0.612	7.1	0.5		16	92	1.44	0.47	34.3			
29-Nov	cloud	-20	1778224	170	1115513	219	0.586	4.3	0.3		14	89	2.19	0.71	44.1			
30-Nov	snow	-13	1778401	177	1115741	0	0.679				12	96	1.77	0.58	73.5			
Average	N/A	-8.4		186		224	0.48	5.0	2.9	120	20	86	0.91	0.30	42.8			
Median	N/A	-8.0		163		206	0.44	4.4	2.7	120	15	88	0.71	0.23	44.1			
Total	N/A	N/A		5579		6713	N/A	115.4	70.6	360	N/A	N/A	N/A	N/A	534.1			

December 2022 WWTP Monthly Report

Date	Weather	Temp. (°c)	Total Influent Flow (m ³)	Daily Influent flow (m ³)	Total Effluent Flow	Effluent Flow (m ³)	TSS (mg/L)	Solids Bagged (m ³)	Wasting (m ³)	Bags Rem'd	EQ Tank % Full	SD Tank % Full	P-OPO4 (mg/L)	PAC L/day	Lab Result		
															TSS mg/L	BOD mg/L	Total P mg/L
			1778401	1115741													
1-Dec	cloud	-14	1778551	150	1115947	206	0.474		3.7		19	92	0.55	44.1			
2-Dec	cloud	-18	1778725	174	1116129	182	0.335		3.7		20	86	0.08	29.4			
3-Dec	cloud	-8	1778916	191	1116360	231	0.373		2.1		22	89	0.06	34.3			
4-Dec	cloud	-10	1779141	225	1116604	244	0.836				29	91	0.05	44.1			
5-Dec	cloud	-9	1779440	299	1116914	310	0.547				13	93	0.46	29.4			
6-Dec	cloud	-11	1779663	223	1117176	262	1.470				10	95	0.35	49.0			
7-Dec	cloud	-3	1779838	175	1117381	205	0.791				10	96	0.31	49.0			
8-Dec	cloud	-6	1779999	161	1117612	231	0.431	2.9			10	98	0.48	44.1			
9-Dec	cloud	-6	1780175	176	1117834	222	2.380	5.8	2.7		10	96	0.58	49.0			
10-Dec	snow	-7	1780366	191	1118064	230	0.336	5.3	1.3		6	97	0.46	39.2			
11-Dec	cloud	-5	1780608	242	1118358	294	2.750	5.8		120	24	98	0.42	44.1			
12-Dec	clear	-6	1780834	226	1118636	278	4.200	4.4			26	96	0.40	44.1			
13-Dec	clear	-9	1781049	215	1118878	242	0.566	8.7	1.1		19	97	0.82	44.1			
14-Dec	snow	-7	1781275	226	1119156	278	0.356	6.8	3.5		10	95	0.56	39.2	3.0	10.8	0.595
15-Dec	cloud	-11	1781448	173	1119388	232	0.583	8.0	3.9		13	95	0.63	44.1			
16-Dec	snow	-11	1781648	200	1119618	230	0.270	7.6	4.3		7	94	0.26	44.1			
17-Dec	snow	-10	1781854	206	1119872	254	0.448	15.0	2.0		5	94	0.20	44.1			
18-Dec	snow	-19	1782100	246	1120156	284	0.272	8.6	1.1		16	98	0.43	39.2			
19-Dec	clear	-24	1782368	268	1120508	352	0.394	7.2	3.4		10	96	0.40	44.1			
20-Dec	clear	-23	1782506	138	1120710	202	0.261	5.3	3.2		21	97	0.26	29.4			
21-Dec	clear	-23	1782739	233	1121008	298	0.388	5.5	3.3		19	97	0.38	34.3			
22-Dec	clear	-31	1782946	207	1121276	268	0.264	9.9	4.6		21	97	0.20	34.3			
23-Dec	snow	-23	1783165	219	1121558	282	0.362	5.1	3.3		0	96	0.42	34.3			
24-Dec	cloud	-14	1783437	272	1121902	344	0.261	5.6	1.4		2	97	0.34	44.1			
25-Dec	clear	-3	1783694	257	1122202	300	0.346	6.3	4.2		19	100	0.36	34.3			
26-Dec	rain	2	1784004	310	1122612	410	0.301	6.5	4.3		21	99	0.60	49.0			
27-Dec	rain	2	1784355	351	1123115	503	0.579	6.5	5.4		51	100	0.49	58.8			
28-Dec	rain/snow	0	1784413	58	1123749	634	0.431	7.7	10.0		69	100	0.61	49.0			
29-Dec	cloud	0	1785544	1131	1124508	759	0.628	5.1	3.1	120	56	90	0.54	39.2			
30-Dec	cloud	-5	1786199	655	1125265	757	0.827	6.5	4.9		31	93	0.70	53.9			
31-Dec	cloud	-4	1786815	616	1125967	702	2.500	7.2	2.5		7	62	0.67	73.5			
Average		-10.2		271		330	0.81	6.8	3.5	120	19	94	0.42	43.0			
Median		-9.0		223		278	0.43	6.5	3.4	120	19	96	0.42	44.1			
Total				8414		10226		163.3	83.0	240				1332.8			

2022 Fernie Alpine Resort Wastewater Treatment Plant Summary

	Temperature		Influent flow			Effluent Flow			TSS		Volume Bagged			Volume Wasted			Amount of Bags Removed			EQ Tank % Full		SD Tank % Full		Total PO4 (mg/L)		Alum/ PAC usage (L)		
	Average	Median	Average	Median	Total	Average	Median	Total	Average	Median	Average	Median	Total	Average	Median	Total	Average	Median	Total	Average	Median	Average	Median	Average	Median	Total		
January	-5.4	-4.0	350	350	10842	399	400	12356	0.4	0.3	8.5	8.5	262.9	6.7	6.0	193.7	17.7	16.0	550	27	31	67	67	0.69	0.59	48.0	49.8	1516
February	-5.6	-2.5	352	349	9847	402	404	11254	0.4	0.3	7.8	7.7	217.9	2.6	2.1	72.0	15.6	15.0	422	28	37	56	56	0.65	0.66	49.7	47.7	1656
March	-0.5	1.0	439	431	13603	500	461	15504	0.3	0.3	6.1	6.3	190.4	1.8	1.6	56.6	12.1	12.0	376	32	38	55	54	0.74	0.67	43.4	50.2	1248
Q1	-3.8	-2.5	380	350	34292	434	404	39114	0.3	0.3	7.5	7.7	671.2	3.7	2.1	322.3	15.2	15.0	1348	29	37	59	56	0.69	0.66	47.0	49.8	4420
April	1.3	1.0	263	242	7884	263	290	9147	0.3	0.8	2.8	2.3	82.5	1.2	0.9	35.9	12.4	12.0	173	31	29	49	48	0.52	0.56	28.6	50.2	657
May	7.6	8.0	199	204	6183	231	232	7155	0.3	1.4	2.4	2.3	33.4	2.4	2.3	35.7	8.0	8.0	96	21	21	53	52	0.68	0.62	27.2	24.5	478
June	12.4	12.0	233	208	6999	264	228	7909	0.4	0.9	1.9	1.7	19.3	3.3	2.6	33.4	8.0	8.0	48	22	21	64	20	0.82	0.58	24.7	24.5	456
Q2	7.1	8.0	232	208	21066	252	232	24211	0.3	0.9	2.4	2.3	135.2	2.3	2.3	105.0	9.5	8.0	317	25	21	55	48	0.68	0.58	26.8	24.5	1590
July	18.0	17.0	301	288	9321	324	288	10056	0.6	0.4	3.2	3.4	56.7	2.5	2.0	44.7	11.8	8.0	106	24	23	71	70	0.59	0.48	35.7	34.3	1107
August	14.1	15.0	321	312	9941	344	344	10656	0.6	0.5	3.4	3.5	103.1	3.0	2.9	81.5	17.8	16.0	284	33	37	80	78	0.74	0.73	31.3	29.4	970
September	9.0	9.0	228	215	6832	257	251	7696	0.5	0.3	2.2	1.8	26.9	3.8	3.2	78.8	117.5	117.5	235	28	25	84	85	0.78	0.49	38.5	39.2	779
Q3	13.7	15.0	283	288	26094	308	288	28408	0.5	0.4	2.9	3.4	186.7	3.1	2.9	205.0	49.0	16.0	625	28	25	78	78	0.70	0.49	35.2	34.3	2857
October	4.4	4.0	156	149	4835	194	185	6029	0.3	0.3	4.0	3.9	96.4	3.4	3.1	77.2	117.5	117.5	235	14	13	83	84	0.15	0.50	43.8	9.0	277
November	-8.4	-8.0	186	163	6713	224	206	6713	0.5	0.4	5.0	4.4	115.4	2.9	2.7	70.6	120.0	120.0	360	20	15	86	88	0.91	0.71	42.8	9.0	262
December	-10.2	-9.0	271	223	8414	330	278	10226	0.8	0.4	6.8	6.5	163.3	3.5	3.4	83.0	120.0	120.0	240	19	19	94	96	1.29	1.30	43.0	9.0	272
Q4	-4.8	-8.0	204	163	19962	249	206	22968	0.5	0.4	5.3	4.4	375.1	3.3	3.1	230.8	119.2	120.0	835	18	15	88	88	0.78	0.71	43.2	9.0	811
Annual	3.0	2.5	275	232	101414	311	283	114701	0.4	0.4	4.5	3.7	1368.2	3.1	2.6	863.1	48.2	15.5	3125	25	24	70	69	0.7	0.6	38.1	31.9	9678



Date: September 30, 2002

Our File: RB 17139

REGISTERED MAIL

Resorts of the Canadian Rockies Inc.
PO Box 997
Victoria, BC V8W 2S8

Resorts of the Canadian Rockies Inc.
1507 - 17th Avenue, SW
Calgary Alberta T2T 0E2

Dear Sir:

Re: Registration under the *Municipal Sewage Regulation* of the discharge to the Elk River from the Fernie Alpine Resort sewage treatment plant located at District Lot 8900, Kootenay District (Plan 1687) near Fernie British Columbia

This is to acknowledge your registration form under the *Municipal Sewage Regulation* (the *Regulation*) dated August 30, 2001, and received at this office on October 31, 2001, for the registration of the wastewater treatment plant owned and operated by Resorts of the Canadian Rockies Inc. at the Fernie Alpine Resort ski hill located near Fernie, British Columbia. Pursuant to Part 2, section 3 of the *Regulation*, the effective date of registration of this discharge is the date of this letter. The ministry file number for this discharge is RB 17139. Please indicate this number on all future correspondence regarding this discharge.

The initial registration fee is \$148.55. Please submit to the Regional Manager (the *Manager*) a cheque payable to the Minister of Finance and Corporate Relations, for this amount by September 25, 2002. An annual registration fee will be determined according to the *Waste Management Permit Fees Regulation* and you will be receiving an annual invoice from the ministry for payment of this fee. Payment of all fees due is necessary to comply with the *Regulation*. Fees will be calculated using a maximum effluent flow of 1280 m³/day, a maximum BOD₅ of 45 mg/L and a maximum TSS of 45 mg/L.

We wish to remind you that the discharger is responsible for compliance with the requirements of the *Regulation*, the registration, the *Waste Management Act* (the *Act*) and this registration letter. Your attention is respectfully directed to the terms and conditions outlined in the *Regulation*, the registration, this registration letter and the *Act*. Compliance with all the terms and conditions of the *Regulation*, the registration and this registration letter is required. Contravention of any of the conditions of the *Regulation*, the registration and this letter is a violation of the *Act* and may result in prosecution.

Ministry of
Water, Land and Air
Protection

Kootenay Region

Mailing/Location Address:
401 - 583 Victoria Street
Nelson BC V1L 6X2

Telephone: 250 954-3338
Facsimile: 250 954-6332
PP Facsimile: 250 354-9357

We also wish to draw your attention to the Environmental Impact Study Guideline dated December 2000 or the latest version and the Regulation Compliance Guideline dated January 2001 or the latest version, these policy documents are used in conjunction with the Regulation, the registration and the Act.

The Regulation and policy documents are available at :

<http://wlapwww.gov.bc.ca/opd/opdpu/mpp/machome.html>

This letter does not replace the Act, regulations issued under the Act or the Regulation. It does not list all provisions relating to municipal sewage discharges. If there are differences or omissions in this document then the Act, the regulations issued under the Act and the Regulation apply except where expressly noted in this letter.

Registration under the Regulation should not be construed as a representation that the authorized works are adequately designed or will satisfy the Regulation. It is the responsibility of the discharger to ensure that the works are adequately designed, constructed and operated and that the discharge quality complies with the Regulation and this letter. Registration under the Regulation and this letter are without prejudice to any additional works that may be required or any additional requirements that may be specified by the Manager. The Manager may also issue Orders under the Act.

Registration under the Regulation does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority shall rest with the discharger. It is also the responsibility of the discharger to ensure that all activities conducted under this registration are carried out with regard to the rights of third parties and comply with other applicable legislation that may be in force. The discharger must also obtain any necessary approvals from other agencies.

Administration of the Act, the Regulation, the registration and this registration letter will be carried out by staff from our Sub-Regional Office located at #205 Industrial Road G, Cranbrook, British Columbia, V1C 7G5, (telephone: (250) 489-8570) or from our Regional Office located at #401 - 333 Victoria Street, Nelson, British Columbia, V1L 4K3. Plans, data and reports pertinent to the Regulation, registration and this letter are to be submitted to the Manager at the Sub-Regional office address at Cranbrook, British Columbia in the form required by the Regulation or in the form required by the Manager. The ministry uses a reference number to track monitoring data associated with discharges. The site reference number for this discharge is B102571.

Registration Reference Documents

This registration under the *Regulation* is based on the following documents:

1. The Fernie Alpine Resort Limited, Registration Form dated August 30, 2001 and received October 31, 2001.
2. Environmental Impact Study, Sewage Treatment Plant at Fernie Alpine Resort, prepared for Fernie Alpine Resort Ltd. by Highwood Environmental Management Limited dated April 2001.
3. Environmental Impact Study for Fernie Alpine Resort's Wastewater Discharge into the Elk River, Interim Report prepared by Concor Pacific Environmental Technologies Incorporated dated May 1, 2001.
4. Fernie Alpine Resort, Wastewater Treatment Plant, Guiding Document for Proposed Improvements 2001 prepared by Urban Systems dated May 2001.
5. Urban Systems drawings titled Fernie Alpine Resort Wastewater Treatment Plant Expansion dated August, 2001.

Treatment Plant Works

The treatment plant works are one influent macerator and screen, two aeration flow equalization tanks, a separate equalization tank, two clarifiers, two three stage rotating biological contactors, two flocculation tanks with mixers and coagulant feed, two sand filters, a backwash water settling tank, UV disinfection units, one aerated biosolids (sludge) digestion tank, biosolids (sludge) dewatering equipment and a pipeline and outfall to the Elk River and related appurtenances approximately as shown on Urban Systems drawings titled Fernie Alpine Resort Wastewater Treatment Plant Expansion dated August, 2001 or on the attached Site Plan. The plant maximum daily flow and discharge to the environment is 1280 m³/day. The effluent quality shall be BOD₅ of 35 mg/L, TSS of 45 mg/L, total phosphorus of 1.0 mg/L, ortho phosphates 0.5 mg/L and the effluent shall also pass a 96 hour LC50 bioassay test.

Primary Screenings and Dewatered Biosolids (Sludge) Disposal

Primary screenings and dewatered biosolids (sludge) from the treatment plant shall be disposed at the Crownest/Pincher Creek Landfill. The discharger shall submit confirmation of acceptance of the screenings and biosolids by the Crownest/Pincher Creek Landfill Authority on or before October 25, 2002. If primary screenings and dewatered biosolids (sludge) from the treatment plant are not disposed at the Crownest/Pincher Creek Landfill they must be disposed in accordance with an authorization issued under the Act, the Organic Matter Recycling Regulation or in a manner approved by the Manager.

Semi-solid Waste

The discharger shall not accept semi-solid wastes at the treatment plant. Semi-solid wastes means septic tank pumpage, holding tank solids or sludge from sewage facilities.

Plant Design

The treatment plant design must be in accordance with Schedule 7 of the *Regulation* and meet reliability Category I. The discharger shall provide written confirmation that the treatment plant works meet reliability Category I and confirm that multiple disinfection units have been installed. The confirmation shall be submitted on or before October 25, 2002.

Outfall Diffuser

The discharger shall install an outfall diffuser in accordance with Part 4, Section 3 and Schedule 7, Condition 4 of the *Regulation*. The diffuser shall be installed on or before August 31, 2003. The discharger must obtain all necessary approvals from other agencies prior to installing the diffuser.

Additional Works

The works are to be designed to allow for additional facilities in future to reduce effluent ammonia levels if ammonia levels in the Elk River exceed the current British Columbia Approved Water Quality Guidelines (Criteria) or if monitoring results indicate exceedance of the current Criteria for ammonia is imminent. Water quality Criteria apply at the edge of the initial dilution zone.

The works are also to be designed to allow for increased phosphorus removal if algae problems develop in the Elk River.

check the flow

Operator Qualifications and Certification

The discharger shall ensure that the treatment plant is classified and the treatment plant operators certified in accordance with Part 6, Section 22 of the *Regulation*. Proof of treatment plant classification (copy of classification) and operator certification (copy of certification) shall be submitted to the *Manager* on or before October 25, 2002.

Monitoring

The discharger shall undertake monitoring in accordance with Part 7 and applicable conditions of Schedule 5 of the *Regulation* subject to the requirements as follows:

Sampling and Analysis

Sampling and analysis shall be in accordance with Part 7, Section 25 of the *Regulation*.
 Minimum detection limits for nutrients shall be:

Ammonia	5µg/L	(1/100)
Nitrate	5 µg/L	
Nitrite	2 µg/L	
Total Phosphorus	3 µg/L	
Orthophosphate	3 µg/L	

These detection limits shall only apply to the analysis of samples obtained from the Elk River. These detection limits will not apply to the analysis of samples obtained from the plant influent and effluent.

Please note the requirement to submit data in accordance with the *Environmental Data Quality Assurance Regulation* as per Section 25 (3) of the *Regulation*.

Discharge Monitoring and Receiving Environment Monitoring

In accordance with Part 7, Section 26 and 27 of the *Regulation* the discharger shall undertake the following monitoring program:

Sampling Location Frequency/Type

	Elk River ¹ (At Sites UP, IDZ and DN)	Plant Influent ²	Plant Effluent ²
Parameter			
pH (field test)	WS/G		M/G and WS/G
temperature (field test)	WS/G		
flow		D/CON.	D/CON.
BOD ₅ ¹		M/G	M/G and WS/G
TSS ²	WS/G	M/G	M/G and WS/G and D/CON.
ammonia (as nitrogen)	WS/G		M/G and WS/G
nitrate (as nitrogen)	WS/G		M/G and WS/G
nitrite (as nitrogen)	WS/G		M/G and WS/G
total phosphorus	WS/G		M/G and WS/G
	Elk River ¹ (At Sites UP, IDZ and DN)	Plant Influent ²	Plant Effluent ²
orthophosphate	WS/G		M/G and WS/G
fecal coliforms	WS/G		M/G and WS/G
Toxicity			3Y/G

1. BOD₅ - means the total 5-day biochemical oxygen demand.
2. TSS - means total suspended solids or non-filterable residue.
3. Plant influent and effluent samples must be obtained at peak times on peak flow days. The peak flow days shall be based on bookings at the resort. An influent flow meter shall be installed on or before December 31, 2003.
4. Sampling of the Elk River shall be done on the same day as plant influent and effluent sampling and also correspond with peak flow days at the resort in a manner similar to plant influent/effluent sampling.

Sampling Location/Frequency/Type

	Elk River ¹ (At Sites UP, IDZ and DN)	Plant Influent ²	Plant Effluent ²
Parameter			
pH (field test)	WS/G		M/G and WS/G
temperature (field test)	WS/G		
flow		D/CON.	D/CON.
BOD ₅ ¹		M/G	M/G and WS/G
TSS ²	WS/G	M/G	M/G and WS/G and D/CON.
ammonia (as nitrogen)	WS/G		M/G and WS/G
nitrate (as nitrogen)	WS/G		M/G and WS/G
nitrite (as nitrogen)	WS/G		M/G and WS/G
total phosphorus	WS/G		M/G and WS/G
	Elk River ¹ (At Sites UP, IDZ and DN)	Plant Influent ²	Plant Effluent ²
orthophosphate	WS/G		M/G and WS/G
fecal coliforms	WS/G		M/G and WS/G
Toxicity			3Y/G

1. BOD₅ - means the total 5-day biochemical oxygen demand.
2. TSS - means total suspended solids or non-filterable residue.
3. Plant influent and effluent samples must be obtained at peak times on peak flow days. The peak flow days shall be based on bookings at the resort. An influent flow meter shall be installed on or before December 31, 2003.
4. Sampling of the Elk River shall be done on the same day as plant influent and effluent sampling and also correspond with peak flow days at the resort in a manner similar to plant influent/effluent sampling.

Sampling Frequency:

D - means daily.

M - means monthly.

WS - weekly seasonal (This means obtaining samples weekly for a six week period in the spring, in the fall and during the Christmas season at peak flow times and days. Peak flow days will be predicted on the basis of resort bookings. The commencement of the spring and fall sampling seasons depends on weather and hydrologic conditions. The spring sampling should begin early in the spring after ice-out when river flows are low and the fall sampling should begin when river flows are low and turbidity is low. Professional judgment should be used regarding the start times of the weekly sampling programs in the spring and fall. The Christmas sampling should begin in mid-December and extend into January. During the six week sampling period the monthly sampling is not necessary.)

3Y - means three times per year to correspond with the WS sampling.

Sample Type:

G - means grab sample (Note: when obtaining samples of the influent and effluent the grab samples will be taken on peak flow days at peak flow times during the day. Peak days shall be predicted on the basis of bookings at the resort.)

CON. - means continuous using a data logger. (Note: Flow meters and TSS monitors shall be calibrated. The flow meter and TSS meter calibration frequency and procedures shall be contained in the operating plan.)

Monitoring for Plant Operation Purposes

The discharger is expected to undertake additional monitoring for plant operation purposes. The monitoring program outlined in this letter is not considered adequate for plant operation purposes.

Environmental Monitoring System (EMS) Numbers

The following are the EMS site numbers assigned to the monitoring sites listed above. These numbers are to be used when entering data directly into the Ministry EMS database in accordance with Part 7, Section 28 (2) of the Regulation. Monitoring data shall be submitted to the Ministry data base quarterly within 30 days of the end of each quarter.

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Monitoring Program Changes

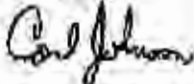
The Manager may modify the monitoring program from time to time. The annual report shall contain recommendations regarding changes (additions/deletions/modifications) to the monitoring program.

Supervisory Control and Data Acquisition (SCADA)

The discharger is encouraged to install a SCADA system. SCADA systems may be a requirement in the future.

If you have any questions concerning this registration, please contact our Cranbrook Sub-Regional Office at (250) 489-8540.

Yours truly,



Carl Johnson, P.Eng.
Assistant Regional Waste Manager

/s/

- cc: Paul Bates, Resorts of the Canadian Rockies, Calgary
- Toby Todaro, Resorts of the Canadian Rockies, Calgary
- Genar Gigliotti, P.Eng. Urban Systems, Kelowna
- Andrew Walls, Fernie Alpine Resort, Fernie
- Andrew Brown, Fernie Alpine Resort, Fernie
- Ken van Heyningen, Fernie Alpine Resort, Fernie
- Gary Lawrence, MWLAP, Cranbrook



CERTIFICATE OF ANALYSIS

Work Order	: CG2107254	Page	: 1 of 4
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC WINTER EMS WEEK 3	Date Samples Received	: 30-Dec-2021 08:50
PO	: ----	Date Analysis	: 30-Dec-2021
		Commenced	
C-O-C number	: ----	Issue Date	: 07-Jan-2022 13:28
Sampler	: Kevin Mackey		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 5		
No. of samples analysed	: 4		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Erin Sanchez		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Microbiology, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

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

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

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

Workorder Comments

We did not received sample (fraction5) as client didn't send, unsafety reason

Qualifiers

<i>Qualifier</i>	<i>Description</i>
BODP	BOD dilution results differed by more than 30% RPD. Precision of reported BOD result may be less than usual.
BODQ	BOD Qualification: Lab Control Sample outside standard 85-115% objective (see QC report). Sample(s) cannot be rerun due to hold time expiry.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

CG2107254-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP INFLUENT\

Client sampling date / time: 29-Dec-2021 09:45

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.28	0.10	pH units	E108	30-Dec-2021	30-Dec-2021	378696
solids, total suspended [TSS]	----	259	3.0	mg/L	E160-H	-	02-Jan-2022	378397
Aggregate Organics								
biochemical oxygen demand [BOD]	----	219 ^{BODP,} _{BOD5,}	75.0	mg/L	E550	-	30-Dec-2021	378779

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

Analytical Results

CG2107254-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP EFFLUENT

Client sampling date / time: 29-Dec-2021 10:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.05	0.10	pH units	E108	30-Dec-2021	30-Dec-2021	378696
solids, total suspended [TSS]	----	3.1	3.0	mg/L	E160-H	-	02-Jan-2022	378397
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.913	0.0250	mg/L	E298	30-Dec-2021	30-Dec-2021	378433
nitrate (as N)	14797-55-8	34.2	0.0250	mg/L	E235.NO3-L	30-Dec-2021	30-Dec-2021	378574
nitrite (as N)	14797-65-0	0.419	0.0050	mg/L	E235.NO2-L	30-Dec-2021	30-Dec-2021	378573
phosphate, ortho-, dissolved (as P)	14265-44-2	0.305	0.0100	mg/L	E378-U	30-Dec-2021	30-Dec-2021	378454
phosphorus, total	7723-14-0	0.310 ^{DLHC,}	0.0100	mg/L	E372-U	31-Dec-2021	31-Dec-2021	378657
nitrate + nitrite (as N)	----	34.6	0.0255	mg/L	EC235.N+N	-	03-Jan-2022	-
Bacteriological Tests								
coliforms, thermotolerant [fecal]	----	25	1	CFU/100mL	E012.FC	-	31-Dec-2021	379452
Aggregate Organics								
biochemical oxygen demand [BOD]	----	<2.0	2.0	mg/L	E550	-	30-Dec-2021	378779
chemical oxygen demand [COD]	----	26	10	mg/L	E559-L	-	04-Jan-2022	380352

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

Analytical Results

CG2107254-003

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: ELK RIVER UPSTREAM

Client sampling date / time: 29-Dec-2021 10:30

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.40	0.10	pH units	E108	30-Dec-2021	30-Dec-2021	378696
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160-H	-	02-Jan-2022	378397
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0216	0.0050	mg/L	E298	30-Dec-2021	30-Dec-2021	378433
nitrate (as N)	14797-55-8	1.69	0.0050	mg/L	E235.NO3-L	30-Dec-2021	30-Dec-2021	378574
nitrite (as N)	14797-65-0	0.0031	0.0010	mg/L	E235.NO2-L	30-Dec-2021	30-Dec-2021	378573
phosphate, ortho-, dissolved (as P)	14265-44-2	0.0022	0.0010	mg/L	E378-U	30-Dec-2021	30-Dec-2021	378454
phosphorus, total	7723-14-0	0.0060	0.0020	mg/L	E372-U	31-Dec-2021	31-Dec-2021	378657



Analytical Results

CG2107254-003

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID: ELK RIVER UPSTREAM

Client sampling date / time: 29-Dec-2021 10:30

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients								
nitrate + nitrite (as N)	----	1.69	0.0051	mg/L	EC235.N+N	-	03-Jan-2022	-
Bacteriological Tests								
coliforms, thermotolerant [fecal]	----	1	1	CFU/100mL	E012.FC	-	31-Dec-2021	379452

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

Analytical Results

CG2107254-004

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID: ELK RIVER OUTFALL

Client sampling date / time: 29-Dec-2021 10:15

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.23	0.10	pH units	E108	30-Dec-2021	30-Dec-2021	378696
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160-H	-	02-Jan-2022	378397
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0433	0.0050	mg/L	E298	30-Dec-2021	30-Dec-2021	378433
nitrate (as N)	14797-55-8	15.5	0.0050	mg/L	E235.NO3-L	30-Dec-2021	30-Dec-2021	378574
nitrite (as N)	14797-65-0	0.0685	0.0010	mg/L	E235.NO2-L	30-Dec-2021	30-Dec-2021	378573
phosphate, ortho-, dissolved (as P)	14265-44-2	0.0791	0.0010	mg/L	E378-U	30-Dec-2021	30-Dec-2021	378454
phosphorus, total	7723-14-0	0.0707	0.0020	mg/L	E372-U	31-Dec-2021	31-Dec-2021	378657
nitrate + nitrite (as N)	----	15.6	0.0051	mg/L	EC235.N+N	-	03-Jan-2022	-
Bacteriological Tests								
coliforms, thermotolerant [fecal]	----	3	1	CFU/100mL	E012.FC	-	31-Dec-2021	379452

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2107254	Page	: 1 of 9
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC WINTER EMS WEEK 3	Date Samples Received	: 30-Dec-2021 08:50
PO	: ----	Issue Date	: 07-Jan-2022 13:28
C-O-C number	: ----		
Sampler	: Kevin Mackey		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 5		
No. of samples analysed	: 4		

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

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Aggregate Organics	QC-378779-002	----	biochemical oxygen demand [BOD]	----	E550	73.3 % LCS-ND	85.0-115%	Recovery less than lower control limit

Result Qualifiers

Qualifier	Description
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	29-Dec-2021	----	----	----		30-Dec-2021	3 days	1 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP INFLUENT\	E550	29-Dec-2021	----	----	----		30-Dec-2021	3 days	1 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E559-L	29-Dec-2021	----	----	----		04-Jan-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER OUTFALL	E298	29-Dec-2021	30-Dec-2021	----	----		30-Dec-2021	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E298	29-Dec-2021	30-Dec-2021	----	----		30-Dec-2021	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	29-Dec-2021	30-Dec-2021	----	----		30-Dec-2021	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)										
HDPE ELK RIVER OUTFALL	E378-U	29-Dec-2021	----	----	----		30-Dec-2021	3 days	1 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)										
HDPE ELK RIVER UPSTREAM	E378-U	29-Dec-2021	----	----	----		30-Dec-2021	3 days	1 days	✔
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)										
HDPE WWTP EFFLUENT	E378-U	29-Dec-2021	----	----	----		30-Dec-2021	3 days	1 days	✔
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE ELK RIVER OUTFALL	E235.NO3-L	29-Dec-2021	----	----	----		30-Dec-2021	3 days	1 days	✔
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE ELK RIVER UPSTREAM	E235.NO3-L	29-Dec-2021	----	----	----		30-Dec-2021	3 days	1 days	✔
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE WWTP EFFLUENT	E235.NO3-L	29-Dec-2021	----	----	----		30-Dec-2021	3 days	1 days	✔
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE ELK RIVER OUTFALL	E235.NO2-L	29-Dec-2021	----	----	----		30-Dec-2021	3 days	1 days	✔
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE ELK RIVER UPSTREAM	E235.NO2-L	29-Dec-2021	----	----	----		30-Dec-2021	3 days	1 days	✔
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE WWTP EFFLUENT	E235.NO2-L	29-Dec-2021	----	----	----		30-Dec-2021	3 days	1 days	✔
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)										
Amber glass total (sulfuric acid) ELK RIVER OUTFALL	E372-U	29-Dec-2021	31-Dec-2021	----	----		31-Dec-2021	28 days	2 days	✔



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E372-U	29-Dec-2021	31-Dec-2021	----	----		31-Dec-2021	28 days	2 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	29-Dec-2021	31-Dec-2021	----	----		31-Dec-2021	28 days	2 days	✓	
Bacteriological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER OUTFALL	E012.FC	29-Dec-2021	----	----	----		31-Dec-2021	30 hrs	49 hrs	* EHTL	
Bacteriological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER UPSTREAM	E012.FC	29-Dec-2021	----	----	----		31-Dec-2021	30 hrs	49 hrs	* EHTL	
Bacteriological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	29-Dec-2021	----	----	----		31-Dec-2021	30 hrs	49 hrs	* EHTL	
Physical Tests : pH by Meter											
HDPE ELK RIVER OUTFALL	E108	29-Dec-2021	----	----	----		30-Dec-2021	0.25 hrs	27 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER UPSTREAM	E108	29-Dec-2021	----	----	----		30-Dec-2021	0.25 hrs	27 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP EFFLUENT	E108	29-Dec-2021	----	----	----		30-Dec-2021	0.25 hrs	27 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP INFLUENT\	E108	29-Dec-2021	----	----	----		30-Dec-2021	0.25 hrs	27 hrs	* EHTR-FM	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER OUTFALL	E160-H	29-Dec-2021	----	----	----		02-Jan-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER UPSTREAM	E160-H	29-Dec-2021	----	----	----		02-Jan-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160-H	29-Dec-2021	----	----	----		02-Jan-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160-H	29-Dec-2021	----	----	----		02-Jan-2022	7 days	4 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 EHTR: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	378433	1	14	7.1	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	378779	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	380352	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	378454	1	11	9.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	378574	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	378573	1	20	5.0	5.0	✔
pH by Meter	E108	378696	1	20	5.0	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	379452	1	19	5.2	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	378657	1	12	8.3	5.0	✔
TSS by Gravimetry	E160-H	378397	1	12	8.3	5.0	✔
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	378433	1	14	7.1	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	378779	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	380352	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	378454	1	11	9.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	378574	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	378573	1	20	5.0	5.0	✔
pH by Meter	E108	378696	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	378657	1	12	8.3	5.0	✔
TSS by Gravimetry	E160-H	378397	1	12	8.3	5.0	✔
Method Blanks (MB)							
Ammonia by Fluorescence	E298	378433	1	14	7.1	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	378779	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	380352	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	378454	1	11	9.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	378574	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	378573	1	20	5.0	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	379452	1	19	5.2	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	378657	1	12	8.3	5.0	✔
TSS by Gravimetry	E160-H	378397	1	12	8.3	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	378433	1	14	7.1	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	380352	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	378454	1	11	9.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	378574	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	378573	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	378657	1	12	8.3	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160-H Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a flow analyzer on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
---------------------	--------------	--------	------------------	---------------------



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order : **CG2107254**

Page : 1 of 6

Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
 Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC WINTER EMS WEEK 3
PO : ----
C-O-C number : ----
Sampler : Kevin Mackey
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 4

Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
 Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 30-Dec-2021 08:50
Date Analysis Commenced : 30-Dec-2021
Issue Date : 07-Jan-2022 13:28

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Erin Sanchez		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Microbiology, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

Page : 2 of 6
Work Order : CG2107254
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WINTER EMS WEEK 3



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 378397)											
CG2107231-001	Anonymous	solids, total suspended [TSS]	----	E160-H	3.0	mg/L	20.3	21.5	1.2	Diff <2x LOR	----
Physical Tests (QC Lot: 378696)											
CG2107244-001	Anonymous	pH	----	E108	0.10	pH units	7.75	7.76	0.129%	4%	----
Anions and Nutrients (QC Lot: 378433)											
CG2107244-007	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.125	mg/L	5.01	5.06	1.07%	20%	----
Anions and Nutrients (QC Lot: 378454)											
CG2107244-007	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 378573)											
CG2107256-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0200	mg/L	0.0942	0.0960	0.0018	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 378574)											
CG2107256-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.100	mg/L	272	277	1.85%	20%	----
Anions and Nutrients (QC Lot: 378657)											
CG2107254-002	WWTP EFFLUENT	phosphorus, total	7723-14-0	E372-U	0.0100	mg/L	0.310	0.321	3.64%	20%	----
Bacteriological Tests (QC Lot: 379452)											
CG2107254-004	ELK RIVER OUTFALL	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	3	2	1	Diff <2x LOR	----
Aggregate Organics (QC Lot: 378779)											
CG2107235-010	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 380352)											
CG2107244-003	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	14	15	0.8	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 378397)						
solids, total suspended [TSS]	----	E160-H	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 378433)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 378454)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 378573)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 378574)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 378657)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Bacteriological Tests (QCLot: 379452)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 378779)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 380352)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 378397)									
solids, total suspended [TSS]	----	E160-H	3	mg/L	150 mg/L	95.5	85.0	115	----
Physical Tests (QCLot: 378696)									
pH	----	E108	----	pH units	7 pH units	99.4	98.6	101	----
Anions and Nutrients (QCLot: 378433)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 378454)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	97.8	80.0	120	----
Anions and Nutrients (QCLot: 378573)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.3	90.0	110	----
Anions and Nutrients (QCLot: 378574)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 378657)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	87.8	80.0	120	----
Aggregate Organics (QCLot: 378779)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	# 73.3	85.0	115	LCS-ND
Aggregate Organics (QCLot: 380352)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	108	85.0	115	----

Qualifiers

Qualifier	Description
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 378433)										
CG2107244-011	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.113 mg/L	0.1 mg/L	113	75.0	125	----
Anions and Nutrients (QCLot: 378454)										
CG2107244-008	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0502 mg/L	0.05 mg/L	100	70.0	130	----
Anions and Nutrients (QCLot: 378573)										
CG2107256-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.452 mg/L	0.5 mg/L	90.5	75.0	125	----
Anions and Nutrients (QCLot: 378574)										
CG2107256-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	ND mg/L	2.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 378657)										
CG2107254-003	ELK RIVER UPSTREAM	phosphorus, total	7723-14-0	E372-U	0.0681 mg/L	0.0676 mg/L	101	70.0	130	----
Aggregate Organics (QCLot: 380352)										
CG2107244-004	Anonymous	chemical oxygen demand [COD]	----	E559-L	103 mg/L	100 mg/L	103	75.0	125	----



Vancouver BC, 1988 Triumph Street, V5L 1K5. Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 99A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5195 Toll Free: 1-800-668-9878 Fax: 780-513-2191
 Fort McMurray AB, Bay 1, 245 Macdonald Cr. T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 Edmonton AB, 9936 - 57th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-9897
 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-688-8370, Toll Free: 1-800-667-7645 Fax: 306

Environmental Division
 Calgary

Work Order Reference
CG2107254



Telephone: 1 403 407 1600

SEND REPORT TO:

CHAIN OF CUSTODY FORM

COMPANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION			ATTN:	PATRICK MAJER	ANALYSIS REQUESTED:	
ADDRESS:	1505 - 17TH AVENUE SOUTH WEST						
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2		
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Kevin Mackey		
PROJECT NAME AND NO.:	FARUC - Winter EMS week 3			QUOTE NO.:			
PO NO.:		ALS CONTACT:	Patrik Woyciak				
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: <u>pmajer@skircr.com</u> <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:						

WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD6	COD	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME												
	WWTP Influent Routine	2021-12-29	9:45	Water		X	X								9.8°C
	WWTP Influent BOD	2021-12-29	1	Water									X		
	WWTP Effluent Routine	2021-12-29	10:00	Water		X	X							X	10.5°C
	WWTP Effluent BOD	2021-12-29	1	Water									X		
	WWTP Effluent Nutrients	2021-12-29	1	Water				X	X	X	X	X			
	WWTP Effluent Bacteriological	2021-12-29	1	Water	X										
	Elk River Upstream Routine	2021-12-29	10:30	Water		X	X								8.4°C
	Elk River Upstream Nutrients	2021-12-29	1	Water				X	X	X	X	X			
	Elk River Upstream Bacteriological	2021-12-29	1	Water	X										
	Elk River @ Outfall Routine	2021-12-29	10:15	Water		X	X								8.9°C
	Elk River @ Outfall Nutrients	2021-12-29	1	Water				X	X	X	X	X			
	Elk River @ Outfall Bacteriological	2021-12-29	1	Water	X										
	Elk River Downstream Routine	2021-12-29	10:45	Water		X	X								did not sample unsafe water access
	Elk River Downstream Nutrients	2021-12-29	1	Water				X	X	X	X	X			
	Elk River Downstream Bacteriological	2021-12-29	1	Water	X										

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	DATE:	2021-12-29	RECEIVED BY:	DATE:	12/30
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)	Kevin Mackey	TIME:	11:15	Rafael	TIME:	8:50
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	RELINQUISHED BY:	DATE:		RECEIVED BY:	DATE:	
SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com	TIME:			TIME:		
FOR LAB USE ONLY		Cooler Seal Intact?	Sample Temperature: _____ °C	Cooling Method?			
		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None			

200



CERTIFICATE OF ANALYSIS

Work Order : **CG2200120**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : 4FARUC - WINTER EMS WEEK
PO : ----
C-O-C number : ----
Sampler : KM
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 06-Jan-2022 10:00
Date Analysis Commenced : 06-Jan-2022
Issue Date : 12-Jan-2022 11:28

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Erin Sanchez		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

Sub-Matrix: Water					Client sample ID	WWTP INFLUENT	WWTP EFFLUENT	----	----	----
(Matrix: Water)					Client sampling date / time	05-Jan-2022 10:30	05-Jan-2022 10:45	----	----	----
Analyte	CAS Number	Method	LOR	Unit	CG2200120-001 Result	CG2200120-002 Result	-----	-----	-----	
Physical Tests										
pH	----	E108	0.10	pH units	8.00	6.88	----	----	----	
solids, total suspended [TSS]	----	E160	3.0	mg/L	242	<3.0	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0169	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	40.3	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	0.0110	----	----	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	0.0989	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.124 ^{DLHC}	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	40.3	----	----	----	
Bacteriological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	9	----	----	----	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	186	<2.0	----	----	----	
chemical oxygen demand [COD]	----	E559-L	10	mg/L	----	11	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2200120	Page	: 1 of 6
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: 4FARUC - WINTER EMS WEEK	Date Samples Received	: 06-Jan-2022 10:00
PO	: ----	Issue Date	: 12-Jan-2022 11:28
C-O-C number	: ----		
Sampler	: KM		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	05-Jan-2022	----	----	----		06-Jan-2022	3 days	1 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP INFLUENT	E550	05-Jan-2022	----	----	----		06-Jan-2022	3 days	1 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E559-L	05-Jan-2022	----	----	----		10-Jan-2022	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	05-Jan-2022	07-Jan-2022	----	----		07-Jan-2022	28 days	2 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE WWTP EFFLUENT	E378-U	05-Jan-2022	----	----	----		06-Jan-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO3-L	05-Jan-2022	----	----	----		07-Jan-2022	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO2-L	05-Jan-2022	----	----	----		07-Jan-2022	3 days	2 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	05-Jan-2022	08-Jan-2022	----	----		08-Jan-2022	28 days	3 days	✓	
Bacteriological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	05-Jan-2022	----	----	----		06-Jan-2022	30 hrs	25 hrs	✓	
Physical Tests : pH by Meter											
HDPE WWTP EFFLUENT	E108	05-Jan-2022	----	----	----		06-Jan-2022	0.25 hrs	26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP INFLUENT	E108	05-Jan-2022	----	----	----		06-Jan-2022	0.25 hrs	27 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE WWTP EFFLUENT	E160	05-Jan-2022	----	----	----		08-Jan-2022	7 days	3 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE WWTP INFLUENT	E160	05-Jan-2022	----	----	----		08-Jan-2022	7 days	3 days	✓	

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	382589	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	382064	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	383628	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	381760	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	382274	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	382273	1	20	5.0	5.0	✔
pH by Meter	E108	381816	1	20	5.0	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	382550	1	18	5.5	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	381796	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	381711	1	19	5.2	5.0	✔
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	382589	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	382064	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	383628	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	381760	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	382274	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	382273	1	20	5.0	5.0	✔
pH by Meter	E108	381816	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	381796	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	381711	1	19	5.2	5.0	✔
Method Blanks (MB)							
Ammonia by Fluorescence	E298	382589	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	382064	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	383628	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	381760	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	382274	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	382273	1	20	5.0	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	382550	1	18	5.5	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	381796	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	381711	1	19	5.2	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	382589	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	383628	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	381760	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	382274	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	382273	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	381796	1	20	5.0	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a flow analyzer on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
---------------------	--------------	--------	------------------	---------------------



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : CG2200120

Page : 1 of 6

Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : 4FARUC - WINTER EMS WEEK
PO : ----
C-O-C number : ----
Sampler : KM
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 2
No. of samples analysed : 2

Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 06-Jan-2022 10:00
Date Analysis Commenced : 06-Jan-2022
Issue Date : 12-Jan-2022 11:28

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
Matrix Spike (MS) Report; Recovery and Acceptance Limits
Reference Material (RM) Report; Recovery and Acceptance Limits
Method Blank (MB) Report; Recovery and Acceptance Limits
Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Erin Sanchez, Harpreet Chawla, Parker Sgarbossa, Ruifang Zheng, Sara Niroomand, Sunil Palak, and Sunil Palak.

Page : 2 of 6
Work Order : CG2200120
Client : Fernie Alpine Resort Utilities Corporation
Project : 4FARUC - WINTER EMS WEEK



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 381711)											
FC2200021-003	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	73.1	76.5	4.54%	20%	----
Physical Tests (QC Lot: 381816)											
CG2200120-001	WWTP INFLUENT	pH	----	E108	0.10	pH units	8.00	8.01	0.125%	4%	----
Anions and Nutrients (QC Lot: 381760)											
CG2200113-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0882	0.0828	6.30%	20%	----
Anions and Nutrients (QC Lot: 381796)											
CG2200099-021	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 382273)											
CG2200135-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 382274)											
CG2200135-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	13.0	13.1	0.243%	20%	----
Anions and Nutrients (QC Lot: 382589)											
CG2200096-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0174	0.0158	0.0016	Diff <2x LOR	----
Bacteriological Tests (QC Lot: 382550)											
CG2200127-002	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 382064)											
CG2200099-009	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 383628)											
CG2200099-009	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 381711)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 381760)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 381796)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 382273)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 382274)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 382589)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Bacteriological Tests (QCLot: 382550)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 382064)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 383628)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 381711)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	97.4	85.0	115	----
Physical Tests (QCLot: 381816)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Anions and Nutrients (QCLot: 381760)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	95.3	80.0	120	----
Anions and Nutrients (QCLot: 381796)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	84.1	80.0	120	----
Anions and Nutrients (QCLot: 382273)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 382274)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 382589)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	115	85.0	115	----
Aggregate Organics (QCLot: 382064)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	87.4	85.0	115	----
Aggregate Organics (QCLot: 383628)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	99.7	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 381760)										
CG2200120-002	WWTP EFFLUENT	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 381796)										
CG2200099-022	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0624 mg/L	0.0676 mg/L	92.3	70.0	130	----
Anions and Nutrients (QCLot: 382273)										
CG2200135-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.486 mg/L	0.5 mg/L	97.2	75.0	125	----
Anions and Nutrients (QCLot: 382274)										
CG2200135-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	ND mg/L	2.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 382589)										
CG2200116-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Aggregate Organics (QCLot: 383628)										
CG2200099-010	Anonymous	chemical oxygen demand [COD]	----	E559-L	101 mg/L	100 mg/L	101	75.0	125	----




Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 Fax: 780-513-2191
 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS F												
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST		<div style="border: 1px solid black; padding: 5px;"> <p>Environmental Division Calgary Work Order Reference CG2200120</p>  <p>Telephone: +1-403-407-1800</p> </div>														
CITY: CALGARY	PROV: ALBERTA	POSTAL CODE: T2T 0E2														
TEL: 403 - 256 - 8473	FAX: 403 - 244 - 3774	SAMPLER: Kevin Mackey														
PROJECT NAME AND NO.: FARUC - Winter EMS week 4		QUOTE NO.:														
PO NO.:	ALS CONTACT: Patryk Woyciak															
REPORT FORMAT:		<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:														
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH								NOTES (sample specific comments, due dates, etc.)	
		YYYY-MM-DD	TIME													
	WWTP Influent Routine	2022-01-05	10:30	Water		X	X									9.6°C
	WWTP Influent BOD	2022-01-05		Water										X		
	WWTP Effluent Routine	2022-01-05	10:45	Water		X	X							X		11°C
	WWTP Effluent BOD	2022-01-05		Water										X		
	WWTP Effluent Nutrients	2022-01-05		Water				X	X	X	X	X	X			
	WWTP Effluent Bacteriological	2022-01-05		Water	X											
	Elk River Upstream Routine	2022-01-05		Water		X	X									
	Elk River Upstream Nutrients	2022-01-05		Water				X	X	X	X	X				
	Elk River Upstream Bacteriological	2022-01-05		Water	X											River
	Elk River @ Outfall Routine	2022-01-05		Water		X	X									fully
	Elk River @ Outfall Nutrients	2022-01-05		Water				X	X	X	X	X				frozen
	Elk River @ Outfall Bacteriological	2022-01-05		Water	X											
	Elk River Downstream Routine	2022-01-05		Water		X	X									
	Elk River Downstream Nutrients	2022-01-05		Water				X	X	X	X	X				
	Elk River Downstream Bacteriological	2021-12-29		Water	X											

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	DATE:	2022-01-05	RECEIVED BY:	DATE:	01/06
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)	Carter Barrett	TIME:	11:15	<i>[Signature]</i>	TIME:	10:00
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	RELINQUISHED BY:	DATE:		RECEIVED BY:	DATE:	
SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO: wastewater@skifernie.com	TIME:			TIME:		
		FOR LAB USE ONLY					
		Cooler Seal Intact?	Sample Temperature: 1 °C		Cooling Method?		
		Yes ___ No ___ N/A	Frozen? Yes ___ No ___		Icepacks ___ Ice ___ None		



CERTIFICATE OF ANALYSIS

Work Order	: CG2200369	Page	: 1 of 3
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC -WINTER EMS WEEK 5	Date Samples Received	: 13-Jan-2022 08:55
PO	: ----	Date Analysis	: 13-Jan-2022
		Commenced	
C-O-C number	: ----	Issue Date	: 21-Jan-2022 16:25
Sampler	: Kevin mackey		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Erin Sanchez		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
RRV	Reported result verified by repeat analysis.



Analytical Results

CG2200369-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP INFLUENT

Client sampling date / time: 12-Jan-2022 10:30

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	7.86	0.10	pH units	E108	13-Jan-2022	13-Jan-2022	386285
solids, total suspended [TSS]	----	198	3.0	mg/L	E160	-	18-Jan-2022	388352
Aggregate Organics								
biochemical oxygen demand [BOD]	----	104	20.0	mg/L	E550	-	14-Jan-2022	387149

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

Analytical Results

CG2200369-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP EFFLUENT

Client sampling date / time: 12-Jan-2022 10:35

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	7.69	0.10	pH units	E108	13-Jan-2022	13-Jan-2022	386285
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	18-Jan-2022	388352
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0276	0.0050	mg/L	E298	13-Jan-2022	13-Jan-2022	386220
nitrate (as N)	14797-55-8	42.5 ^{RRV}	0.0250	mg/L	E235.NO3-L	13-Jan-2022	13-Jan-2022	386329
nitrite (as N)	14797-65-0	0.0121	0.0050	mg/L	E235.NO2-L	13-Jan-2022	13-Jan-2022	386328
phosphate, ortho-, dissolved (as P)	14265-44-2	0.227	0.0050	mg/L	E378-U	13-Jan-2022	13-Jan-2022	386258
phosphorus, total	7723-14-0	0.222 ^{DLHC}	0.0100	mg/L	E372-U	14-Jan-2022	14-Jan-2022	386239
nitrate + nitrite (as N)	----	42.5	0.0255	mg/L	EC235.N+N	-	14-Jan-2022	-
Bacteriological Tests								
coliforms, thermotolerant [fecal]	----	2	1	CFU/100mL	E012.FC	-	13-Jan-2022	387169
Aggregate Organics								
biochemical oxygen demand [BOD]	----	<2.0	2.0	mg/L	E550	-	14-Jan-2022	387149
chemical oxygen demand [COD]	----	16	10	mg/L	E559-L	-	14-Jan-2022	387029

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2200369	Page	: 1 of 6
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC -WINTER EMS WEEK 5	Date Samples Received	: 13-Jan-2022 08:55
PO	: ----	Issue Date	: 21-Jan-2022 16:25
C-O-C number	: ----		
Sampler	: Kevin mackey		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	12-Jan-2022	----	----	----		14-Jan-2022	3 days	2 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP INFLUENT	E550	12-Jan-2022	----	----	----		14-Jan-2022	3 days	2 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E559-L	12-Jan-2022	----	----	----		14-Jan-2022	28 days	2 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	12-Jan-2022	13-Jan-2022	----	----		13-Jan-2022	28 days	1 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE WWTP EFFLUENT	E378-U	12-Jan-2022	----	----	----		13-Jan-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO3-L	12-Jan-2022	----	----	----		13-Jan-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO2-L	12-Jan-2022	----	----	----		13-Jan-2022	3 days	1 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	12-Jan-2022	14-Jan-2022	----	----		14-Jan-2022	28 days	2 days	✓
Bacteriological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	12-Jan-2022	----	----	----		13-Jan-2022	30 hrs	25 hrs	✓
Physical Tests : pH by Meter										
HDPE WWTP EFFLUENT	E108	12-Jan-2022	----	----	----		13-Jan-2022	0.25 hrs	26 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE WWTP INFLUENT	E108	12-Jan-2022	----	----	----		13-Jan-2022	0.25 hrs	27 hrs	* EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	12-Jan-2022	----	----	----		18-Jan-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	12-Jan-2022	----	----	----		18-Jan-2022	7 days	6 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	386220	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	387149	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	387029	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	386258	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	386329	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	386328	1	19	5.2	5.0	✔
pH by Meter	E108	386285	1	18	5.5	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	387169	1	16	6.2	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	386239	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	388352	1	20	5.0	5.0	✔
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	386220	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	387149	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	387029	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	386258	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	386329	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	386328	1	19	5.2	5.0	✔
pH by Meter	E108	386285	1	18	5.5	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	386239	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	388352	1	20	5.0	5.0	✔
Method Blanks (MB)							
Ammonia by Fluorescence	E298	386220	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	387149	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	387029	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	386258	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	386329	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	386328	1	19	5.2	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	387169	1	16	6.2	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	386239	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	388352	1	20	5.0	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	386220	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	387029	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	386258	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	386329	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	386328	1	19	5.2	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	386239	1	20	5.0	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ±0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a flow analyzer on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
---------------------	--------------	--------	------------------	---------------------



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : CG2200369

Page : 1 of 6

Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC -WINTER EMS WEEK 5
PO : ----
C-O-C number : ----
Sampler : Kevin mackey
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 2
No. of samples analysed : 2

Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 13-Jan-2022 08:55
Date Analysis Commenced : 13-Jan-2022
Issue Date : 21-Jan-2022 16:25

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
● Matrix Spike (MS) Report; Recovery and Acceptance Limits
● Reference Material (RM) Report; Recovery and Acceptance Limits
● Method Blank (MB) Report; Recovery and Acceptance Limits
● Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Anthony Calero, Erin Sanchez, Harpreet Chawla, Katarzyna Glinka, Parker Sgarbossa, Ruifang Zheng, and Sunil Palak.

Page : 2 of 6
Work Order : CG2200369
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC -WINTER EMS WEEK 5



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 386285)											
CG2200369-001	WWTP INFLUENT	pH	----	E108	0.10	pH units	7.86	7.90	0.508%	4%	----
Physical Tests (QC Lot: 388352)											
CG2200327-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	349	364	4.15%	20%	----
Anions and Nutrients (QC Lot: 386220)											
CG2200353-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0579	0.0567	2.09%	20%	----
Anions and Nutrients (QC Lot: 386239)											
CG2200344-003	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0101	0.0100	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 386258)											
CG2200365-007	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0278	0.0271	2.23%	20%	----
Anions and Nutrients (QC Lot: 386328)											
CG2200370-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0574	0.0589	2.58%	20%	----
Anions and Nutrients (QC Lot: 386329)											
CG2200370-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	8.70	8.59	1.25%	20%	----
Bacteriological Tests (QC Lot: 387169)											
CG2200325-002	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	2	CFU/100mL	2	2	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 387029)											
CG2200320-009	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 387149)											
CG2200356-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 388352)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 386220)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 386239)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 386258)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 386328)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 386329)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Bacteriological Tests (QCLot: 387169)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 387029)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 387149)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 386285)									
pH	----	E108	----	pH units	7 pH units	99.7	98.6	101	----
Physical Tests (QCLot: 388352)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	91.6	85.0	115	----
Anions and Nutrients (QCLot: 386220)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 386239)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	92.0	80.0	120	----
Anions and Nutrients (QCLot: 386258)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	97.7	80.0	120	----
Anions and Nutrients (QCLot: 386328)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 386329)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Aggregate Organics (QCLot: 387029)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	102	85.0	115	----
Aggregate Organics (QCLot: 387149)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	93.5	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 386220)										
CG2200365-008	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0996 mg/L	0.1 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 386239)										
CG2200350-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0580 mg/L	0.0676 mg/L	85.8	70.0	130	----
Anions and Nutrients (QCLot: 386258)										
CG2200365-008	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0501 mg/L	0.05 mg/L	100	70.0	130	----
Anions and Nutrients (QCLot: 386328)										
CG2200371-005	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.472 mg/L	0.5 mg/L	94.4	75.0	125	----
Anions and Nutrients (QCLot: 386329)										
CG2200371-005	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.35 mg/L	2.5 mg/L	94.2	75.0	125	----
Aggregate Organics (QCLot: 387029)										
CG2200320-010	Anonymous	chemical oxygen demand [COD]	----	E559-L	102 mg/L	100 mg/L	102	75.0	125	----



Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 Fax: 780-513-2191
 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION			ATTN:	PATRICK MAJER	ANALYSIS REQUESTED:									
ADDRESS:	1505 - 17TH AVENUE SOUTH WEST														
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2										
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Kevin Mackey										
PROJECT NAME AND NO.:	FARUC - Winter EMS week 5			QUOTE NO.:											
PO NO.:		ALS CONTACT:	Patrik Woyciak												
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:														

WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME												
	WWTP Influent Routine	2022-01-12	10:30	Water		X	X								
	WWTP Influent BOD	2022-01-12	10:30	Water									X		
	WWTP Effluent Routine	2022-01-12	10:35	Water		X	X							X	
	WWTP Effluent BOD	2022-01-12	10:35	Water									X		
	WWTP Effluent Nutrients	2022-01-12	10:35	Water				X	X	X	X	X			
	WWTP Effluent Bacteriological	2022-01-12	10:35	Water	X										
	Elk River Upstream Routine	2022-01-12		Water		X	X								RIVER FROZEN
	Elk River Upstream Nutrients	2022-01-12		Water				X	X	X	X	X			RIVER FROZEN
	Elk River Upstream Bacteriological	2022-01-12		Water	X										RIVER FROZEN
	Elk River @ Outfall Routine	2022-01-12		Water		X									RIVER FROZEN
	Elk River @ Outfall Nutrients	2022-01-12		Water											RIVER FROZEN
	Elk River @ Outfall Bacteriological	2022-01-12		Water	X										RIVER FROZEN
	Elk River Downstream Routine	2022-01-12		Water		X									RIVER FROZEN
	Elk River Downstream Nutrients	2022-01-12		Water											RIVER FROZEN
	Elk River Downstream Bacteriological	2022-01-12		Water	X										RIVER FROZEN

FOR LAB USE ONLY

Environmental Division
 Calgary
 Work Order Reference
CG2200369

Telephone : +1 403 407 1800

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	Carter Barrett	DATE:	2022-01-12	RECEIVED BY:	[Signature]	DATE:	1/13/22
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)	TIME:	11:15	DATE:		RECEIVED BY:		DATE:	
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	TIME:		DATE:		RECEIVED BY:		DATE:	

SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com	FOR LAB USE ONLY
		Cooler Seal Intact? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A Sample Temperature: <u>7</u> °C Cooling Method? <input type="checkbox"/> Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None



CERTIFICATE OF ANALYSIS

Work Order : **CG2200628**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : 6FARUC -WINTER EMS WEEK
PO : ----
C-O-C number : ----
Sampler : KEVIN MACKERY
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 20-Jan-2022 08:50
Date Analysis Commenced : 20-Jan-2022
Issue Date : 26-Jan-2022 16:36

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Erin Sanchez		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

Sub-Matrix: Water					Client sample ID	WWTP INFLUENT	EFFLUENT	----	----	----
(Matrix: Water)					Client sampling date / time	19-Jan-2022 10:30	19-Jan-2022 10:35	----	----	----
Analyte	CAS Number	Method	LOR	Unit	CG2200628-001 Result	CG2200628-002 Result	-----	-----	-----	
Physical Tests										
pH	----	E108	0.10	pH units	8.05	7.50	----	----	----	
solids, total suspended [TSS]	----	E160	3.0	mg/L	107	<3.0	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0247	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	30.9	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	0.0079	----	----	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	0.104 ^{DLHC}	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.109 ^{DLHC}	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	30.9	----	----	----	
Bacteriological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	1	----	----	----	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	152	<2.0	----	----	----	
chemical oxygen demand [COD]	----	E559-L	10	mg/L	----	17	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2200628	Page	: 1 of 6
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: 6FARUC -WINTER EMS WEEK	Date Samples Received	: 20-Jan-2022 08:50
PO	: ----	Issue Date	: 26-Jan-2022 16:36
C-O-C number	: ----		
Sampler	: KEVIN MACKERY		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

- Anonymous:** Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] EFFLUENT	E550	19-Jan-2022	----	----	----		20-Jan-2022	3 days	1 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP INFLUENT	E550	19-Jan-2022	----	----	----		20-Jan-2022	3 days	1 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) EFFLUENT	E559-L	19-Jan-2022	----	----	----		21-Jan-2022	28 days	2 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) EFFLUENT	E298	19-Jan-2022	20-Jan-2022	----	----		20-Jan-2022	28 days	1 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE EFFLUENT	E378-U	19-Jan-2022	----	----	----		20-Jan-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE EFFLUENT	E235.NO3-L	19-Jan-2022	----	----	----		20-Jan-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE EFFLUENT	E235.NO2-L	19-Jan-2022	----	----	----		20-Jan-2022	3 days	1 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) EFFLUENT	E372-U	19-Jan-2022	21-Jan-2022	----	----		21-Jan-2022	28 days	2 days	✓	
Bacteriological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) EFFLUENT	E012.FC	19-Jan-2022	----	----	----		20-Jan-2022	30 hrs	24 hrs	✓	
Physical Tests : pH by Meter											
HDPE EFFLUENT	E108	19-Jan-2022	----	----	----		20-Jan-2022	0.25 hrs	23 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP INFLUENT	E108	19-Jan-2022	----	----	----		20-Jan-2022	0.25 hrs	23 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE EFFLUENT	E160	19-Jan-2022	----	----	----		25-Jan-2022	7 days	6 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE WWTP INFLUENT	E160	19-Jan-2022	----	----	----		25-Jan-2022	7 days	6 days	✓	

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	391115	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	391177	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	391761	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	391008	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	391189	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	391190	1	20	5.0	5.0	✔
pH by Meter	E108	390925	1	17	5.8	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	392160	1	14	7.1	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	391172	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	393512	1	20	5.0	5.0	✔
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	391115	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	391177	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	391761	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	391008	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	391189	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	391190	1	20	5.0	5.0	✔
pH by Meter	E108	390925	1	17	5.8	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	391172	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	393512	1	20	5.0	5.0	✔
Method Blanks (MB)							
Ammonia by Fluorescence	E298	391115	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	391177	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	391761	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	391008	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	391189	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	391190	1	20	5.0	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	392160	1	14	7.1	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	391172	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	393512	1	20	5.0	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	391115	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	391761	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	391008	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	391189	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	391190	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	391172	1	20	5.0	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ±0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a flow analyzer on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
---------------------	--------------	--------	------------------	---------------------



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : CG2200628

Page : 1 of 6

Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : 6FARUC -WINTER EMS WEEK
PO : ----
C-O-C number : ----
Sampler : KEVIN MACKERY
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 2
No. of samples analysed : 2

Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 20-Jan-2022 08:50
Date Analysis Commenced : 20-Jan-2022
Issue Date : 26-Jan-2022 16:36

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
● Matrix Spike (MS) Report; Recovery and Acceptance Limits
● Reference Material (RM) Report; Recovery and Acceptance Limits
● Method Blank (MB) Report; Recovery and Acceptance Limits
● Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Erin Sanchez, Harpreet Chawla, Katarzyna Glinka, Parker Sgarbossa, Ruifang Zheng, Sara Niroomand, and Sunil Palak.

Page : 2 of 6
Work Order : CG2200628
Client : Fernie Alpine Resort Utilities Corporation
Project : 6FARUC -WINTER EMS WEEK



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 390925)											
CG2200593-001	Anonymous	pH	----	E108	0.10	pH units	8.30	8.31	0.120%	4%	----
Physical Tests (QC Lot: 393512)											
FC2200109-003	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	51.9	51.7	0.386%	20%	----
Anions and Nutrients (QC Lot: 391008)											
CG2200627-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 391115)											
CG2200626-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.250	mg/L	17.9	18.3	2.28%	20%	----
Anions and Nutrients (QC Lot: 391172)											
CG2200627-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 391189)											
CG2200631-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	5.14	5.13	0.204%	20%	----
Anions and Nutrients (QC Lot: 391190)											
CG2200631-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0252	0.0257	0.0005	Diff <2x LOR	----
Bacteriological Tests (QC Lot: 392160)											
CG2200618-002	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 391177)											
CG2200587-005	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 391761)											
CG2200587-002	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 393512)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 391008)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 391115)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 391172)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 391189)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 391190)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Bacteriological Tests (QCLot: 392160)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 391177)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 391761)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 390925)									
pH	----	E108	----	pH units	7 pH units	99.8	98.6	101	----
Physical Tests (QCLot: 393512)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	99.7	85.0	115	----
Anions and Nutrients (QCLot: 391008)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	96.8	80.0	120	----
Anions and Nutrients (QCLot: 391115)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.2	85.0	115	----
Anions and Nutrients (QCLot: 391172)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	99.8	80.0	120	----
Anions and Nutrients (QCLot: 391189)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 391190)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	102	90.0	110	----
Aggregate Organics (QCLot: 391177)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	90.2	85.0	115	----
Aggregate Organics (QCLot: 391761)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	114	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

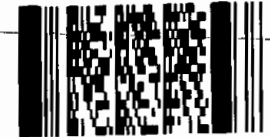
					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 391008)										
CG2200627-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0495 mg/L	0.05 mg/L	99.0	70.0	130	----
Anions and Nutrients (QCLot: 391115)										
CG2200636-015	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0904 mg/L	0.1 mg/L	90.4	75.0	125	----
Anions and Nutrients (QCLot: 391172)										
CG2200627-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0571 mg/L	0.0676 mg/L	84.5	70.0	130	----
Anions and Nutrients (QCLot: 391189)										
CG2200636-015	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.65 mg/L	2.5 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 391190)										
CG2200636-015	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.531 mg/L	0.5 mg/L	106	75.0	125	----
Aggregate Organics (QCLot: 391761)										
CG2200587-003	Anonymous	chemical oxygen demand [COD]	----	E559-L	105 mg/L	100 mg/L	105	75.0	125	----



SEND REPORT TO:

CHAIN OF CUSTODY FORM

Environmental Division
 Calgary
 Work Order Reference
CG2200628



Telephone : +1 403 407 1800

COMPANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN:	PATRICK MAJER	ANALYSIS REQUESTED:																
ADDRESS:	1505 - 17TH AVENUE SOUTH WEST										Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	comments, due dates, etc.)
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2																
TEL:	403-256-8473	FAX:	403-244-3774	SAMPLER:	Kevin Mackey																
PROJECT NAME AND NO.:	FARJC - Winter EMS week 5 Week 6			QUOTE NO.:																	
PO NO.:		ALS CONTACT:	Patrik Woyciak																		
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmaier@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:																				

WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	comments, due dates, etc.)
		YYYY-MM-DD	TIME												
	WWTP Influent Routine	2022-01-19	10:30	Water		X	X								9°C
	WWTP Influent BOD	2022-01-19	10:30	Water									X		1
	WWTP Effluent Routine	2022-01-19	10:35	Water		X	X							X	12°C
	WWTP Effluent BOD	2022-01-19	10:35	Water									X		1
	WWTP Effluent Nutrients	2022-01-19	10:35	Water				X	X	X	X	X			
	WWTP Effluent Bacteriological	2022-01-19	10:35	Water	X										
	Elk River Upstream Routine	2022-01-19		Water		X	X								
	Elk River Upstream Nutrients	2022-01-19		Water				X	X	X	X	X			River
	Elk River Upstream Bacteriological	2022-01-19		Water	X										Frozen
	Elk River @ Outfall Routine	2022-01-19		Water		X	X								
	Elk River @ Outfall Nutrients	2022-01-19		Water				X	X	X	X	X			Sketchy
	Elk River @ Outfall Bacteriological	2022-01-19		Water	X										Ice
	Elk River Downstream Routine	2022-01-19		Water		X	X								SELF
	Elk River Downstream Nutrients	2022-01-19		Water				X	X	X	X	X			
	Elk River Downstream Bacteriological	2022-01-19		Water	X										

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	DATE:	2022-01-19	RECEIVED BY:	DATE:	Jan 20, 2022
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)	Kevin Mackey	TIME:	11:15	<i>[Signature]</i>	TIME:	8:50
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	RELINQUISHED BY:	DATE:		RECEIVED BY:	DATE:	
SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com	TIME:			TIME:		
		FOR LAB USE ONLY					
		Cooler Seal Intact?	Sample Temperature: 6°C		Cooling Method?		
		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None		



CERTIFICATE OF ANALYSIS

Work Order	: CG2202049	Page	: 1 of 3
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC WINTER EMS WEEK 5	Date Samples Received	: 24-Feb-2022 09:10
PO	: ----	Date Analysis	: 24-Feb-2022
		Commenced	
C-O-C number	: ----	Issue Date	: 02-Mar-2022 13:24
Sampler	: KEVIN MACKEY		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Erin Sanchez		Inorganics, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
BODP	<i>BOD dilution results differed by more than 30% RPD. Precision of reported BOD result may be less than usual.</i>
DLHC	<i>Detection Limit Raised: Dilution required due to high concentration of test analyte(s).</i>



Analytical Results

CG2202049-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP INFLUENT -

Client sampling date / time: 23-Feb-2022 10:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.08	0.10	pH units	E108	24-Feb-2022	24-Feb-2022	417135
solids, total suspended [TSS]	----	221	3.0	mg/L	E160	-	01-Mar-2022	419434
Aggregate Organics								
biochemical oxygen demand [BOD]	----	222 ^{BODP}	75.0	mg/L	E550	-	24-Feb-2022	417470

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

Analytical Results

CG2202049-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP EFFLUENT -

Client sampling date / time: 23-Feb-2022 10:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	7.74	0.10	pH units	E108	24-Feb-2022	24-Feb-2022	417135
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	01-Mar-2022	419434
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0093	0.0050	mg/L	E298	24-Feb-2022	24-Feb-2022	417223
nitrate (as N)	14797-55-8	42.6	0.0050	mg/L	E235.NO3-L	24-Feb-2022	24-Feb-2022	417364
nitrite (as N)	14797-65-0	0.0068	0.0010	mg/L	E235.NO2-L	24-Feb-2022	24-Feb-2022	417365
phosphate, ortho-, dissolved (as P)	14265-44-2	0.160	0.0100	mg/L	E378-U	24-Feb-2022	24-Feb-2022	417050
phosphorus, total	7723-14-0	0.171 ^{DLHC}	0.0040	mg/L	E372-U	26-Feb-2022	26-Feb-2022	417204
nitrate + nitrite (as N)	----	42.6	0.0051	mg/L	EC235.N+N	-	25-Feb-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	19	1	CFU/100mL	E012.FC	-	24-Feb-2022	418317
Aggregate Organics								
biochemical oxygen demand [BOD]	----	2.4	2.0	mg/L	E550	-	24-Feb-2022	417470

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2202049	Page	: 1 of 7
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC WINTER EMS WEEK 5	Date Samples Received	: 24-Feb-2022 09:10
PO	: ----	Issue Date	: 02-Mar-2022 13:24
C-O-C number	: ----		
Sampler	: KEVIN MACKEY		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	23-Feb-2022	----	----	----		24-Feb-2022	3 days	1 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP INFLUENT	E550	23-Feb-2022	----	----	----		24-Feb-2022	3 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	23-Feb-2022	24-Feb-2022	----	----		24-Feb-2022	28 days	1 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE WWTP EFFLUENT	E378-U	23-Feb-2022	----	----	----		24-Feb-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO3-L	23-Feb-2022	----	----	----		24-Feb-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO2-L	23-Feb-2022	----	----	----		24-Feb-2022	3 days	1 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	23-Feb-2022	26-Feb-2022	----	----		26-Feb-2022	28 days	3 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	23-Feb-2022	----	----	----		24-Feb-2022	30 hrs	24 hrs	✓
Physical Tests : pH by Meter										
HDPE WWTP EFFLUENT	E108	23-Feb-2022	----	----	----		24-Feb-2022	0.25 hrs	26 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE WWTP INFLUENT	E108	23-Feb-2022	----	----	----		24-Feb-2022	0.25 hrs	26 hrs	* EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	23-Feb-2022	----	----	----		01-Mar-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	23-Feb-2022	----	----	----		01-Mar-2022	7 days	6 days	✓

Legend & Qualifier Definitions

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

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



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	417223	1	5	20.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	417470	1	18	5.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	417050	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	417364	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	417365	1	19	5.2	5.0	✓
pH by Meter	E108	417135	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	418317	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	417204	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	419434	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	417223	1	5	20.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	417470	1	18	5.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	417050	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	417364	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	417365	1	19	5.2	5.0	✓
pH by Meter	E108	417135	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	417204	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	419434	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	417223	1	5	20.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	417470	1	18	5.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	417050	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	417364	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	417365	1	19	5.2	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	418317	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	417204	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	419434	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	417223	1	5	20.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	417050	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	417364	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	417365	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	417204	1	20	5.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

Page : 7 of 7
Work Order : CG2202049
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WINTER EMS WEEK 5



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : **CG2202049**

Page : 1 of 6

Client : Fernie Alpine Resort Utilities Corporation
 Contact : Patrick Majer
 Address : 1505 - 17TH AVENUE SW
 Calgary AB Canada T2T 0E2
 Telephone : 403 254 7669
 Project : FARUC WINTER EMS WEEK 5
 PO : ----
 C-O-C number : ----
 Sampler : KEVIN MACKEY
 Site : ----
 Quote number : CG21-FARU100-0002
 No. of samples received : 2
 No. of samples analysed : 2

Laboratory : Calgary - Environmental
 Account Manager : Patryk Wojciak
 Address : 2559 29th Street NE
 Calgary, Alberta Canada T1Y 7B5
 Telephone : +1 403 407 1800
 Date Samples Received : 24-Feb-2022 09:10
 Date Analysis Commenced : 24-Feb-2022
 Issue Date : 02-Mar-2022 13:24

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	Position	Laboratory Department
Erin Sanchez		Inorganics, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta

Page : 2 of 6
Work Order : CG2202049
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WINTER EMS WEEK 5



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 417135)											
CG2202029-001	Anonymous	pH	----	E108	0.10	pH units	8.69	8.73	0.459%	4%	----
Physical Tests (QC Lot: 419434)											
CG2202029-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 417050)											
CG2202023-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0031	0.0029	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 417204)											
CG2202032-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.100	mg/L	3.57	3.71	3.90%	20%	----
Anions and Nutrients (QC Lot: 417223)											
CG2202038-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 417364)											
CG2201833-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.0608	0.0573	0.0035	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 417365)											
CG2201833-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Microbiological Tests (QC Lot: 418317)											
FJ2200487-002	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 417470)											
CG2202057-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	2.3	14.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 419434)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 417050)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 417204)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 417223)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 417364)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 417365)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Microbiological Tests (QCLot: 418317)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 417470)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 417135)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 419434)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 417050)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	91.2	80.0	120	----
Anions and Nutrients (QCLot: 417204)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	98.5	80.0	120	----
Anions and Nutrients (QCLot: 417223)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	93.1	85.0	115	----
Anions and Nutrients (QCLot: 417364)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100.0	90.0	110	----
Anions and Nutrients (QCLot: 417365)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.8	90.0	110	----
Aggregate Organics (QCLot: 417470)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	89.7	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**


					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 417050)										
CG2202023-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0494 mg/L	0.05 mg/L	98.9	70.0	130	----
Anions and Nutrients (QCLot: 417204)										
CG2202032-002	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.0676 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 417223)										
CG2202043-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 417364)										
CG2202067-017	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.39 mg/L	2.5 mg/L	95.6	75.0	125	----
Anions and Nutrients (QCLot: 417365)										
CG2202067-017	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.480 mg/L	0.5 mg/L	95.9	75.0	125	----



SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:											
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST															
CITY: CALGARY	PROV: ALBERTA	POSTAL CODE: T2T 0E2													
TEL: 403 - 256 - 8473	FAX: 403 - 244 - 3774	SAMPLER: Kevin Mackey													
PROJECT NAME AND NO.: FARUC Winter EMS week 5		QUOTE NO:													
PO NO:	ALS CONTACT: Patryk Wojciak														
REPORT FORMAT:		<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com													
		<input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:													
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME												
	WWTP Influent Routine	2022-2-23	10:00	Water		X	X								9.1 ^u
	WWTP Influent BOD	2022-2-23	10:00	Water									X		
	WWTP Effluent Routine	2022-2-23	10:00	Water		X	X								11-9 ^u
	WWTP Effluent BOD	2022-2-23	10:00	Water									X		
	WWTP Effluent Nutrients	2022-2-23	10:00	Water				X	X	X	X	X			
	WWTP Effluent Bacteriological	2022-2-23	10:00	Water	X										
<div data-bbox="1354 860 1743 1234" data-label="Complex-Block"> <p>Environmental Division Calgary Work Order Reference CG2202049</p>  <p>Telephone : +1 403 407 1800</p> </div>															
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)		RELINQUISHED BY: Kevin Mackey		DATE: 2022-2-23		RECEIVED BY: <i>[Signature]</i>		DATE: 2/23/22		TIME: 10:00		TIME: 10:10	
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)		RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:		TIME:		TIME:	
INVOICE FORMAT:		<input checked="" type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX													
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skiferne.com		FOR LAB USE ONLY		Cooler Seal Intact? Yes No N/A		Sample Temperature: 3 °C		Frozen? Yes No		Cooling Method? Icepacks Ice None			

FOR LAB USE ONLY



CERTIFICATE OF ANALYSIS

Work Order : **CG2203658**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC- SPRING WEEK1
PO : ----
C-O-C number : ----
Sampler : Kevin Mackey
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 31-Mar-2022 10:38
Date Analysis Commenced : 31-Mar-2022
Issue Date : 06-Apr-2022 13:39

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Erin Sanchez		Inorganics, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

Sub-Matrix: Water					Client sample ID	WWTP INFLUENT	WWTP EFFLUENT	ELK RIVER UPSTREAM	ELK RIVER @ OUTFALL	ELK RIVER DOWNSTREAM
(Matrix: Water)					Client sampling date / time	30-Mar-2022 09:30	30-Mar-2022 09:30	30-Mar-2022 10:20	30-Mar-2022 10:10	30-Mar-2022 10:00
Analyte	CAS Number	Method	LOR	Unit	CG2203658-001	CG2203658-002	CG2203658-003	CG2203658-004	CG2203658-005	
					Result	Result	Result	Result	Result	
Physical Tests										
pH	----	E108	0.10	pH units	7.92	7.49	8.14	7.88	8.14	
solids, total suspended [TSS]	----	E160	3.0	mg/L	233	<3.0	8.3	<3.0	11.1	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0120	0.0055	<0.0050	0.0119	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	30.6	1.69	1.40	1.62	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	0.0054	<0.0010	<0.0010	0.0019	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	0.134 ^{DLHC}	0.0011	0.0080	0.0013	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.149 ^{DLHC}	0.0142	0.0101	0.0147	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	30.6	1.69	1.40	1.62	
Microbiological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	4	4	2	8	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	80.6	<2.0	----	----	----	
chemical oxygen demand [COD]	----	E559-L	10	mg/L	----	12	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2203658	Page	: 1 of 10
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC- SPRING WEEK1	Date Samples Received	: 31-Mar-2022 10:38
PO	: ----	Issue Date	: 06-Apr-2022 13:38
C-O-C number	: ----		
Sampler	: Kevin Mackey		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	30-Mar-2022	----	----	----		01-Apr-2022	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP INFLUENT	E550	30-Mar-2022	----	----	----		01-Apr-2022	3 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E559-L	30-Mar-2022	----	----	----		01-Apr-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E298	30-Mar-2022	31-Mar-2022	----	----		31-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E298	30-Mar-2022	31-Mar-2022	----	----		31-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E298	30-Mar-2022	31-Mar-2022	----	----		31-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	30-Mar-2022	31-Mar-2022	----	----		31-Mar-2022	28 days	1 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER @ OUTFALL	E378-U	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER DOWNSTREAM	E378-U	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER UPSTREAM	E378-U	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE WWTP EFFLUENT	E378-U	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER @ OUTFALL	E235.NO3-L	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO3-L	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO3-L	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO3-L	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER @ OUTFALL	E235.NO2-L	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO2-L	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO2-L	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO2-L	30-Mar-2022	----	----	----		31-Mar-2022	3 days	1 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E372-U	30-Mar-2022	05-Apr-2022	----	----		05-Apr-2022	28 days	6 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E372-U	30-Mar-2022	05-Apr-2022	----	----		05-Apr-2022	28 days	6 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E372-U	30-Mar-2022	05-Apr-2022	----	----		05-Apr-2022	28 days	6 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	30-Mar-2022	05-Apr-2022	----	----		05-Apr-2022	28 days	6 days	✔	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER @ OUTFALL	E012.FC	30-Mar-2022	----	----	----		31-Mar-2022	30 hrs	25 hrs	✔	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER DOWNSTREAM	E012.FC	30-Mar-2022	----	----	----		31-Mar-2022	30 hrs	25 hrs	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) ELK RIVER UPSTREAM	E012.FC	30-Mar-2022	----	----	----		31-Mar-2022	30 hrs	25 hrs	✓
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	30-Mar-2022	----	----	----		31-Mar-2022	30 hrs	26 hrs	✓
Physical Tests : pH by Meter										
HDPE ELK RIVER @ OUTFALL	E108	30-Mar-2022	----	----	----		01-Apr-2022	0.25 hrs	53 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE ELK RIVER DOWNSTREAM	E108	30-Mar-2022	----	----	----		01-Apr-2022	0.25 hrs	53 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE ELK RIVER UPSTREAM	E108	30-Mar-2022	----	----	----		01-Apr-2022	0.25 hrs	53 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE WWTP EFFLUENT	E108	30-Mar-2022	----	----	----		01-Apr-2022	0.25 hrs	53 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE WWTP INFLUENT	E108	30-Mar-2022	----	----	----		01-Apr-2022	0.25 hrs	53 hrs	* EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER @ OUTFALL	E160	30-Mar-2022	----	----	----		03-Apr-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER DOWNSTREAM	E160	30-Mar-2022	----	----	----		03-Apr-2022	7 days	4 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER UPSTREAM	E160	30-Mar-2022	----	----	----		03-Apr-2022	7 days	4 days	✔
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	30-Mar-2022	----	----	----		03-Apr-2022	7 days	4 days	✔
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	30-Mar-2022	----	----	----		03-Apr-2022	7 days	4 days	✔

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	447556	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	448433	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	447895	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	447428	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	447126	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	447125	1	20	5.0	5.0	✓
pH by Meter	E108	448369	1	15	6.6	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	448270	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	449619	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	449193	1	18	5.5	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	447556	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	448433	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	447895	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	447428	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	447126	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	447125	1	20	5.0	5.0	✓
pH by Meter	E108	448369	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	449619	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	449193	1	18	5.5	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	447556	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	448433	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	447895	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	447428	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	447126	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	447125	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	448270	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	449619	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	449193	1	18	5.5	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	447556	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	447895	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	447428	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	447126	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	447125	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	449619	1	20	5.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : CG2203658

Page : 1 of 6

Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC- SPRING WEEK1
PO : ----
C-O-C number : ----
Sampler : Kevin Mackey
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 31-Mar-2022 10:38
Date Analysis Commenced : 31-Mar-2022
Issue Date : 06-Apr-2022 13:38

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
Matrix Spike (MS) Report; Recovery and Acceptance Limits
Reference Material (RM) Report; Recovery and Acceptance Limits
Method Blank (MB) Report; Recovery and Acceptance Limits
Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Erin Sanchez, Katarzyna Glinka, Parker Sgarbossa, Ruifang Zheng, Sara Niroomand, and Sunil Palak.

Page : 2 of 6
Work Order : CG2203658
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC- SPRING WEEK1



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 448369)											
CG2203623-001	Anonymous	pH	----	E108	0.10	pH units	5.37	5.49	2.21%	4%	----
Physical Tests (QC Lot: 449193)											
FC2200584-003	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	87.3	89.3	2.26%	20%	----
Anions and Nutrients (QC Lot: 447125)											
CG2203661-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 447126)											
CG2203661-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.226	0.182	0.0438	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 447428)											
CG2203658-002	WWTP EFFLUENT	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0020	mg/L	0.134	0.133	1.16%	20%	----
Anions and Nutrients (QC Lot: 447556)											
CG2203646-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.200	0.197	1.36%	20%	----
Anions and Nutrients (QC Lot: 449619)											
CG2203649-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0042	0.0037	0.0004	Diff <2x LOR	----
Microbiological Tests (QC Lot: 448270)											
CG2203658-002	WWTP EFFLUENT	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	4	3	28.6%	65%	----
Aggregate Organics (QC Lot: 447895)											
CG2203647-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	26	27	0.2	Diff <2x LOR	----
Aggregate Organics (QC Lot: 448433)											
CG2203655-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 449193)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 447125)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 447126)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 447428)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 447556)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	MBRR
Anions and Nutrients (QCLot: 449619)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 448270)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 447895)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 448433)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----

Qualifiers

Qualifier	Description
MBRR	Initial MB for this submission had positive results for flagged analyte (data not shown). Low level samples were repeated with new QC (2nd MB results shown). High level results (>5x initial MB level) and non-detect results were reported and are defensible



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 448369)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 449193)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	98.1	85.0	115	----
Anions and Nutrients (QCLot: 447125)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 447126)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 447428)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	92.3	80.0	120	----
Anions and Nutrients (QCLot: 447556)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 449619)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	103	80.0	120	----
Aggregate Organics (QCLot: 447895)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	103	85.0	115	----
Aggregate Organics (QCLot: 448433)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	96.9	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 447125)										
CG2203661-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.544 mg/L	0.5 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 447126)										
CG2203661-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.58 mg/L	2.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 447428)										
CG2203659-003	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0476 mg/L	0.05 mg/L	95.2	70.0	130	----
Anions and Nutrients (QCLot: 447556)										
CG2203658-003	ELK RIVER UPSTREAM	ammonia, total (as N)	7664-41-7	E298	0.0998 mg/L	0.1 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 449619)										
CG2203654-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0594 mg/L	0.0676 mg/L	87.8	70.0	130	----
Aggregate Organics (QCLot: 447895)										
CG2203658-002	WWTP EFFLUENT	chemical oxygen demand [COD]	----	E559-L	102 mg/L	100 mg/L	102	75.0	125	----



Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 9595 - 111 Street, T6V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 Fax: 780-513-2191
 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

SEND REPORT TO:

CHAIN OF CUSTODY FORM

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:														
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST																		
CITY: CALGARY	PROV: ALBERTA	POSTAL CODE: T2T 0E2																
TEL: 403-256-8473	FAX: 403-244-3774	SAMPLER: Kevin Mackey																
PROJECT NAME AND NO.: FARUC - Winter EMS WEEK <u>Spring week 1</u>		QUOTE NO.:																
PO NO.:	ALS CONTACT: Patryk Wojciak																	
REPORT FORMAT:		<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com																
		<input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:																
WC#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD				
		YYYY-MM-DD	TIME															
FOR LAB USE ONLY	WWTP Influent Routine	2022-03-30	7:30	Water		X	X										9.0 °C	
	WWTP Influent BOD	2022-03-30		Water									X				11.3 °C	
	WWTP Effluent Routine	2022-03-30		Water		X	X							X				
	WWTP Effluent BOD	2022-03-30		Water										X				
	WWTP Effluent Nutrients	2022-03-30		Water				X	X	X	X	X						
	WWTP Effluent Bacteriological	2022-03-30		Water	X													
	Elk River Upstream Routine	2022-03-30	10:20	Water		X	X											3.7 °C
	Elk River Upstream Nutrients	2022-03-30		Water				X	X	X	X	X						
	Elk River Upstream Bacteriological	2022-03-30		Water	X													
	Elk River @ Outfall Routine	2022-03-30	10:10	Water		X	X											3.9 °C
	Elk River @ Outfall Nutrients	2022-03-30		Water				X	X	X	X	X						
	Elk River @ Outfall Bacteriological	2022-03-30		Water	X													
	Elk River Downstream Routine	2022-03-30	10:00	Water		X	X											3.5 °C
Elk River Downstream Nutrients	2022-03-30		Water				X	X	X	X	X							
Elk River Downstream Bacteriological	2022-03-30		Water	X														

Environmental Division
 Calgary
 Work Order Reference
CG2203658



Telephone : +1 403 407 1800

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY: Kevin Mackey	DATE: 2022-03-30	RECEIVED BY: <i>[Signature]</i>	DATE: 3/31
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)	TIME: 11:15		TIME: 9:20	
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
		TIME:		TIME:	

SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-261-4652 OR E-MAIL TO wastewater@skifernie.com		FOR LAB USE ONLY:	
Cooler Seal Intact?	Yes No N/A	Sample Temperature: 8 °C	Cooling Method?
		Frozen? Yes No	Icepacks Ice None



Environmental

CERTIFICATE OF ANALYSIS

Work Order : **CG2203883**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - SPRING EMS WEEK 2
PO : ----
C-O-C number : ----
Sampler : KM
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 06-Apr-2022 09:30
Date Analysis Commenced : 06-Apr-2022
Issue Date : 13-Apr-2022 15:10

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Erin Sanchez		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Workorder Comments

No sampling time provided, sampling time is assumed

Qualifiers

<i>Qualifier</i>	<i>Description</i>
BODP	BOD dilution results differed by more than 30% RPD. Precision of reported BOD result may be less than usual.
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.



Analytical Results

Sub-Matrix: Water					Client sample ID	WWTP INFLUENT	WWTP EFFLUENT	ELK RIVER UPSTREAM	ELK RIVER @ OUTFALL	ELK RIVER DOWNSTREAM
(Matrix: Water)					Client sampling date / time	05-Apr-2022 12:00	05-Apr-2022 12:00	05-Apr-2022 12:00	05-Apr-2022 12:00	05-Apr-2022 12:00
Analyte	CAS Number	Method	LOR	Unit	CG2203883-001	CG2203883-002	CG2203883-003	CG2203883-004	CG2203883-005	
					Result	Result	Result	Result	Result	
Physical Tests										
pH	----	E108	0.10	pH units	7.79	7.79	8.31	8.20	8.30	
solids, total suspended [TSS]	----	E160	3.0	mg/L	73.5	<3.0	<3.0	<3.0	<3.0	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0199	<0.0050	<0.0050	0.0095	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	28.0 ^{HTD}	2.24	2.12	2.14	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	0.0096	0.0027	<0.0010	0.0036	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	0.0665	<0.0010	0.0065	<0.0010	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.0780	0.0065	0.0123	0.0063	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	28.0	2.24	2.12	2.14	
Microbiological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	1	2	13	2	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	70.7 ^{BODP}	2.5 ^{BODP}	----	----	----	
chemical oxygen demand [COD]	----	E559-L	10	mg/L	----	<10	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2203883	Page	: 1 of 10
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - SPRING EMS WEEK 2	Date Samples Received	: 06-Apr-2022 09:30
PO	: ----	Issue Date	: 13-Apr-2022 15:10
C-O-C number	: ----		
Sampler	: KM		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	05-Apr-2022	----	----	----		07-Apr-2022	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP INFLUENT	E550	05-Apr-2022	----	----	----		07-Apr-2022	3 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E559-L	05-Apr-2022	----	----	----		06-Apr-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E298	05-Apr-2022	08-Apr-2022	----	----		08-Apr-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E298	05-Apr-2022	08-Apr-2022	----	----		08-Apr-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E298	05-Apr-2022	08-Apr-2022	----	----		08-Apr-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	05-Apr-2022	08-Apr-2022	----	----		08-Apr-2022	28 days	3 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER @ OUTFALL	E378-U	05-Apr-2022	----	----	----		06-Apr-2022	3 days	1 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER DOWNSTREAM	E378-U	05-Apr-2022	----	----	----		06-Apr-2022	3 days	1 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER UPSTREAM	E378-U	05-Apr-2022	----	----	----		06-Apr-2022	3 days	1 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE WWTP EFFLUENT	E378-U	05-Apr-2022	----	----	----		06-Apr-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER @ OUTFALL	E235.NO3-L	05-Apr-2022	----	----	----		07-Apr-2022	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO3-L	05-Apr-2022	----	----	----		07-Apr-2022	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO3-L	05-Apr-2022	----	----	----		07-Apr-2022	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO3-L	05-Apr-2022	----	----	----		11-Apr-2022	3 days	6 days	* EHT	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER @ OUTFALL	E235.NO2-L	05-Apr-2022	----	----	----		07-Apr-2022	3 days	2 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO2-L	05-Apr-2022	----	----	----		07-Apr-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO2-L	05-Apr-2022	----	----	----		07-Apr-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO2-L	05-Apr-2022	----	----	----		07-Apr-2022	3 days	2 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E372-U	05-Apr-2022	08-Apr-2022	----	----		08-Apr-2022	28 days	3 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E372-U	05-Apr-2022	08-Apr-2022	----	----		08-Apr-2022	28 days	3 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E372-U	05-Apr-2022	08-Apr-2022	----	----		08-Apr-2022	28 days	3 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	05-Apr-2022	08-Apr-2022	----	----		08-Apr-2022	28 days	3 days	✔	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER @ OUTFALL	E012.FC	05-Apr-2022	----	----	----		06-Apr-2022	30 hrs	23 hrs	✔	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER DOWNSTREAM	E012.FC	05-Apr-2022	----	----	----		06-Apr-2022	30 hrs	23 hrs	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER UPSTREAM	E012.FC	05-Apr-2022	----	----	----		06-Apr-2022	30 hrs	23 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	05-Apr-2022	----	----	----		06-Apr-2022	30 hrs	23 hrs	✓	
Physical Tests : pH by Meter											
HDPE ELK RIVER @ OUTFALL	E108	05-Apr-2022	----	----	----		08-Apr-2022	0.25 hrs	73 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER DOWNSTREAM	E108	05-Apr-2022	----	----	----		08-Apr-2022	0.25 hrs	73 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER UPSTREAM	E108	05-Apr-2022	----	----	----		08-Apr-2022	0.25 hrs	73 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP EFFLUENT	E108	05-Apr-2022	----	----	----		08-Apr-2022	0.25 hrs	73 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP INFLUENT	E108	05-Apr-2022	----	----	----		08-Apr-2022	0.25 hrs	73 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER @ OUTFALL	E160	05-Apr-2022	----	----	----		08-Apr-2022	7 days	3 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER DOWNSTREAM	E160	05-Apr-2022	----	----	----		08-Apr-2022	7 days	3 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER UPSTREAM	E160	05-Apr-2022	----	----	----		08-Apr-2022	7 days	3 days	✔
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	05-Apr-2022	----	----	----		08-Apr-2022	7 days	3 days	✔
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	05-Apr-2022	----	----	----		08-Apr-2022	7 days	3 days	✔

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 EHT: Exceeded ALS recommended hold time prior to analysis.
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	453730	1	13	7.6	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	453110	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	451587	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	451757	1	19	5.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	452397	1	19	5.2	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	452396	1	19	5.2	5.0	✔
pH by Meter	E108	453834	1	20	5.0	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	452944	1	19	5.2	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	452764	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	453086	1	20	5.0	5.0	✔
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	453730	1	13	7.6	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	453110	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	451587	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	451757	1	19	5.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	452397	1	19	5.2	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	452396	1	19	5.2	5.0	✔
pH by Meter	E108	453834	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	452764	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	453086	1	20	5.0	5.0	✔
Method Blanks (MB)							
Ammonia by Fluorescence	E298	453730	1	13	7.6	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	453110	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	451587	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	451757	1	19	5.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	452397	1	19	5.2	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	452396	1	19	5.2	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	452944	1	19	5.2	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	452764	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	453086	1	20	5.0	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	453730	1	13	7.6	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	451587	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	451757	1	19	5.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	452397	1	19	5.2	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	452396	1	19	5.2	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	452764	1	20	5.0	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
---------------------	--------------	--------	------------------	---------------------



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : **CG2203883**

Page : 1 of 6

Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - SPRING EMS WEEK 2
PO : ----
C-O-C number : ----
Sampler : KM
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 06-Apr-2022 09:30
Date Analysis Commenced : 06-Apr-2022
Issue Date : 13-Apr-2022 15:10

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	Position	Laboratory Department
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Erin Sanchez		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta

Page : 2 of 6
Work Order : CG2203883
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - SPRING EMS WEEK 2



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 453086)											
CG2203869-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	3.9	3.3	0.6	Diff <2x LOR	----
Physical Tests (QC Lot: 453834)											
CG2203883-001	WWTP INFLUENT	pH	----	E108	0.10	pH units	7.79	7.81	0.256%	4%	----
Anions and Nutrients (QC Lot: 451757)											
CG2203873-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0500	mg/L	2.45	2.45	0.0408%	20%	----
Anions and Nutrients (QC Lot: 452396)											
CG2203905-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0031	0.0020	0.0011	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 452397)											
CG2203905-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	2.15	2.14	0.573%	20%	----
Anions and Nutrients (QC Lot: 452764)											
CG2203860-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0229	0.0236	2.68%	20%	----
Anions and Nutrients (QC Lot: 453730)											
CG2203883-002	WWTP EFFLUENT	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0199	0.0199	0	Diff <2x LOR	----
Microbiological Tests (QC Lot: 452944)											
CG2203883-002	WWTP EFFLUENT	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	1	1	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 451587)											
CG2203873-007	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	163	166	1.76%	20%	----
Aggregate Organics (QC Lot: 453110)											
CG2203887-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 453086)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 451757)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 452396)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 452397)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 452764)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 453730)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Microbiological Tests (QCLot: 452944)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 451587)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 453110)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 453086)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	96.8	85.0	115	----
Physical Tests (QCLot: 453834)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Anions and Nutrients (QCLot: 451757)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	93.5	80.0	120	----
Anions and Nutrients (QCLot: 452396)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 452397)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 452764)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	94.8	80.0	120	----
Anions and Nutrients (QCLot: 453730)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.2	85.0	115	----
Aggregate Organics (QCLot: 451587)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	99.0	85.0	115	----
Aggregate Organics (QCLot: 453110)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	92.6	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 451757)										
CG2203873-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 452396)										
CG2203905-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.477 mg/L	0.5 mg/L	95.4	75.0	125	----
Anions and Nutrients (QCLot: 452397)										
CG2203905-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.36 mg/L	2.5 mg/L	94.3	75.0	125	----
Anions and Nutrients (QCLot: 452764)										
CG2203869-001	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.0676 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 453730)										
CG2203883-003	ELK RIVER UPSTREAM	ammonia, total (as N)	7664-41-7	E298	0.0991 mg/L	0.1 mg/L	99.1	75.0	125	----
Aggregate Organics (QCLot: 451587)										
CG2203873-008	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----



SEND REPORT TO:

CHAIN OF CUSTODY FORM

COMPANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN:	PATRICK MAJER	
ADDRESS:	1505 - 17TH AVENUE SOUTH WEST				
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Kevin Mackey
PROJECT NAME AND NO.:	FARUC - Spring EMS week 2		QUOTE NO.:		
PO NO.:		ALS CONTACT:	Ptryk Woyciak		
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:				

Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	Temp (°C)	
										Water	Air
	X	X									8.0
								X			11.5
	X	X							X		2.6
								X			2.5
			X	X	X	X	X				2.6
X											
	X	X									
			X	X	X	X	X				
X											
	X	X									
			X	X	X	X	X				
X											

Environmental Division
 Calgary
 Work Order Reference
CG2203883



Telephone : +1 403 407 1800

WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX
		YYYY-MM-DD	TIME	
	WWTP Influent Routine	2022-04-05		Water
	WWTP Influent BOD	2022-04-05		Water
	WWTP Effluent Routine	2022-04-05		Water
	WWTP Effluent BOD	2022-04-05		Water
	WWTP Effluent Nutrients	2022-04-05		Water
	WWTP Effluent Bacteriological	2022-04-05		Water
	Elk River Upstream Routine	2022-04-05		Water
	Elk River Upstream Nutrients	2022-04-05		Water
	Elk River Upstream Bacteriological	2022-04-05		Water
	Elk River @ Outfall Routine	2022-04-05		Water
	Elk River @ Outfall Nutrients	2022-04-05		Water
	Elk River @ Outfall Bacteriological	2022-04-05		Water
	Elk River Downstream Routine	2022-04-05		Water
	Elk River Downstream Nutrients	2022-04-05		Water
	Elk River Downstream Bacteriological	2022-04-05		Water

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX
SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com

RELINQUISHED BY:	DATE:	2022-04-05	RECEIVED BY:	DATE:	4/6
Kevin Mackey	TIME:	11:15	<i>RHL</i>	TIME:	9:30
RELINQUISHED BY:	DATE:		RECEIVED BY:	DATE:	
	TIME:			TIME:	

FOR LAB USE ONLY		
Cooler Seal Intact?	Sample Temperature: _____ °C	Cooling Method?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No	Icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None

FOR LAB USE ONLY

30



CERTIFICATE OF ANALYSIS

Work Order : **CG2204250**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - SPRING EMS WEEK 3
PO : ----
C-O-C number : ----
Sampler : Kevin Mackey
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 14-Apr-2022 08:40
Date Analysis Commenced : 14-Apr-2022
Issue Date : 20-Apr-2022 15:14

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Erin Sanchez		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Workorder Comments

No sampling time provided on COC; sampling time is assumed.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

Sub-Matrix: Water					Client sample ID	WWTP INFLUENT	WWTP EFFLUENT	ELK RIVER UPSTREAM	ELK RIVER OUTFALL	ELK RIVER DOWNSTREAM
(Matrix: Water)					Client sampling date / time	13-Apr-2022 12:00	13-Apr-2022 12:00	13-Apr-2022 12:00	13-Apr-2022 12:00	13-Apr-2022 12:00
Analyte	CAS Number	Method	LOR	Unit	CG2204250-001	CG2204250-002	CG2204250-003	CG2204250-004	CG2204250-005	
					Result	Result	Result	Result	Result	
Physical Tests										
pH	----	E108	0.10	pH units	7.92	7.99	8.34	8.29	8.34	
solids, total suspended [TSS]	----	E160	3.0	mg/L	47.5	<3.0	<3.0	7.5	3.1	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0051	<0.0050	<0.0050	<0.0050	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	24.1	2.69	0.517	2.60	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	0.0061	0.0046	<0.0010	0.0018	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	0.0918	<0.0010	0.0049	<0.0010	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.112 ^{DLHC}	0.0069	0.0200	0.0065	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	24.1	2.69	0.517	2.60	
Microbiological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	2	<1	<1	2	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	41.6	<2.0	----	----	----	
chemical oxygen demand [COD]	----	E559-L	10	mg/L	----	<10	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2204250	Page	: 1 of 10
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - SPRING EMS WEEK 3	Date Samples Received	: 14-Apr-2022 08:40
PO	: ----	Issue Date	: 20-Apr-2022 15:14
C-O-C number	: ----		
Sampler	: Kevin Mackey		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

- Anonymous:** Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP INFLUENT	E550	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E559-L	13-Apr-2022	----	----	----		14-Apr-2022	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E298	13-Apr-2022	14-Apr-2022	----	----		14-Apr-2022	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) ELK RIVER OUTFALL	E298	13-Apr-2022	14-Apr-2022	----	----		14-Apr-2022	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E298	13-Apr-2022	14-Apr-2022	----	----		14-Apr-2022	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	13-Apr-2022	14-Apr-2022	----	----		14-Apr-2022	28 days	1 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER DOWNSTREAM	E378-U	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER OUTFALL	E378-U	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER UPSTREAM	E378-U	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE WWTP EFFLUENT	E378-U	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO3-L	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER OUTFALL	E235.NO3-L	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO3-L	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO3-L	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO2-L	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER OUTFALL	E235.NO2-L	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO2-L	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO2-L	13-Apr-2022	----	----	----		14-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E372-U	13-Apr-2022	20-Apr-2022	----	----		20-Apr-2022	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER OUTFALL	E372-U	13-Apr-2022	20-Apr-2022	----	----		20-Apr-2022	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E372-U	13-Apr-2022	20-Apr-2022	----	----		20-Apr-2022	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	13-Apr-2022	20-Apr-2022	----	----		20-Apr-2022	28 days	7 days	✔	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER DOWNSTREAM	E012.FC	13-Apr-2022	----	----	----		14-Apr-2022	30 hrs	24 hrs	✔	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER OUTFALL	E012.FC	13-Apr-2022	----	----	----		14-Apr-2022	30 hrs	24 hrs	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER UPSTREAM	E012.FC	13-Apr-2022	----	----	----		14-Apr-2022	30 hrs	24 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	13-Apr-2022	----	----	----		14-Apr-2022	30 hrs	24 hrs	✓	
Physical Tests : pH by Meter											
HDPE ELK RIVER DOWNSTREAM	E108	13-Apr-2022	----	----	----		14-Apr-2022	0.25 hrs	24 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER OUTFALL	E108	13-Apr-2022	----	----	----		14-Apr-2022	0.25 hrs	24 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER UPSTREAM	E108	13-Apr-2022	----	----	----		14-Apr-2022	0.25 hrs	24 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP EFFLUENT	E108	13-Apr-2022	----	----	----		14-Apr-2022	0.25 hrs	24 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP INFLUENT	E108	13-Apr-2022	----	----	----		14-Apr-2022	0.25 hrs	24 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER DOWNSTREAM	E160	13-Apr-2022	----	----	----		19-Apr-2022	7 days	6 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER OUTFALL	E160	13-Apr-2022	----	----	----		19-Apr-2022	7 days	6 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER UPSTREAM	E160	13-Apr-2022	----	----	----		19-Apr-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	13-Apr-2022	----	----	----		19-Apr-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	13-Apr-2022	----	----	----		19-Apr-2022	7 days	6 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	459023	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	459057	1	16	6.2	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	458952	1	11	9.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	459173	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	459080	1	14	7.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	459081	1	13	7.6	5.0	✔
pH by Meter	E108	458806	1	20	5.0	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	460095	1	15	6.6	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	460162	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	461325	1	17	5.8	5.0	✔
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	459023	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	459057	1	16	6.2	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	458952	1	11	9.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	459173	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	459080	1	14	7.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	459081	1	13	7.6	5.0	✔
pH by Meter	E108	458806	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	460162	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	461325	1	17	5.8	5.0	✔
Method Blanks (MB)							
Ammonia by Fluorescence	E298	459023	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	459057	1	16	6.2	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	458952	1	11	9.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	459173	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	459080	1	14	7.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	459081	1	13	7.6	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	460095	1	15	6.6	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	460162	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	461325	1	17	5.8	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	459023	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	458952	1	11	9.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	459173	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	459080	1	14	7.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	459081	1	13	7.6	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	460162	1	20	5.0	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
---------------------	--------------	--------	------------------	---------------------



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : **CG2204250**

Page : 1 of 6

Client : Fernie Alpine Resort Utilities Corporation
 Contact : Patrick Majer
 Address : 1505 - 17TH AVENUE SW
 Calgary AB Canada T2T 0E2
 Telephone : 403 254 7669
 Project : FARUC - SPRING EMS WEEK 3
 PO : ----
 C-O-C number : ----
 Sampler : Kevin Mackey
 Site : ----
 Quote number : CG21-FARU100-0002
 No. of samples received : 5
 No. of samples analysed : 5

Laboratory : Calgary - Environmental
 Account Manager : Patryk Wojciak
 Address : 2559 29th Street NE
 Calgary, Alberta Canada T1Y 7B5
 Telephone : +1 403 407 1800
 Date Samples Received : 14-Apr-2022 08:40
 Date Analysis Commenced : 14-Apr-2022
 Issue Date : 20-Apr-2022 15:14

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Erin Sanchez		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta

Page : 2 of 6
Work Order : CG2204250
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - SPRING EMS WEEK 3



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 458806)											
CG2204227-003	Anonymous	pH	----	E108	0.10	pH units	7.95	8.00	0.627%	4%	----
Physical Tests (QC Lot: 461325)											
FC2200692-003	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	66.3	66.9	0.901%	20%	----
Anions and Nutrients (QC Lot: 459023)											
CG2204250-002	WWTP EFFLUENT	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0051	0.0050	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 459080)											
CG2204232-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0364	0.0353	0.0011	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 459081)											
CG2204232-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 459173)											
CG2204232-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0252	0.0268	6.32%	20%	----
Anions and Nutrients (QC Lot: 460162)											
CG2204250-002	WWTP EFFLUENT	phosphorus, total	7723-14-0	E372-U	0.0040	mg/L	0.112	0.108	2.94%	20%	----
Microbiological Tests (QC Lot: 460095)											
GP2200654-001	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	100	CFU/100mL	7200	9100	23.3%	65%	----
Aggregate Organics (QC Lot: 458952)											
CG2204225-005	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 459057)											
CG2204225-010	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 461325)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 459023)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 459080)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 459081)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 459173)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 460162)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 460095)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 458952)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 459057)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 458806)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 461325)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	95.4	85.0	115	----
Anions and Nutrients (QCLot: 459023)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	92.0	85.0	115	----
Anions and Nutrients (QCLot: 459080)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 459081)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	96.9	90.0	110	----
Anions and Nutrients (QCLot: 459173)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	100	80.0	120	----
Anions and Nutrients (QCLot: 460162)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	106	80.0	120	----
Aggregate Organics (QCLot: 458952)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	104	85.0	115	----
Aggregate Organics (QCLot: 459057)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	104	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 459023)										
CG2204250-003	ELK RIVER UPSTREAM	ammonia, total (as N)	7664-41-7	E298	0.0950 mg/L	0.1 mg/L	95.0	75.0	125	----
Anions and Nutrients (QCLot: 459080)										
CG2204260-013	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.46 mg/L	2.5 mg/L	98.3	75.0	125	----
Anions and Nutrients (QCLot: 459081)										
CG2204260-013	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.486 mg/L	0.5 mg/L	97.1	75.0	125	----
Anions and Nutrients (QCLot: 459173)										
CG2204232-003	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0461 mg/L	0.05 mg/L	92.2	70.0	130	----
Anions and Nutrients (QCLot: 460162)										
CG2204250-003	ELK RIVER UPSTREAM	phosphorus, total	7723-14-0	E372-U	0.0524 mg/L	0.0676 mg/L	77.5	70.0	130	----
Aggregate Organics (QCLot: 458952)										
CG2204225-007	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----



Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9876 Fax: 780-513-2191
 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9876 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9876
 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-688-8370 Toll Free: 1-800-667-7645

CHAIN OF CUSTODY FORM

SEND REPORT TO:

COMPANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION			ATTN:	PATRICK MAJER
ADDRESS:	1505 - 17TH AVENUE SOUTH WEST				
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Kevin Mackey
PROJECT NAME AND NO.:	FARUC - Spring EMS week 3			QUOTE NO.:	
PO NO.:		ALS CONTACT:	Patryk Woyciak		
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:				

Environmental Division
 Calgary
 Work Order Reference
CG2204250



Telephone : +1 403 407 1800

Environmental Division
 Calgary
 Work Order Reference
CG2204250

WC#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	PH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME												
	WWTP Influent Routine	2022-04-13		Water		X	X								8cc
	WWTP Influent BOD	2022-04-13		Water									X		
	WWTP Effluent Routine	2022-04-13		Water		X	X							X	12°C
	WWTP Effluent BOD	2022-04-13		Water									X		
	WWTP Effluent Nutrients	2022-04-13		Water				X	X	X	X	X			
	WWTP Effluent Bacteriological	2022-04-13		Water	X										
	Elk River Upstream Routine	2022-04-13		Water		X	X								1.1°C
	Elk River Upstream Nutrients	2022-04-13		Water				X	X	X	X	X			
	Elk River Upstream Bacteriological	2022-04-13		Water	X										
	Elk River @ Outfall Routine	2022-04-13		Water		X	X								6.8°C
	Elk River @ Outfall Nutrients	2022-04-13		Water				X	X	X	X	X			
	Elk River @ Outfall Bacteriological	2022-04-13		Water	X										
	Elk River Downstream Routine	2022-04-13		Water		X	X								0.5°C
	Elk River Downstream Nutrients	2022-04-13		Water				X	X	X	X	X			
	Elk River Downstream Bacteriological	2022-04-13		Water	X										

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	DATE:	2022-04-13	RECEIVED BY:	DATE:	4/14/22
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT. (provide details)	Carter Barrett	TIME:	11:15	<i>[Signature]</i>	TIME:	8:40
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	RELINQUISHED BY:	DATE:		RECEIVED BY:	DATE:	
SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com	FOR LAB USE ONLY	TIME:		TIME:		
		Cooler Seal Intact?	Sample Temperature: <u>3</u> °C		Cooling Method?		
		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No		Icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None		



COLIFORM SAMPLE DECLARATION FORM (Page 2 of 2)

C. Please complete this section ONLY if samples are Drinking Water Sample(s).

Company, Water System Name or Name of Home Owner: FERNIE ALPINE RESORT UTILITIES CORP.			
Address: 1505-17th AVE SW CALGARY	Phone No: (403) 256 8473	Fax No: (403) 244 3774	After Hours/Emergency No: (403) 861 8730
Water Supplier ² : PATRICK MAJER	Phone No: (403) 256 8473	Fax No: (403) 244 3774	After Hours/Emergency No: (403) 861 8730
Sampler/Submitter ³ : Coker Burnett	Phone No: (306) 861-7001	Fax No: ()	

² Person to whom results should be sent.

³ Sampler or submitter of samples if different than Water Supplier.

D. Please complete this section ONLY if samples are subject to regulation under the Drinking Water Protection Act.

Health Authority Region and/or Service Area ⁴ : INTERIOR HEALTH			
Drinking Water Officer Name: DAU BYRON	Phone No: (250) 420 2240	Fax No: ()	After Hours/Emergency No: (250) 421 3471
Medical Health Officer Name:	Phone No: ()	Fax No: ()	After Hours/Emergency No: (1866) 457 5648

⁴ There are five B.C. Health Authority Regions and 16 associated Health Service Delivery Areas:

- 1. Northern: Northwest, Northeast and Northern Interior
- 2. Interior: East Kootenay, Kootenay/Boundary, Okanagan and Thompson/Cariboo
- 3. Vancouver Island: North Vancouver Island, Central Vancouver Island and South Vancouver Island
- 4. Vancouver Coastal: North Shore / Coast Garibaldi, Vancouver and Richmond
- 5. Fraser: Fraser North, Fraser South and Fraser East

E. This section for lab use only.

Received By:	Date:	Time:	AM PM
Sample Temperature Upon Receipt:	COOLING METHOD: ICEPACKS <input type="checkbox"/> ICE <input type="checkbox"/> NONE <input type="checkbox"/>		

CERTIFICATE OF ANALYSIS

Work Order : **CG2204529**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
 Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - SPRING EMS WEEK 4
PO : ----
C-O-C number : ----
Sampler : Kevin Mackey
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
 Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 21-Apr-2022 09:30
Date Analysis Commenced : 21-Apr-2022
Issue Date : 27-Apr-2022 13:03

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Erin Sanchez		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).



Analytical Results

Sub-Matrix: Water					Client sample ID	WWTP INFLUENT	WWTP EFFLUENT	KLE RIVER UPSTREAM	ELK RIVER OUTFALL	ELK RIVER DOWNSTREAM
(Matrix: Water)					Client sampling date / time	20-Apr-2022 09:00	20-Apr-2022 09:10	20-Apr-2022 09:45	20-Apr-2022 10:00	20-Apr-2022 10:15
Analyte	CAS Number	Method	LOR	Unit	CG2204529-001	CG2204529-002	CG2204529-003	CG2204529-004	CG2204529-005	
					Result	Result	Result	Result	Result	
Physical Tests										
pH	----	E108	0.10	pH units	7.72	7.41	7.97	7.64	7.96	
solids, total suspended [TSS]	----	E160	3.0	mg/L	51.3	<3.0	4.7	<3.0	3.1	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0065	<0.0050	<0.0050	<0.0050	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	24.2	2.78	5.33	2.75	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	0.0085	0.0027	<0.0010	0.0039	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	0.123 ^{DLHC}	<0.0010	0.0685	<0.0010	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.134 ^{DLHC}	0.0063	0.0668 ^{DLM}	0.0054	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	24.2	2.78	5.33	2.75	
Microbiological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	<1	3	3	<1	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	39.0	<2.0	----	----	----	
chemical oxygen demand [COD]	----	E559-L	10	mg/L	----	<10	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2204529	Page	: 1 of 10
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - SPRING EMS WEEK 4	Date Samples Received	: 21-Apr-2022 09:30
PO	: ----	Issue Date	: 27-Apr-2022 13:03
C-O-C number	: ----		
Sampler	: Kevin Mackey		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

- Anonymous:** Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	20-Apr-2022	----	----	----		22-Apr-2022	3 days	2 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP INFLUENT	E550	20-Apr-2022	----	----	----		22-Apr-2022	3 days	2 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E559-L	20-Apr-2022	----	----	----		21-Apr-2022	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E298	20-Apr-2022	21-Apr-2022	----	----		21-Apr-2022	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) ELK RIVER OUTFALL	E298	20-Apr-2022	21-Apr-2022	----	----		21-Apr-2022	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) KLE RIVER UPSTREAM	E298	20-Apr-2022	21-Apr-2022	----	----		21-Apr-2022	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	20-Apr-2022	21-Apr-2022	----	----		21-Apr-2022	28 days	1 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER DOWNSTREAM	E378-U	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER OUTFALL	E378-U	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE KLE RIVER UPSTREAM	E378-U	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE WWTP EFFLUENT	E378-U	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO3-L	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER OUTFALL	E235.NO3-L	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE KLE RIVER UPSTREAM	E235.NO3-L	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO3-L	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO2-L	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER OUTFALL	E235.NO2-L	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE KLE RIVER UPSTREAM	E235.NO2-L	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO2-L	20-Apr-2022	----	----	----		21-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E372-U	20-Apr-2022	26-Apr-2022	----	----		26-Apr-2022	28 days	6 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) ELK RIVER OUTFALL	E372-U	20-Apr-2022	26-Apr-2022	----	----		26-Apr-2022	28 days	6 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) KLE RIVER UPSTREAM	E372-U	20-Apr-2022	26-Apr-2022	----	----		26-Apr-2022	28 days	6 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	20-Apr-2022	26-Apr-2022	----	----		26-Apr-2022	28 days	6 days	✔	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER DOWNSTREAM	E012.FC	20-Apr-2022	----	----	----		21-Apr-2022	30 hrs	24 hrs	✔	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER OUTFALL	E012.FC	20-Apr-2022	----	----	----		21-Apr-2022	30 hrs	25 hrs	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) KLE RIVER UPSTREAM	E012.FC	20-Apr-2022	----	----	----		21-Apr-2022	30 hrs	25 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	20-Apr-2022	----	----	----		21-Apr-2022	30 hrs	25 hrs	✓	
Physical Tests : pH by Meter											
HDPE ELK RIVER DOWNSTREAM	E108	20-Apr-2022	----	----	----		21-Apr-2022	0.25 hrs	31 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER OUTFALL	E108	20-Apr-2022	----	----	----		21-Apr-2022	0.25 hrs	31 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE KLE RIVER UPSTREAM	E108	20-Apr-2022	----	----	----		21-Apr-2022	0.25 hrs	31 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP EFFLUENT	E108	20-Apr-2022	----	----	----		21-Apr-2022	0.25 hrs	32 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP INFLUENT	E108	20-Apr-2022	----	----	----		21-Apr-2022	0.25 hrs	32 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER DOWNSTREAM	E160	20-Apr-2022	----	----	----		23-Apr-2022	7 days	3 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER OUTFALL	E160	20-Apr-2022	----	----	----		23-Apr-2022	7 days	3 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE KLE RIVER UPSTREAM	E160	20-Apr-2022	----	----	----		23-Apr-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	20-Apr-2022	----	----	----		23-Apr-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	20-Apr-2022	----	----	----		23-Apr-2022	7 days	3 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	464299	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	465748	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	464375	1	4	25.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	464282	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	464182	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	464183	1	17	5.8	5.0	✓
pH by Meter	E108	464828	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	465589	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	466038	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	465397	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	464299	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	465748	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	464375	1	4	25.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	464282	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	464182	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	464183	1	17	5.8	5.0	✓
pH by Meter	E108	464828	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	466038	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	465397	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	464299	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	465748	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	464375	1	4	25.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	464282	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	464182	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	464183	1	17	5.8	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	465589	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	466038	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	465397	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	464299	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	464375	1	4	25.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	464282	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	464182	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	464183	1	17	5.8	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	466038	1	20	5.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
---------------------	--------------	--------	------------------	---------------------



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : **CG2204529**

Page : 1 of 6

Client : Fernie Alpine Resort Utilities Corporation
 Contact : Patrick Majer
 Address : 1505 - 17TH AVENUE SW
 Calgary AB Canada T2T 0E2
 Telephone : 403 254 7669
 Project : FARUC - SPRING EMS WEEK 4
 PO : ----
 C-O-C number : ----
 Sampler : Kevin Mackey
 Site : ----
 Quote number : CG21-FARU100-0002
 No. of samples received : 5
 No. of samples analysed : 5

Laboratory : Calgary - Environmental
 Account Manager : Patryk Wojciak
 Address : 2559 29th Street NE
 Calgary, Alberta Canada T1Y 7B5
 Telephone : +1 403 407 1800
 Date Samples Received : 21-Apr-2022 09:30
 Date Analysis Commenced : 21-Apr-2022
 Issue Date : 27-Apr-2022 13:03

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	Position	Laboratory Department
Erin Sanchez		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta

Page : 2 of 6
Work Order : CG2204529
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - SPRING EMS WEEK 4



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 464828)											
CG2204529-001	WWTP INFLUENT	pH	----	E108	0.10	pH units	7.72	7.66	0.780%	4%	----
Physical Tests (QC Lot: 465397)											
CG2204492-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	20.7	22.5	1.8	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 464182)											
CG2204527-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.0521	0.0509	0.0012	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 464183)											
CG2204527-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 464282)											
CG2204521-003	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0200	mg/L	1.43	1.46	1.80%	20%	----
Anions and Nutrients (QC Lot: 464299)											
CG2204515-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 466038)											
CG2204524-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0100	mg/L	0.386	0.387	0.316%	20%	----
Microbiological Tests (QC Lot: 465589)											
CG2204529-002	WWTP EFFLUENT	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 464375)											
CG2204529-002	WWTP EFFLUENT	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 465748)											
CG2204527-002	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 465397)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 464182)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 464183)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 464282)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 464299)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 466038)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 465589)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 464375)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 465748)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 464828)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 465397)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	97.8	85.0	115	----
Anions and Nutrients (QCLot: 464182)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 464183)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 464282)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	99.8	80.0	120	----
Anions and Nutrients (QCLot: 464299)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	94.0	85.0	115	----
Anions and Nutrients (QCLot: 466038)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	96.4	80.0	120	----
Aggregate Organics (QCLot: 464375)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	90.2	85.0	115	----
Aggregate Organics (QCLot: 465748)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	96.3	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 464182)										
CG2204530-003	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.59 mg/L	2.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 464183)										
CG2204530-003	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.526 mg/L	0.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 464282)										
CG2204521-004	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 464299)										
CG2204515-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0990 mg/L	0.1 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 466038)										
CG2204529-002	WWTP EFFLUENT	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.0676 mg/L	ND	70.0	130	----
Aggregate Organics (QCLot: 464375)										
CG2204544-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	96 mg/L	100 mg/L	95.8	75.0	125	----



Vancouver BC, 1989 Triumph Street, V5L 1K5. Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 Fax: 780-513-2191
 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 Saskatoon SK, 819 - 56th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

CHAIN OF CUSTODY FORM

PAGE OF

SEND REPORT TO:

COMPANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN:	PATRICK MAJER	ANALYSIS REQUESTED:	
ADDRESS:	1505 - 17TH AVENUE SOUTH WEST					
CITY:	CALGARY	PRCV:	ALBERTA	POSTAL CODE:	T2T 0E2	
TEL:	403 - 258 - 8473	FAX:	403 - 214 - 3774	SAMPLER:	Kevin Mackey	
PROJECT NAME AND NO.:	FARUC - Spring EMS week 4		QUOTE NO.:			
PO NO.:		ALS CONTACT:	Petryk Wojciak			
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:					

Environmental Division
 Calgary
 Work Order Reference
CG2204529



Telephone : +1 403 407 1800

WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD					
		YYYY-MM-DD	TIME																
			WWTP Influent Routine																2022-04-20
	WWTP Influent BOD	2022-04-20	9:00	Water									X						
	WWTP Effluent Routine	2022-04-20	9:10	Water		X	X							X					
	WWTP Effluent BOD	2022-04-20	9:10	Water									X						10.2°C
	WWTP Effluent Nutrients	2022-04-20	9:10	Water				X	X	X	X	X							
	WWTP Effluent Bacteriological	2022-04-20	9:10	Water	X														
	Elk River Upstream Routine	2022-04-20	9:39:45	Water		X	X												3.7°C
	Elk River Upstream Nutrients	2022-04-20	9:45	Water				X	X	X	X	X							
	Elk River Upstream Bacteriological	2022-04-20	9:45	Water	X														
	Elk River @ Outfall Routine	2022-04-20	10:00	Water		X	X												5.2°C
	Elk River @ Outfall Nutrients	2022-04-20	10:00	Water				X	X	X	X	X							
	Elk River @ Outfall Bacteriological	2022-04-20	10:00	Water	X														
	Elk River Downstream Routine	2022-04-20	10:15	Water		X	X												3.8°C
	Elk River Downstream Nutrients	2022-04-20	10:15	Water				X	X	X	X	X							
	Elk River Downstream Bacteriological	2022-04-20	10:15	Water	X														

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	Carter Barrett	DATE:	2022-04-20	RECEIVED BY:	[Signature]	DATE:	4/21
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)	TIME:	11:15	TIME:		DATE:	9:30	DATE:	
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:	

SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com	FOR LAB USE ONLY
		Cooler Seal Intact? Yes ___ No ___ N/A
		Sample Temperature: 4 °C
		Frozen? Yes ___ No ___
		Cooling Method? Icepacks ___ Ice ___ None ___



Environmental

CERTIFICATE OF ANALYSIS

Work Order : **CG2204903**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - SPRING EMS WEEK 5
PO : ----
C-O-C number : ----
Sampler : KM
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 28-Apr-2022 09:40
Date Analysis Commenced : 28-Apr-2022
Issue Date : 04-May-2022 16:07

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

Sub-Matrix: Water					Client sample ID	WWTP INFLUENT	WWTP EFFLUENT	ELK RIVER UPSTREAM	ELK RIVER OUTFALL	ELK RIVER DOWNSTREAM
(Matrix: Water)					Client sampling date / time	27-Apr-2022	27-Apr-2022	27-Apr-2022	27-Apr-2022	27-Apr-2022
Analyte	CAS Number	Method	LOR	Unit	CG2204903-001	CG2204903-002	CG2204903-003	CG2204903-004	CG2204903-005	
					Result	Result	Result	Result	Result	
Physical Tests										
pH	----	E108	0.10	pH units	8.00	8.09	8.31	8.22	8.30	
solids, total suspended [TSS]	----	E160	3.0	mg/L	50.5	<3.0	10.3	4.5	9.9	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0072	<0.0050	<0.0050	<0.0050	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	22.2	2.35	0.731	2.23	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	0.0122	0.0025	0.0013	0.0017	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	0.186	0.0019	0.0151	0.0022	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.187 ^{DLHC}	0.0154	0.0226	0.0149	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	22.2	2.35	0.732	2.23	
Microbiological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	<1	6	1	<1	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	38.9	<2.0	----	----	----	
chemical oxygen demand [COD]	----	E559-L	10	mg/L	----	<10	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2204903	Page	: 1 of 10
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - SPRING EMS WEEK 5	Date Samples Received	: 28-Apr-2022 09:40
PO	: ----	Issue Date	: 04-May-2022 16:07
C-O-C number	: ----		
Sampler	: KM		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

- Anonymous:** Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	27-Apr-2022	----	----	----		29-Apr-2022	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP INFLUENT	E550	27-Apr-2022	----	----	----		29-Apr-2022	3 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E559-L	27-Apr-2022	----	----	----		28-Apr-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E298	27-Apr-2022	29-Apr-2022	----	----		29-Apr-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER OUTFALL	E298	27-Apr-2022	29-Apr-2022	----	----		29-Apr-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E298	27-Apr-2022	29-Apr-2022	----	----		29-Apr-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	27-Apr-2022	29-Apr-2022	----	----		29-Apr-2022	28 days	2 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER DOWNSTREAM	E378-U	27-Apr-2022	----	----	----		28-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER OUTFALL	E378-U	27-Apr-2022	----	----	----		28-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE ELK RIVER UPSTREAM	E378-U	27-Apr-2022	----	----	----		28-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE WWTP EFFLUENT	E378-U	27-Apr-2022	----	----	----		28-Apr-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO3-L	27-Apr-2022	----	----	----		29-Apr-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER OUTFALL	E235.NO3-L	27-Apr-2022	----	----	----		29-Apr-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO3-L	27-Apr-2022	----	----	----		29-Apr-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO3-L	27-Apr-2022	----	----	----		29-Apr-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO2-L	27-Apr-2022	----	----	----		29-Apr-2022	3 days	2 days	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER OUTFALL	E235.NO2-L	27-Apr-2022	----	----	----		29-Apr-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO2-L	27-Apr-2022	----	----	----		29-Apr-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO2-L	27-Apr-2022	----	----	----		29-Apr-2022	3 days	2 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E372-U	27-Apr-2022	04-May-2022	----	----		04-May-2022	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER OUTFALL	E372-U	27-Apr-2022	04-May-2022	----	----		04-May-2022	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E372-U	27-Apr-2022	04-May-2022	----	----		04-May-2022	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	27-Apr-2022	04-May-2022	----	----		04-May-2022	28 days	7 days	✔	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER DOWNSTREAM	E012.FC	27-Apr-2022	----	----	----		28-Apr-2022	30 hrs	21 hrs	✔	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER OUTFALL	E012.FC	27-Apr-2022	----	----	----		28-Apr-2022	30 hrs	21 hrs	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER UPSTREAM	E012.FC	27-Apr-2022	----	----	----		28-Apr-2022	30 hrs	21 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	27-Apr-2022	----	----	----		28-Apr-2022	30 hrs	21 hrs	✓	
Physical Tests : pH by Meter											
HDPE ELK RIVER DOWNSTREAM	E108	27-Apr-2022	----	----	----		28-Apr-2022	0.25 hrs	28 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER OUTFALL	E108	27-Apr-2022	----	----	----		28-Apr-2022	0.25 hrs	28 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER UPSTREAM	E108	27-Apr-2022	----	----	----		28-Apr-2022	0.25 hrs	28 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP EFFLUENT	E108	27-Apr-2022	----	----	----		28-Apr-2022	0.25 hrs	28 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP INFLUENT	E108	27-Apr-2022	----	----	----		28-Apr-2022	0.25 hrs	28 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER DOWNSTREAM	E160	27-Apr-2022	----	----	----		02-May-2022	7 days	5 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER OUTFALL	E160	27-Apr-2022	----	----	----		02-May-2022	7 days	5 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER UPSTREAM	E160	27-Apr-2022	----	----	----		02-May-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	27-Apr-2022	----	----	----		02-May-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	27-Apr-2022	----	----	----		02-May-2022	7 days	5 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	472473	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	472452	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	471572	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	471316	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	471918	1	5	20.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	471917	1	5	20.0	5.0	✓
pH by Meter	E108	471603	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	472373	1	17	5.8	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	472974	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	472743	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	472473	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	472452	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	471572	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	471316	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	471918	1	5	20.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	471917	1	5	20.0	5.0	✓
pH by Meter	E108	471603	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	472974	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	472743	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	472473	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	472452	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	471572	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	471316	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	471918	1	5	20.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	471917	1	5	20.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	472373	1	17	5.8	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	472974	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	472743	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	472473	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	471572	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	471316	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	471918	1	5	20.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	471917	1	5	20.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	472974	1	20	5.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
---------------------	--------------	--------	------------------	---------------------



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : CG2204903

Page : 1 of 6

Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - SPRING EMS WEEK 5
PO : ----
C-O-C number : ----
Sampler : KM
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 28-Apr-2022 09:40
Date Analysis Commenced : 28-Apr-2022
Issue Date : 04-May-2022 16:07

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
Matrix Spike (MS) Report; Recovery and Acceptance Limits
Reference Material (RM) Report; Recovery and Acceptance Limits
Method Blank (MB) Report; Recovery and Acceptance Limits
Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Parker Sgarbossa, Ruifang Zheng, Sara Niroomand, and Sunil Palak.

Page : 2 of 6
Work Order : CG2204903
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - SPRING EMS WEEK 5



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 471603)											
CG2204793-001	Anonymous	pH	----	E108	0.10	pH units	8.20	8.21	0.122%	4%	----
Physical Tests (QC Lot: 472743)											
CG2204813-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	18.3	17.3	1.0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 471316)											
CG2204847-008	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 471917)											
FJ2201005-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 471918)											
FJ2201005-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 472473)											
CG2204903-002	WWTP EFFLUENT	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0072	0.0076	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 472974)											
CG2204896-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0054	0.0052	0.0002	Diff <2x LOR	----
Microbiological Tests (QC Lot: 472373)											
FJ2201006-002	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	10000	CFU/100mL	1120000	1080000	3.64%	65%	----
Aggregate Organics (QC Lot: 471572)											
CG2204847-008	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 472452)											
CG2204906-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 472743)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 471316)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 471917)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 471918)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 472473)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 472974)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 472373)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 471572)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 472452)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 471603)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 472743)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	96.1	85.0	115	----
Anions and Nutrients (QCLot: 471316)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	108	80.0	120	----
Anions and Nutrients (QCLot: 471917)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	107	90.0	110	----
Anions and Nutrients (QCLot: 471918)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	108	90.0	110	----
Anions and Nutrients (QCLot: 472473)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 472974)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	104	80.0	120	----
Aggregate Organics (QCLot: 471572)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	99.8	85.0	115	----
Aggregate Organics (QCLot: 472452)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	93.1	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 471316)										
CG2204847-009	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0498 mg/L	0.05 mg/L	99.5	70.0	130	----
Anions and Nutrients (QCLot: 471917)										
FJ2201005-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.509 mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 471918)										
FJ2201005-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.49 mg/L	2.5 mg/L	99.5	75.0	125	----
Anions and Nutrients (QCLot: 472473)										
CG2204903-003	ELK RIVER UPSTREAM	ammonia, total (as N)	7664-41-7	E298	0.102 mg/L	0.1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 472974)										
CG2204896-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0684 mg/L	0.0676 mg/L	101	70.0	130	----
Aggregate Organics (QCLot: 471572)										
CG2204847-009	Anonymous	chemical oxygen demand [COD]	----	E559-L	99 mg/L	100 mg/L	99.4	75.0	125	----



CHAIN OF CUSTODY

SEND REPORT TO:

COMPANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION			ATTN:	PATRICK MAJER	ANAL:
ADDRESS:	1505 - 17TH AVENUE SOUTH WEST					
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2	
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Kevin Mackey	
PROJECT NAME AND NO.:	FARUC - Spring EMS week 5			QUOTE NO.:		
PO NO.:		ALS CONTACT:	Ptryk Woyciak			
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:					

Environmental Division
 Calgary
 Work Order Reference
CG2204903



Telephone : 1 403 407 1800

PAGE

Environmental Division
 Calgary
 Work Order Reference
CG2204903

WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	TESTS										NOTES (sample specific comments, due dates, etc.)		
		YYYY-MM-DD	TIME				1	2	3	4	5	6	7	8	9	10			
	WWTP Influent Routine	2022-04-27		Water		X	X											7.4°C	
	WWTP Influent BOD	2022-04-27		Water											X			1	
	WWTP Effluent Routine	2022-04-27		Water		X	X									X			10.4°C
	WWTP Effluent BOD	2022-04-27		Water											X				
	WWTP Effluent Nutrients	2022-04-27		Water				X	X	X	X	X	X						
	WWTP Effluent Bacteriological	2022-04-27		Water	X														
	Elk River Upstream Routine	2022-04-27		Water		X	X											4.7°C	
	Elk River Upstream Nutrients	2022-04-27		Water				X	X	X	X	X	X						
	Elk River Upstream Bacteriological	2022-04-27		Water	X														
	Elk River @ Outfall Routine	2022-04-27		Water		X	X											4.6°C	
	Elk River @ Outfall Nutrients	2022-04-27		Water				X	X	X	X	X	X						
	Elk River @ Outfall Bacteriological	2022-04-27		Water	X														
	Elk River Downstream Routine	2022-04-27		Water		X	X											4.9°C	
	Elk River Downstream Nutrients	2022-04-27		Water				X	X	X	X	X	X						
	Elk River Downstream Bacteriological	2022-04-27		Water	X														

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	DATE:	2022/04/27	RECEIVED BY:	DATE:	4/28
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)	Carter Barrett	TIME:	11:15	<i>npl</i>	TIME:	11:16
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	RELINQUISHED BY:	DATE:		RECEIVED BY:	DATE:	
SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com	TIME:			TIME:		
FOR LAB USE ONLY		Cooler Seal Intact?	Sample Temperature:	6 °C	Cooling Method?		
		Yes ___ No ___ N/A	Frozen?	Yes ___ No ___	Icepacks	Ice ___ None	

FOR LAB USE ONLY



CERTIFICATE OF ANALYSIS

Work Order : **CG2205283**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - SPRING EMS WEEK 6
PO : ----
C-O-C number : ----
Sampler : Kevin Mackey
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 05-May-2022 10:20
Date Analysis Commenced : 05-May-2022
Issue Date : 12-May-2022 15:28

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Workorder Comments

Bacteria samples are expired prior to receipt at ALS Calgary

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

Sub-Matrix: Water					Client sample ID	WWTP INFLUENT	WWTP EFFLUENT	ELK RIVER UPSTREAM	ELK RIVER OUTFALL	ELK RIVER DOWNSTREAM
(Matrix: Water)					Client sampling date / time	03-May-2022 11:30	03-May-2022 10:30	03-May-2022 09:50	03-May-2022 09:40	03-May-2022 09:30
Analyte	CAS Number	Method	LOR	Unit	CG2205283-001	CG2205283-002	CG2205283-003	CG2205283-004	CG2205283-005	
					Result	Result	Result	Result	Result	
Physical Tests										
pH	----	E108	0.10	pH units	8.24	8.21	8.42	8.38	8.43	
solids, total suspended [TSS]	----	E160	3.0	mg/L	52.9	<3.0	16.1	4.9	12.5	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0103	<0.0050	0.0076	<0.0050	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	21.2	2.14	1.60	2.06	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	0.0088	0.0017	0.0014	0.0014	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	0.235 ^{DLHC}	0.0019	0.0130	0.0024	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.244 ^{DLHC}	0.0207	0.0200	0.0205	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	21.2	2.14	1.60	2.06	
Microbiological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	<1	3	<1	2	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	46.7	<2.0	----	----	----	
chemical oxygen demand [COD]	----	E559-L	10	mg/L	----	11	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2205283	Page	: 1 of 10
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - SPRING EMS WEEK 6	Date Samples Received	: 05-May-2022 10:20
PO	: ----	Issue Date	: 12-May-2022 15:28
C-O-C number	: ----		
Sampler	: Kevin Mackey		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	03-May-2022	----	----	----		06-May-2022	3 days	3 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP INFLUENT	E550	03-May-2022	----	----	----		06-May-2022	3 days	3 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E559-L	03-May-2022	----	----	----		05-May-2022	28 days	2 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E298	03-May-2022	05-May-2022	----	----		05-May-2022	28 days	2 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) ELK RIVER OUTFALL	E298	03-May-2022	05-May-2022	----	----		05-May-2022	28 days	2 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E298	03-May-2022	05-May-2022	----	----		05-May-2022	28 days	2 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	03-May-2022	05-May-2022	----	----		05-May-2022	28 days	2 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE ELK RIVER DOWNSTREAM	E378-U	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE ELK RIVER OUTFALL	E378-U	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE ELK RIVER UPSTREAM	E378-U	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE WWTP EFFLUENT	E378-U	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE ELK RIVER DOWNSTREAM	E235.NO3-L	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE ELK RIVER OUTFALL	E235.NO3-L	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE ELK RIVER UPSTREAM	E235.NO3-L	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE WWTP EFFLUENT	E235.NO3-L	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE ELK RIVER DOWNSTREAM	E235.NO2-L	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER OUTFALL	E235.NO2-L	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO2-L	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO2-L	03-May-2022	----	----	----		05-May-2022	3 days	2 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E372-U	03-May-2022	11-May-2022	----	----		11-May-2022	28 days	8 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER OUTFALL	E372-U	03-May-2022	11-May-2022	----	----		11-May-2022	28 days	8 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E372-U	03-May-2022	11-May-2022	----	----		11-May-2022	28 days	8 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	03-May-2022	11-May-2022	----	----		11-May-2022	28 days	8 days	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	03-May-2022	----	----	----		05-May-2022	30 hrs	52 hrs	* EHTR	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER DOWNSTREAM	E012.FC	03-May-2022	----	----	----		05-May-2022	30 hrs	53 hrs	* EHTR	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER OUTFALL	E012.FC	03-May-2022	----	----	----		05-May-2022	30 hrs	53 hrs	*	EHTR
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER UPSTREAM	E012.FC	03-May-2022	----	----	----		05-May-2022	30 hrs	53 hrs	*	EHTR
Physical Tests : pH by Meter											
HDPE WWTP INFLUENT	E108	03-May-2022	----	----	----		05-May-2022	0.25 hrs	52 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE WWTP EFFLUENT	E108	03-May-2022	----	----	----		05-May-2022	0.25 hrs	53 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE ELK RIVER DOWNSTREAM	E108	03-May-2022	----	----	----		05-May-2022	0.25 hrs	54 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE ELK RIVER OUTFALL	E108	03-May-2022	----	----	----		05-May-2022	0.25 hrs	54 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE ELK RIVER UPSTREAM	E108	03-May-2022	----	----	----		05-May-2022	0.25 hrs	54 hrs	*	EHTR-FM
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER DOWNSTREAM	E160	03-May-2022	----	----	----		10-May-2022	7 days	7 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER OUTFALL	E160	03-May-2022	----	----	----		10-May-2022	7 days	7 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER UPSTREAM	E160	03-May-2022	----	----	----		10-May-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	03-May-2022	----	----	----		10-May-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	03-May-2022	----	----	----		10-May-2022	7 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 EHTR: Exceeded ALS recommended hold time prior to sample receipt.
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	478749	1	14	7.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	479809	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	478593	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	478550	2	39	5.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	478701	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	478702	1	20	5.0	5.0	✓
pH by Meter	E108	478559	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	479691	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	478421	1	13	7.6	5.0	✓
TSS by Gravimetry	E160	482148	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	478749	1	14	7.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	479809	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	478593	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	478550	2	39	5.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	478701	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	478702	1	20	5.0	5.0	✓
pH by Meter	E108	478559	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	478421	1	13	7.6	5.0	✓
TSS by Gravimetry	E160	482148	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	478749	1	14	7.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	479809	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	478593	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	478550	2	39	5.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	478701	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	478702	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	479691	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	478421	1	13	7.6	5.0	✓
TSS by Gravimetry	E160	482148	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	478749	1	14	7.1	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	478593	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	478550	2	39	5.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	478701	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	478702	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	478421	1	13	7.6	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : CG2205283

Page : 1 of 6

Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - SPRING EMS WEEK 6
PO : ----
C-O-C number : ----
Sampler : Kevin Mackey
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 05-May-2022 10:20
Date Analysis Commenced : 05-May-2022
Issue Date : 12-May-2022 15:28

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
Matrix Spike (MS) Report; Recovery and Acceptance Limits
Reference Material (RM) Report; Recovery and Acceptance Limits
Method Blank (MB) Report; Recovery and Acceptance Limits
Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Parker Sgarbossa, Ruifang Zheng, Sara Niroomand, and Sunil Palak.

Page : 2 of 6
Work Order : CG2205283
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - SPRING EMS WEEK 6



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 478559)											
CG2205270-011	Anonymous	pH	----	E108	0.10	pH units	8.34	8.37	0.359%	4%	----
Physical Tests (QC Lot: 482148)											
CG2205249-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	21.5	24.1	2.6	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 478421)											
CG2205275-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0346	0.0365	5.43%	20%	----
Anions and Nutrients (QC Lot: 478549)											
CG2205230-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0013	0.0015	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 478550)											
CG2205283-005	ELK RIVER DOWNSTREAM	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0024	0.0022	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 478701)											
CG2205254-005	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.234	0.232	0.989%	20%	----
Anions and Nutrients (QC Lot: 478702)											
CG2205254-005	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 478749)											
CG2205275-009	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Microbiological Tests (QC Lot: 479691)											
CG2205283-002	WWTP EFFLUENT	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 478593)											
CG2205250-011	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	171	168	1.22%	20%	----
Aggregate Organics (QC Lot: 479809)											
CG2205278-003	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 482148)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 478421)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 478549)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 478550)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 478701)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 478702)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 478749)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	MBRR
Microbiological Tests (QCLot: 479691)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 478593)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 479809)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----

Qualifiers

Qualifier	Description
MBRR	Initial MB for this submission had positive results for flagged analyte (data not shown). Low level samples were repeated with new QC (2nd MB results shown). High level results (>5x initial MB level) and non-detect results were reported and are defensible



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 478559)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 482148)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	95.7	85.0	115	----
Anions and Nutrients (QCLot: 478421)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	106	80.0	120	----
Anions and Nutrients (QCLot: 478549)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	108	80.0	120	----
Anions and Nutrients (QCLot: 478550)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	114	80.0	120	----
Anions and Nutrients (QCLot: 478701)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 478702)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 478749)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	----
Aggregate Organics (QCLot: 478593)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	98.9	85.0	115	----
Aggregate Organics (QCLot: 479809)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	92.6	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 478421)										
CG2205275-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0521 mg/L	0.0676 mg/L	77.1	70.0	130	----
Anions and Nutrients (QCLot: 478549)										
CG2205268-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0494 mg/L	0.05 mg/L	98.9	70.0	130	----
Anions and Nutrients (QCLot: 478550)										
CG2205286-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 478701)										
CG2205263-006	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.52 mg/L	2.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 478702)										
CG2205263-006	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.512 mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 478749)										
CG2205282-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.109 mg/L	0.1 mg/L	109	75.0	125	----
Aggregate Organics (QCLot: 478593)										
CG2205250-012	Anonymous	chemical oxygen demand [COD]	----	E559-L	92 mg/L	100 mg/L	92.2	75.0	125	----



SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:												
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST																
CITY: CALGARY	PROV: ALBERTA	POSTAL CODE: T2T 0E2														
PROJECT NAME AND NO.: FARUC - Spring EMS week 6		QUOTE NO.:														
PO NO.:	ALS CONTACT: Patryk Woyciak															
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:															
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)	
		YYYY-MM-DD	TIME													
FOR LAB USE ONLY	WWTP Influent Routine	2022-05-03	10:30	Water		X	X									8.9
	WWTP Influent BOD	2022-05-03		Water									X			
	WWTP Effluent Routine	2022-05-03	10:30	Water		X	X							X		10.5
	WWTP Effluent BOD	2022-05-03		Water									X			
	WWTP Effluent Nutrients	2022-05-03		Water				X	X	X	X	X				
	WWTP Effluent Bacteriological	2022-05-03		Water	X											
	Elk River Upstream Routine	2022-05-03	9:50	Water		X	X									
	Elk River Upstream Nutrients	2022-05-03		Water				X	X	X	X	X				
	Elk River Upstream Bacteriological	2022-05-03		Water	X											
	Elk River @ Outfall Routine	2022-05-03	9:40	Water		X	X									
	Elk River @ Outfall Nutrients	2022-05-03		Water				X	X	X	X	X				
	Elk River @ Outfall Bacteriological	2022-05-03		Water	X											
	Elk River Downstream Routine	2022-05-03	9:30	Water		X	X									
	Elk River Downstream Nutrients	2022-05-03		Water				X	X	X	X	X				
Elk River Downstream Bacteriological	2022-05-03		Water	X												

Environmental Division
 Calgary
 Work Order Reference
CG2205283

Telephone : +1 403 407 1800

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	DATE:	2022/05/03	RECEIVED BY:	DATE:	5/5
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)	Kevin Mackey	TIME:	11:15	PM	TIME:	10:20
INVOICE FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	RELINQUISHED BY:	DATE:		RECEIVED BY:	DATE:	
SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifermie.com	TIME:	TIME:		TIME:	TIME:	
				FOR LAB USE ONLY			
Cooler Seal Intact?		Sample Temperature: 14 °C		Cooling Method?			
Yes No N/A		Frozen? Yes No		Icepacks Ice		None	



CERTIFICATE OF ANALYSIS

Work Order	: CG2207576	Page	: 1 of 3
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC WWTP JUNE MONTHLY EMS	Date Samples Received	: 16-Jun-2022 08:50
PO	: ----	Date Analysis	: 16-Jun-2022
		Commenced	
C-O-C number	: ----	Issue Date	: 23-Jun-2022 13:48
Sampler	: KM		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
<i>BODP</i>	<i>BOD dilution results differed by more than 30% RPD. Precision of reported BOD result may be less than usual.</i>
<i>DLHC</i>	<i>Detection Limit Raised: Dilution required due to high concentration of test analyte(s).</i>



Analytical Results

CG2207576-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP INFLUENT -

Client sampling date / time: 15-Jun-2022 10:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.02	0.10	pH units	E108	22-Jun-2022	22-Jun-2022	534063
solids, total suspended [TSS]	----	30.8	3.0	mg/L	E160	-	22-Jun-2022	530679
Aggregate Organics								
biochemical oxygen demand [BOD]	----	24.1 ^{BODP}	6.0	mg/L	E550	-	17-Jun-2022	528460

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

Analytical Results

CG2207576-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP EFFLUENT -

Client sampling date / time: 15-Jun-2022 10:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.20	0.10	pH units	E108	22-Jun-2022	22-Jun-2022	534063
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	22-Jun-2022	530679
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0092	0.0050	mg/L	E298	21-Jun-2022	21-Jun-2022	532277
nitrate (as N)	14797-55-8	11.2	0.0050	mg/L	E235.NO3-L	17-Jun-2022	17-Jun-2022	527704
nitrite (as N)	14797-65-0	0.0062	0.0010	mg/L	E235.NO2-L	17-Jun-2022	17-Jun-2022	527703
phosphate, ortho-, dissolved (as P)	14265-44-2	0.310 ^{DLHC}	0.0100	mg/L	E378-U	16-Jun-2022	16-Jun-2022	526367
phosphorus, total	7723-14-0	0.321 ^{DLHC}	0.0100	mg/L	E372-U	18-Jun-2022	21-Jun-2022	528834
nitrate + nitrite (as N)	----	11.2	0.0051	mg/L	EC235.N+N	-	20-Jun-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	<1	1	CFU/100mL	E012.FC	-	16-Jun-2022	530255
Aggregate Organics								
biochemical oxygen demand [BOD]	----	<2.0	2.0	mg/L	E550	-	17-Jun-2022	528460

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2207576	Page	: 1 of 7
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC WWTP JUNE MONTHLY EMS	Date Samples Received	: 16-Jun-2022 08:50
PO	: ----	Issue Date	: 23-Jun-2022 13:48
C-O-C number	: ----		
Sampler	: KM		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

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



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	15-Jun-2022	----	----	----		17-Jun-2022	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP INFLUENT	E550	15-Jun-2022	----	----	----		17-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	15-Jun-2022	21-Jun-2022	----	----		21-Jun-2022	28 days	6 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE WWTP EFFLUENT	E378-U	15-Jun-2022	----	----	----		16-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE WWTP EFFLUENT	E235.NO3-L	15-Jun-2022	----	----	----		17-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE WWTP EFFLUENT	E235.NO2-L	15-Jun-2022	----	----	----		17-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	15-Jun-2022	18-Jun-2022	----	----		21-Jun-2022	28 days	6 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	15-Jun-2022	----	----	----		16-Jun-2022	30 hrs	25 hrs	✓
Physical Tests : pH by Meter										
HDPE WWTP EFFLUENT	E108	15-Jun-2022	----	----	----		22-Jun-2022	0.25 hrs	171 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE WWTP INFLUENT	E108	15-Jun-2022	----	----	----		22-Jun-2022	0.25 hrs	171 hrs	* EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	15-Jun-2022	----	----	----		22-Jun-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	15-Jun-2022	----	----	----		22-Jun-2022	7 days	7 days	✓

Legend & Qualifier Definitions

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

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



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	532277	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	528460	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	526367	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	527704	1	14	7.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	527703	1	14	7.1	5.0	✔
pH by Meter	E108	534063	1	13	7.6	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	530255	0	18	0.0	5.0	✖
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	528834	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	530679	1	20	5.0	5.0	✔
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	532277	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	528460	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	526367	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	527704	1	14	7.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	527703	1	14	7.1	5.0	✔
pH by Meter	E108	534063	1	13	7.6	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	528834	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	530679	1	20	5.0	5.0	✔
Method Blanks (MB)							
Ammonia by Fluorescence	E298	532277	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	528460	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	526367	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	527704	1	14	7.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	527703	1	14	7.1	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	530255	1	18	5.5	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	528834	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	530679	1	20	5.0	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	532277	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	526367	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	527704	1	14	7.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	527703	1	14	7.1	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	528834	1	20	5.0	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

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Work Order : CG2207576
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WWTP JUNE MONTHLY EMS



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : CG2207576
Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC WWTP JUNE MONTHLY EMS
PO : ----
C-O-C number : ----
Sampler : KM
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 6
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 16-Jun-2022 08:50
Date Analysis Commenced : 16-Jun-2022
Issue Date : 23-Jun-2022 13:49

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

This Quality Control Report contains the following information:

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

Signatories

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

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Parker Sgarbossa, Ruifang Zheng, Sara Niroomand, and Sunil Palak.

Page : 2 of 6
Work Order : CG2207576
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WWTP JUNE MONTHLY EMS



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 530679)											
CG2207507-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	26.4	22.2	4.2	Diff <2x LOR	----
Physical Tests (QC Lot: 534063)											
CG2207230-010	Anonymous	pH	----	E108	0.10	pH units	5.14	5.19	0.968%	4%	----
Anions and Nutrients (QC Lot: 526367)											
CG2207576-002	WWTP EFFLUENT	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0100	mg/L	0.310	0.317	2.21%	20%	----
Anions and Nutrients (QC Lot: 527703)											
FJ2201557-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 527704)											
FJ2201557-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0666	0.0663	0.451%	20%	----
Anions and Nutrients (QC Lot: 528834)											
CG2207576-002	WWTP EFFLUENT	phosphorus, total	7723-14-0	E372-U	0.0100	mg/L	0.321	0.315	1.77%	20%	----
Anions and Nutrients (QC Lot: 532277)											
CG2207543-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	2.50	mg/L	44.7	41.2	8.12%	20%	----
Aggregate Organics (QC Lot: 528460)											
CG2207582-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 530679)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 526367)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 527703)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 527704)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 528834)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 532277)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Microbiological Tests (QCLot: 530255)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 528460)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 530679)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	101	85.0	115	----
Physical Tests (QCLot: 534063)									
pH	----	E108	----	pH units	7 pH units	99.6	98.6	101	----
Anions and Nutrients (QCLot: 526367)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	99.0	80.0	120	----
Anions and Nutrients (QCLot: 527703)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 527704)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 528834)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	101	80.0	120	----
Anions and Nutrients (QCLot: 532277)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	104	85.0	115	----
Aggregate Organics (QCLot: 528460)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	102	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 526367)										
CG2207589-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0482 mg/L	0.05 mg/L	96.4	70.0	130	----
Anions and Nutrients (QCLot: 527703)										
FJ2201557-005	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.501 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 527704)										
FJ2201557-005	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.51 mg/L	2.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 528834)										
CG2207587-001	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.0676 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 532277)										
CG2207543-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0983 mg/L	0.1 mg/L	98.3	75.0	125	----



CERTIFICATE OF ANALYSIS

Work Order : **CG2209195**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : JULY MONTHLY WWTP EMS
PO : ----
C-O-C number : ----
Sampler : KM
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 14-Jul-2022 10:00
Date Analysis Commenced : 14-Jul-2022
Issue Date : 21-Jul-2022 15:43

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

Sub-Matrix: Water					Client sample ID	WWTP INFLUENT	WWTP EFFLUENT	----	----	----
(Matrix: Water)					Client sampling date / time	14-Jul-2022 14:30	14-Jul-2022 14:30	----	----	----
Analyte	CAS Number	Method	LOR	Unit	CG2209195-001	CG2209195-002	-----	-----	-----	
					Result	Result	---	---	---	
Physical Tests										
pH	----	E108	0.10	pH units	7.59	6.78	----	----	----	
solids, total suspended [TSS]	----	E160	3.0	mg/L	133	<3.0	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0097	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	29.4	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	0.0205	----	----	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	0.0321	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.144 ^{DLHC}	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	29.4	----	----	----	
Microbiological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	2	----	----	----	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	105	<2.0	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2209195	Page	: 1 of 7
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: JULY MONTHLY WWTP EMS	Date Samples Received	: 14-Jul-2022 10:00
PO	: ----	Issue Date	: 21-Jul-2022 15:43
C-O-C number	: ----		
Sampler	: KM		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	14-Jul-2022	----	----	----		14-Jul-2022	3 days	0 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP INFLUENT	E550	14-Jul-2022	----	----	----		14-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	14-Jul-2022	15-Jul-2022	----	----		15-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE WWTP EFFLUENT	E378-U	14-Jul-2022	----	----	----		14-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE WWTP EFFLUENT	E235.NO3-L	14-Jul-2022	----	----	----		16-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE WWTP EFFLUENT	E235.NO2-L	14-Jul-2022	----	----	----		16-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	14-Jul-2022	18-Jul-2022	----	----		20-Jul-2022	28 days	6 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	14-Jul-2022	----	----	----		14-Jul-2022	30 hrs	-6 hrs	✓	
Physical Tests : pH by Meter											
HDPE WWTP EFFLUENT	E108	14-Jul-2022	----	----	----		14-Jul-2022	0.25 hrs	0.97 hrs	* EHTL	
Physical Tests : pH by Meter											
HDPE WWTP INFLUENT	E108	14-Jul-2022	----	----	----		14-Jul-2022	0.25 hrs	0.97 hrs	* EHTL	
Physical Tests : TSS by Gravimetry											
HDPE WWTP EFFLUENT	E160	14-Jul-2022	----	----	----		21-Jul-2022	7 days	7 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE WWTP INFLUENT	E160	14-Jul-2022	----	----	----		21-Jul-2022	7 days	7 days	✓	

Legend & Qualifier Definitions

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

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



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	564365	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	562974	1	18	5.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	562908	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	565179	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	565178	1	16	6.2	5.0	✓
pH by Meter	E108	562934	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	564618	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	566879	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	568406	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	564365	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	562974	1	18	5.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	562908	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	565179	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	565178	1	16	6.2	5.0	✓
pH by Meter	E108	562934	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	566879	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	568406	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	564365	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	562974	1	18	5.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	562908	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	565179	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	565178	1	16	6.2	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	564618	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	566879	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	568406	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	564365	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	562908	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	565179	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	565178	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	566879	1	20	5.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

Page : 7 of 7
Work Order : CG2209195
Client : Fernie Alpine Resort Utilities Corporation
Project : JULY MONTHLY WWTP EMS



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : CG2209195
Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : JULY MONTHLY WWTP EMS
PO : ----
C-O-C number : ----
Sampler : KM
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 6
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 14-Jul-2022 10:00
Date Analysis Commenced : 14-Jul-2022
Issue Date : 21-Jul-2022 15:45

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

This Quality Control Report contains the following information:

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

Signatories

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

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Anthony Calero, Harpreet Chawla, Ruifang Zheng, Sara Niroomand, Sunil Palak.

Page : 2 of 6
Work Order : CG2209195
Client : Fernie Alpine Resort Utilities Corporation
Project : JULY MONTHLY WWTP EMS



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 562934)											
CG2209195-001	WWTP INFLUENT	pH	----	E108	0.10	pH units	7.59	7.67	1.05%	4%	----
Physical Tests (QC Lot: 568406)											
CG2209195-001	WWTP INFLUENT	solids, total suspended [TSS]	----	E160	3.0	mg/L	133	132	1.06%	20%	----
Anions and Nutrients (QC Lot: 562908)											
CG2209195-002	WWTP EFFLUENT	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0321	0.0315	1.86%	20%	----
Anions and Nutrients (QC Lot: 564365)											
CG2209195-002	WWTP EFFLUENT	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0097	0.0081	0.0016	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 565178)											
CG2209230-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 565179)											
CG2209230-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0760	0.0732	3.75%	20%	----
Anions and Nutrients (QC Lot: 566879)											
CG2209195-002	WWTP EFFLUENT	phosphorus, total	7723-14-0	E372-U	0.0040	mg/L	0.144	0.141	2.21%	20%	----
Microbiological Tests (QC Lot: 564618)											
CG2209160-002	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 562974)											
CG2209196-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 568406)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 562908)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 564365)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 565178)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 565179)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 566879)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 564618)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 562974)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 562934)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 568406)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	92.9	85.0	115	----
Anions and Nutrients (QCLot: 562908)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	101	80.0	120	----
Anions and Nutrients (QCLot: 564365)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	96.2	85.0	115	----
Anions and Nutrients (QCLot: 565178)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.9	90.0	110	----
Anions and Nutrients (QCLot: 565179)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 566879)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	101	80.0	120	----
Aggregate Organics (QCLot: 562974)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	100	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 562908)										
CG2209197-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0475 mg/L	0.05 mg/L	95.0	70.0	130	----
Anions and Nutrients (QCLot: 564365)										
CG2209256-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 565178)										
CG2209230-010	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.487 mg/L	0.5 mg/L	97.3	75.0	125	----
Anions and Nutrients (QCLot: 565179)										
CG2209230-010	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.39 mg/L	2.5 mg/L	95.7	75.0	125	----
Anions and Nutrients (QCLot: 566879)										
CG2209197-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0644 mg/L	0.0676 mg/L	95.3	70.0	130	----



Vancouver BC, 1989 Triumph Street, V5L 1K5, Tel: 804-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 Fax: 780-513-2191
 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383


SEND REPORT TO: **CG209195**

CHAIN OF CUSTODY FORM

PAGE **1** OF **1**

COMPANY:		FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:													
ADDRESS:		1505 - 17TH AVENUE SOUTH WEST																	
CITY:		CALGARY		PROV: ALBERTA		POSTAL CODE: T2T 0E2													
TEL:		403 - 256 - 8473		FAX: 403 - 244 - 3774		SAMPLER: Kevin Mackey													
PROJECT NAME AND NO.:		July Monthly WWTP EMS				QUOTE NO:													
PO NO.:				ALS CONTACT: Patryk Wojciak															
REPORT FORMAT:		<input checked="" type="checkbox"/> HARDCOPY		<input checked="" type="checkbox"/> EMAIL - ADDRESS: pmaier@skircr.com															
		<input type="checkbox"/> FAX		<input type="checkbox"/> EXCEL		<input checked="" type="checkbox"/> PDF		<input type="checkbox"/> OTHER:											
FOR LAB USE ONLY	WO#	SAMPLE IDENTIFICATION		DATE / TIME COLLECTED		MATRIX		Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)	
				YYYY-MM-DD	TIME														
			WWTP Influent Routine	2022-07-13	14:30	Water		X	X										
			WWTP Influent BOD	2022-07-13	14:30	Water											X		
			WWTP Effluent Routine	2022-07-13	14:30	Water		X	X										
			WWTP Effluent BOD	2022-07-13	14:30	Water											X		
			WWTP Effluent Nutrients	2022-07-13	14:30	Water					X	X	X	X	X				
			WWTP Effluent Bacteriological	2022-07-13	14:30	Water	X												

Environmental Division
 Calgary
 Work Order Reference
CG2209195



Telephone : +1 403 407 1800

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE	<input type="radio"/> RUSH	SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	DATE:	2022-07-13	RECEIVED BY:	DATE:
				Carter Barrett	TIME:	16:00	<i>[Signature]</i>	TIME:
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)			RELINQUISHED BY:	DATE:		RECEIVED BY:	DATE:
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX				TIME:		<i>[Signature]</i>	TIME:
SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com			FOR LAB USE ONLY				
				Cooler Seal Intact?	Sample Temperature:	_____ °C	Cooling Method?	
				Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Frozen?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None <input type="checkbox"/>	

Environmental Division
 Calgary
 Work Order Reference
CG2209195



CERTIFICATE OF ANALYSIS

Work Order	: CG2211365	Page	: 1 of 3
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC WWTP August Monthly EMS	Date Samples Received	: 25-Aug-2022 08:55
PO	: ----	Date Analysis	: 25-Aug-2022
		Commenced	
C-O-C number	: ----	Issue Date	: 31-Aug-2022 14:17
Sampler	: KEVIN MACKEY		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Catherine Fong	Lab Analyst	Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Katarzyna Glinka	Analyst	Microbiology, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

CG2211365-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP Influent

Client sampling date / time: 24-Aug-2022 10:15

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.10	0.10	pH units	E108	25-Aug-2022	25-Aug-2022	619157
solids, total suspended [TSS]	----	110	3.0	mg/L	E160	-	29-Aug-2022	620932
Aggregate Organics								
biochemical oxygen demand [BOD]	----	73.4	20.0	mg/L	E550	-	25-Aug-2022	619645

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

Analytical Results

CG2211365-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP Effluent

Client sampling date / time: 24-Aug-2022 10:15

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	7.84	0.10	pH units	E108	25-Aug-2022	25-Aug-2022	619157
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	29-Aug-2022	620932
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0137	0.0050	mg/L	E298	25-Aug-2022	25-Aug-2022	618733
nitrate (as N)	14797-55-8	31.2	0.0250	mg/L	E235.NO3-L	25-Aug-2022	25-Aug-2022	619030
nitrite (as N)	14797-65-0	0.0178	0.0050	mg/L	E235.NO2-L	25-Aug-2022	25-Aug-2022	619031
phosphate, ortho-, dissolved (as P)	14265-44-2	0.257 ^{DLHC}	0.0100	mg/L	E378-U	25-Aug-2022	25-Aug-2022	618576
phosphorus, total	7723-14-0	0.317 ^{DLHC}	0.0100	mg/L	E372-U	29-Aug-2022	31-Aug-2022	623557
nitrate + nitrite (as N)	----	31.2	0.0255	mg/L	EC235.N+N	-	26-Aug-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	<1	1	CFU/100mL	E012.FC	-	25-Aug-2022	620412
Aggregate Organics								
biochemical oxygen demand [BOD]	----	<2.0	2.0	mg/L	E550	-	25-Aug-2022	619645

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2211365	Page	: 1 of 7
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC WWTP August Monthly EMS	Date Samples Received	: 25-Aug-2022 08:55
PO	: ----	Issue Date	: 31-Aug-2022 14:13
C-O-C number	: ----		
Sampler	: KEVIN MACKEY		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP Effluent	E550	24-Aug-2022	----	----	----		25-Aug-2022	3 days	1 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] WWTP Influent	E550	24-Aug-2022	----	----	----		25-Aug-2022	3 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) WWTP Effluent	E298	24-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	1 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)											
HDPE WWTP Effluent	E378-U	24-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE WWTP Effluent	E235.NO3-L	24-Aug-2022	25-Aug-2022	3 days	1 days	✓	25-Aug-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE WWTP Effluent	E235.NO2-L	24-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	1 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) WWTP Effluent	E372-U	24-Aug-2022	29-Aug-2022	----	----		31-Aug-2022	28 days	7 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) WWTP Effluent	E012.FC	24-Aug-2022	----	----	----		25-Aug-2022	30 hrs	24 hrs	✓
Physical Tests : pH by Meter										
HDPE WWTP Effluent	E108	24-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	0.25 hrs	0.26 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE WWTP Influent	E108	24-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	0.25 hrs	0.26 hrs	* EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE WWTP Effluent	E160	24-Aug-2022	----	----	----		29-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP Influent	E160	24-Aug-2022	----	----	----		29-Aug-2022	7 days	5 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	618733	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	619645	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	618576	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	619030	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	619031	1	20	5.0	5.0	✓
pH by Meter	E108	619157	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	620412	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	623557	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	620932	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	618733	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	619645	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	618576	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	619030	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	619031	1	20	5.0	5.0	✓
pH by Meter	E108	619157	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	623557	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	620932	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	618733	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	619645	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	618576	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	619030	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	619031	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	620412	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	623557	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	620932	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	618733	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	618576	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	619030	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	619031	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	623557	1	20	5.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

Page : 7 of 7
Work Order : CG2211365
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WWTP August Monthly EMS



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : CG2211365
Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC WWTP August Monthly EMS
PO : ----
C-O-C number : ----
Sampler : KEVIN MACKEY
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 6
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 25-Aug-2022 08:55
Date Analysis Commenced : 25-Aug-2022
Issue Date : 31-Aug-2022 14:11

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

This Quality Control Report contains the following information:

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

Signatories

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

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Anthony Calero, Catherine Fong, Harpreet Chawla, Katarzyna Glinka, Parker Sgarbossa, Sara Niroomand, and Vladka Stamenova.

Page : 2 of 6
Work Order : CG2211365
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WWTP August Monthly EMS



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 619157)											
CG2211287-004	Anonymous	pH	----	E108	0.10	pH units	7.89	7.91	0.253%	4%	----
Physical Tests (QC Lot: 620932)											
CG2211358-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	12.7	12.3	0.4	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 618576)											
CG2211364-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0016	0.0014	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 618733)											
CG2211365-002	WWTP Effluent	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0137	0.0107	0.0030	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 619030)											
CG2211393-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.100	mg/L	141	141	0.109%	20%	----
Anions and Nutrients (QC Lot: 619031)											
CG2211393-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0200	mg/L	0.108	0.117	0.0098	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 623557)											
CG2211358-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.200	mg/L	7.72	7.71	0.146%	20%	----
Microbiological Tests (QC Lot: 620412)											
CG2211365-002	WWTP Effluent	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 619645)											
CG2211349-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 620932)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 618576)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 618733)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 619030)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 619031)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 623557)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 620412)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 619645)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 619157)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 620932)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	96.4	85.0	115	----
Anions and Nutrients (QCLot: 618576)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	98.3	80.0	120	----
Anions and Nutrients (QCLot: 618733)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 619030)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	98.1	90.0	110	----
Anions and Nutrients (QCLot: 619031)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 623557)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	99.2	80.0	120	----
Aggregate Organics (QCLot: 619645)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	99.0	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 618576)										
CG2211364-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0463 mg/L	0.05 mg/L	92.7	70.0	130	----
Anions and Nutrients (QCLot: 618733)										
CG2211371-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.105 mg/L	0.1 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 619030)										
CG2211393-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	ND mg/L	2.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 619031)										
CG2211393-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.570 mg/L	0.5 mg/L	114	75.0	125	----
Anions and Nutrients (QCLot: 623557)										
CG2211365-002	WWTP Effluent	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----

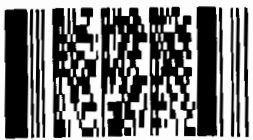


Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 9595 - 111 Street, T8V 5V1, Tel: 780-538-5196 Toll Free: 1-800-668-9878 Fax: 780-513-2181
 Fort McMurray AB, Bay 1, 245 Macdonald Cr. T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 Edmonton AB, 9938 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-688-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:											
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST				Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)	
CITY: CALGARY	PROV: ALBERTA	POSTAL CODE: T2T 0E2													
TEL: 403 - 256 - 8473	FAX: 403 - 244 - 3774	SAMPLER: Kevin Mackey													
PROJECT NAME AND NO.: FARUC WWTP August Monthly EMS		QUOTE NO.:													
PO NO.:	ALS CONTACT: Patryk Wojciak														
REPORT FORMAT:		<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com													
		<input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:													
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME												
	WWTP Influent Routine	2022-08-24	10:15	Water		X	X								
	WWTP Influent BOD	2022-08-24	10:15	Water									X		
	WWTP Effluent Routine	2022-08-24	10:15	Water		X	X								
	WWTP Effluent BOD	2022-08-24	10:15	Water									X		
	WWTP Effluent Nutrients	2022-08-24	10:15	Water				X	X	X	X	X			
	WWTP Effluent Bacteriological	2022-08-24	10:15	Water	X										
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p>Environmental Division Calgary Work Order Reference CG2211365</p>  <p>Telephone : + 1 403 407 1800</p> </div>															
TURN AROUND REQUIRED: <input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)				RELINQUISHED BY: Carter Barrett		DATE: 2022-08-24		RECEIVED BY: <i>ML</i>		DATE: <i>8/25</i>		TIME: 11:15		TIME: <i>8:35</i>	
SEND INVOICE TO: <input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)				RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:		TIME:		TIME:	
INVOICE FORMAT: <input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX															
SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifermie.com				FOR LAB USE ONLY											
				Cooler Seal Intact? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Sample Temperature: <i>10</i> °C		Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No		Cooling Method? <input type="checkbox"/> Icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None					

FOR LAB USE ONLY



CERTIFICATE OF ANALYSIS

Work Order : **CG2211733**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
 Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - Fall EMS week 1
PO : ----
C-O-C number : ----
Sampler : Kevin Mackey
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
 Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 01-Sep-2022 09:03
Date Analysis Commenced : 01-Sep-2022
Issue Date : 07-Sep-2022 16:55

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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



Analytical Results

Sub-Matrix: Water					Client sample ID	Elk River Upstream	Elk River @ Outfall	Elk River Downstream	----	----
(Matrix: Water)					Client sampling date / time	31-Aug-2022 10:15	31-Aug-2022 10:20	31-Aug-2022 10:20	----	----
Analyte	CAS Number	Method	LOR	Unit	CG2211733-001	CG2211733-002	CG2211733-003	-----	-----	
					Result	Result	Result	----	----	
Physical Tests										
pH	----	E108	0.10	pH units	8.26	8.41	8.24	----	----	
solids, total suspended [TSS]	----	E160	3.0	mg/L	3.1	<3.0	4.1	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0071	0.0133	<0.0050	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	1.82	7.51	1.84	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0015	0.0240	0.0015	----	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	0.0337	<0.0010	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0047	0.0456	0.0109	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	1.82	7.53	1.84	----	----	
Microbiological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	8	97	11	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2211733	Page	: 1 of 8
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - Fall EMS week 1	Date Samples Received	: 01-Sep-2022 09:03
PO	: ----	Issue Date	: 07-Sep-2022 16:55
C-O-C number	: ----		
Sampler	: Kevin Mackey		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River @ Outfall	E298	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River Downstream	E298	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River Upstream	E298	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Elk River @ Outfall	E378-U	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Elk River Downstream	E378-U	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Elk River Upstream	E378-U	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	3 days	1 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Elk River @ Outfall	E235.NO3-L	31-Aug-2022	01-Sep-2022	3 days	1 days	✔	01-Sep-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Elk River Downstream	E235.NO3-L	31-Aug-2022	01-Sep-2022	3 days	1 days	✔	01-Sep-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Elk River Upstream	E235.NO3-L	31-Aug-2022	01-Sep-2022	3 days	1 days	✔	01-Sep-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Elk River @ Outfall	E235.NO2-L	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Elk River Downstream	E235.NO2-L	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Elk River Upstream	E235.NO2-L	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	3 days	1 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) Elk River @ Outfall	E372-U	31-Aug-2022	01-Sep-2022	----	----		02-Sep-2022	28 days	2 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) Elk River Downstream	E372-U	31-Aug-2022	01-Sep-2022	----	----		02-Sep-2022	28 days	2 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) Elk River Upstream	E372-U	31-Aug-2022	01-Sep-2022	----	----		02-Sep-2022	28 days	2 days	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River @ Outfall	E012.FC	31-Aug-2022	----	----	----		01-Sep-2022	30 hrs	24 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River Downstream	E012.FC	31-Aug-2022	----	----	----		01-Sep-2022	30 hrs	24 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River Upstream	E012.FC	31-Aug-2022	----	----	----		01-Sep-2022	30 hrs	24 hrs	✓	
Physical Tests : pH by Meter											
HDPE Elk River @ Outfall	E108	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Elk River Downstream	E108	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Elk River Upstream	E108	31-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE Elk River @ Outfall	E160	31-Aug-2022	----	----	----		06-Sep-2022	7 days	6 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE Elk River Downstream	E160	31-Aug-2022	----	----	----		06-Sep-2022	7 days	6 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE Elk River Upstream	E160	31-Aug-2022	----	----	----		06-Sep-2022	7 days	6 days	✓	

Legend & Qualifier Definitions

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

Page : 6 of 8
Work Order : CG2211733
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - Fall EMS week 1



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



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	629030	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	628938	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	628685	1	15	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	628686	1	13	7.6	5.0	✓
pH by Meter	E108	628870	1	19	5.2	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	631152	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	628971	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	633451	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	629030	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	628938	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	628685	1	15	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	628686	1	13	7.6	5.0	✓
pH by Meter	E108	628870	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	628971	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	633451	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	629030	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	628938	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	628685	1	15	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	628686	1	13	7.6	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	631152	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	628971	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	633451	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	629030	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	628938	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	628685	1	15	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	628686	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	628971	1	19	5.2	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : CG2211733
Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - Fall EMS week 1
PO : ----
C-O-C number : ----
Sampler : Kevin Mackey
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 6
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 01-Sep-2022 09:03
Date Analysis Commenced : 01-Sep-2022
Issue Date : 07-Sep-2022 16:56

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

This Quality Control Report contains the following information:

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

Signatories

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

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Harpreet Chawla, Parker Sgarbossa, Ruifang Zheng, Sara Niroomand, Sunil Palak, and Vladka Stamenova.

Page : 2 of 6
Work Order : CG2211733
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - Fall EMS week 1



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 628870)											
CG2211721-001	Anonymous	pH	----	E108	0.10	pH units	6.96	7.01	0.716%	4%	----
Physical Tests (QC Lot: 633451)											
CG2211733-001	Elk River Upstream	solids, total suspended [TSS]	----	E160	3.0	mg/L	3.1	3.3	0.2	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 628685)											
CG2211705-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.490	0.490	0.102%	20%	----
Anions and Nutrients (QC Lot: 628686)											
CG2211705-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 628938)											
CG2211705-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0030	0.0030	0.00001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 628971)											
CG2211703-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.200	mg/L	7.56	7.86	3.98%	20%	----
Anions and Nutrients (QC Lot: 629030)											
CG2211708-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0183	0.0166	0.0017	Diff <2x LOR	----
Microbiological Tests (QC Lot: 631152)											
CG2211718-001	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 633451)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 628685)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 628686)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 628938)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 628971)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 629030)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Microbiological Tests (QCLot: 631152)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 628870)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 633451)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	92.5	85.0	115	----
Anions and Nutrients (QCLot: 628685)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 628686)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 628938)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	100	80.0	120	----
Anions and Nutrients (QCLot: 628971)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	94.0	80.0	120	----
Anions and Nutrients (QCLot: 629030)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	101	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 628685)										
CG2211705-003	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.74 mg/L	2.5 mg/L	110	75.0	125	----
Anions and Nutrients (QCLot: 628686)										
CG2211705-003	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.556 mg/L	0.5 mg/L	111	75.0	125	----
Anions and Nutrients (QCLot: 628938)										
CG2211705-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0489 mg/L	0.05 mg/L	97.8	70.0	130	----
Anions and Nutrients (QCLot: 628971)										
CG2211703-002	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 629030)										
CG2211733-001	Elk River Upstream	ammonia, total (as N)	7664-41-7	E298	0.0915 mg/L	0.1 mg/L	91.5	75.0	125	----



CERTIFICATE OF ANALYSIS

Work Order	: CG2212103	Page	: 1 of 4
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - Fall EMS week 2	Date Samples Received	: 08-Sep-2022 08:50
PO	: ----	Date Analysis	: 08-Sep-2022
C-O-C number	: ----	Commenced	
Sampler	: Carter Barrett	Issue Date	: 14-Sep-2022 11:18
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

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

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

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



Analytical Results

CG2212103-001

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID: Elk River Upstream

Client sampling date / time: 07-Sep-2022 10:30

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.40	0.10	pH units	E108	08-Sep-2022	08-Sep-2022	638195
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	13-Sep-2022	639970
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0091	0.0050	mg/L	E298	08-Sep-2022	08-Sep-2022	638603
nitrate (as N)	14797-55-8	1.83	0.0050	mg/L	E235.NO3-L	08-Sep-2022	08-Sep-2022	638014
nitrite (as N)	14797-65-0	0.0022	0.0010	mg/L	E235.NO2-L	08-Sep-2022	08-Sep-2022	638013
phosphate, ortho-, dissolved (as P)	14265-44-2	<0.0010	0.0010	mg/L	E378-U	08-Sep-2022	08-Sep-2022	638396
phosphorus, total	7723-14-0	0.0028	0.0020	mg/L	E372-U	08-Sep-2022	13-Sep-2022	637946
nitrate + nitrite (as N)	----	1.83	0.0051	mg/L	EC235.N+N	-	09-Sep-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	7	1	CFU/100mL	E012.FC	-	08-Sep-2022	640199

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

Analytical Results

CG2212103-002

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID: Elk River @ Outfall

Client sampling date / time: 07-Sep-2022 10:40

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.00	0.10	pH units	E108	08-Sep-2022	08-Sep-2022	638195
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	13-Sep-2022	639970
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0206	0.0050	mg/L	E298	08-Sep-2022	08-Sep-2022	638603
nitrate (as N)	14797-55-8	9.91	0.0050	mg/L	E235.NO3-L	08-Sep-2022	08-Sep-2022	638014
nitrite (as N)	14797-65-0	0.0568	0.0010	mg/L	E235.NO2-L	08-Sep-2022	08-Sep-2022	638013
phosphate, ortho-, dissolved (as P)	14265-44-2	0.0176	0.0010	mg/L	E378-U	08-Sep-2022	08-Sep-2022	638396
phosphorus, total	7723-14-0	0.0316	0.0020	mg/L	E372-U	08-Sep-2022	13-Sep-2022	637946
nitrate + nitrite (as N)	----	9.97	0.0051	mg/L	EC235.N+N	-	09-Sep-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	5	1	CFU/100mL	E012.FC	-	08-Sep-2022	640199

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

Analytical Results

CG2212103-003

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID: Elk River Downstream

Client sampling date / time: 07-Sep-2022 10:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.40	0.10	pH units	E108	08-Sep-2022	08-Sep-2022	638195
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	13-Sep-2022	639970
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	<0.0050	0.0050	mg/L	E298	08-Sep-2022	08-Sep-2022	638603



Analytical Results

CG2212103-003

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID: Elk River Downstream

Client sampling date / time: 07-Sep-2022 10:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients								
nitrate (as N)	14797-55-8	1.83	0.0050	mg/L	E235.NO3-L	08-Sep-2022	08-Sep-2022	638014
nitrite (as N)	14797-65-0	0.0024	0.0010	mg/L	E235.NO2-L	08-Sep-2022	08-Sep-2022	638013
phosphate, ortho-, dissolved (as P)	14265-44-2	<0.0010	0.0010	mg/L	E378-U	08-Sep-2022	08-Sep-2022	638396
phosphorus, total	7723-14-0	0.0035	0.0020	mg/L	E372-U	08-Sep-2022	13-Sep-2022	637946
nitrate + nitrite (as N)	----	1.83	0.0051	mg/L	EC235.N+N	-	09-Sep-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	12	1	CFU/100mL	E012.FC	-	08-Sep-2022	640199

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2212103	Page	: 1 of 8
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - Fall EMS week 2	Date Samples Received	: 08-Sep-2022 08:50
PO	: ----	Issue Date	: 14-Sep-2022 11:20
C-O-C number	: ----		
Sampler	: Carter Barrett		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River @ Outfall	E298	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River Downstream	E298	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River Upstream	E298	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Elk River @ Outfall	E378-U	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Elk River Downstream	E378-U	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Elk River Upstream	E378-U	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Elk River @ Outfall	E235.NO3-L	07-Sep-2022	08-Sep-2022	3 days	1 days	✔	08-Sep-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Elk River Downstream	E235.NO3-L	07-Sep-2022	08-Sep-2022	3 days	1 days	✔	08-Sep-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Elk River Upstream	E235.NO3-L	07-Sep-2022	08-Sep-2022	3 days	1 days	✔	08-Sep-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Elk River @ Outfall	E235.NO2-L	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Elk River Downstream	E235.NO2-L	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Elk River Upstream	E235.NO2-L	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) Elk River @ Outfall	E372-U	07-Sep-2022	08-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) Elk River Downstream	E372-U	07-Sep-2022	08-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) Elk River Upstream	E372-U	07-Sep-2022	08-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River @ Outfall	E012.FC	07-Sep-2022	----	----	----		08-Sep-2022	30 hrs	25 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River Downstream	E012.FC	07-Sep-2022	----	----	----		08-Sep-2022	30 hrs	25 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River Upstream	E012.FC	07-Sep-2022	----	----	----		08-Sep-2022	30 hrs	26 hrs	✓	
Physical Tests : pH by Meter											
HDPE Elk River @ Outfall	E108	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	0.25 hrs	0.27 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Elk River Downstream	E108	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	0.25 hrs	0.27 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Elk River Upstream	E108	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	0.25 hrs	0.27 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE Elk River @ Outfall	E160	07-Sep-2022	----	----	----		13-Sep-2022	7 days	6 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE Elk River Downstream	E160	07-Sep-2022	----	----	----		13-Sep-2022	7 days	6 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE Elk River Upstream	E160	07-Sep-2022	----	----	----		13-Sep-2022	7 days	6 days	✓	

Legend & Qualifier Definitions

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

Page : 6 of 8
Work Order : CG2212103
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - Fall EMS week 2



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



Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	638603	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	638396	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	638014	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	638013	1	17	5.8	5.0	✓
pH by Meter	E108	638195	1	19	5.2	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	640199	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	637946	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	639970	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	638603	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	638396	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	638014	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	638013	1	17	5.8	5.0	✓
pH by Meter	E108	638195	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	637946	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	639970	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	638603	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	638396	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	638014	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	638013	1	17	5.8	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	640199	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	637946	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	639970	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	638603	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	638396	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	638014	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	638013	1	17	5.8	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	637946	1	20	5.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : **CG2212103**

Client : Fernie Alpine Resort Utilities Corporation

Contact : Patrick Majer

Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2

Telephone : 403 254 7669

Project : FARUC - Fall EMS week 2

PO : ----

C-O-C number : ----

Sampler : Carter Barrett

Site : ----

Quote number : CG21-FARU100-0002

No. of samples received : 3

No. of samples analysed : 3

Page : 1 of 6

Laboratory : Calgary - Environmental

Account Manager : Patryk Wojciak

Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5

Telephone : +1 403 407 1800

Date Samples Received : 08-Sep-2022 08:50

Date Analysis Commenced : 08-Sep-2022

Issue Date : 14-Sep-2022 11:18

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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sunil Palak		Calgary Microbiology, Calgary, Alberta

Page : 2 of 6
Work Order : CG2212103
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - Fall EMS week 2



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 638195)											
CG2212084-001	Anonymous	pH	----	E108	0.10	pH units	8.30	8.32	0.241%	4%	----
Physical Tests (QC Lot: 639970)											
CG2212084-002	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	8.9	7.5	1.4	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 637946)											
CG2212090-004	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 638013)											
CG2212116-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0161	0.0162	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 638014)											
CG2212116-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	23.6	23.7	0.399%	20%	----
Anions and Nutrients (QC Lot: 638396)											
CG2212103-001	Elk River Upstream	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 638603)											
CG2212102-004	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0065	0.0056	0.0009	Diff <2x LOR	----
Microbiological Tests (QC Lot: 640199)											
CG2212103-001	Elk River Upstream	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	7	5	33.3%	65%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 639970)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 637946)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 638013)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 638014)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 638396)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 638603)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Microbiological Tests (QCLot: 640199)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 638195)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 639970)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	90.4	85.0	115	----
Anions and Nutrients (QCLot: 637946)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	95.0	80.0	120	----
Anions and Nutrients (QCLot: 638013)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.8	90.0	110	----
Anions and Nutrients (QCLot: 638014)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 638396)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	97.5	80.0	120	----
Anions and Nutrients (QCLot: 638603)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.0	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 637946)										
CG2212090-005	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0408 mg/L	0.05 mg/L	81.7	70.0	130	----
Anions and Nutrients (QCLot: 638013)										
CG2212116-008	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.513 mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 638014)										
CG2212116-008	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.53 mg/L	2.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 638396)										
CG2212103-002	Elk River @ Outfall	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0491 mg/L	0.05 mg/L	98.3	70.0	130	----
Anions and Nutrients (QCLot: 638603)										
CG2212102-005	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.106 mg/L	0.1 mg/L	106	75.0	125	----



Vancouver BC, 1988 Triumph Street, v5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5198 Toll Free: 1-800-668-9878 Fax: 780-513-2191
 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8363

CHAIN OF CUSTODY FORM

SEND REPORT TO:

COMPANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION			ATTN:	PATRICK MAJER	ANALYSIS REQUESTED:											
ADDRESS:	1505 - 17TH AVENUE SOUTH WEST																
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2												
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Carter Barrett												
PROJECT NAME AND NO.:	FARUC - Fall EMS week 2			QUOTE NO.:													
PO NO.:		ALS CONTACT:	Patryk Woyciak														
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:																

WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME												
	Elk River Upstream Routine	2022-08-07	10:30	Water		X	X								
	Elk River Upstream Nutrients	2022-08-07	10:30	Water				X	X	X	X	X			
	Elk River Upstream Bacteriological	2022-08-07	10:30	Water	X										
	Elk River @ Outfall Routine	2022-08-07	10:40	Water		X	X								
	Elk River @ Outfall Nutrients	2022-08-07	10:40	Water				X	X	X	X	X			
	Elk River @ Outfall Bacteriological	2022-08-07	10:40	Water	X										
	Elk River Downstream Routine	2022-08-07	10:50	Water		X	X								
	Elk River Downstream Nutrients	2022-08-07	10:50	Water				X	X	X	X	X			
	Elk River Downstream Bacteriological	2022-08-07	10:50	Water	X										
		Bo9													

Environmental Division
 Calgary
 Work Order Reference
CG2212103

Telephone : +1 403 407 1800

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	DATE:	2022/09/07	RECEIVED BY:	DATE:	
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)	Carter Barrett	TIME:	11:15		TIME:	
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	RELINQUISHED BY:	DATE:		RECEIVED BY:	DATE:	
SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com		TIME:			TIME:	
FOR LAB USE ONLY		Cooler Seal Intact?	Sample Temperature: _____ °C	Cooling Method?			
		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None			



CERTIFICATE OF ANALYSIS

Work Order	: CG2212589	Page	: 1 of 4
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - Fall EMS week 3	Date Samples Received	: 16-Sep-2022 08:55
PO	: ----	Date Analysis	: 16-Sep-2022
C-O-C number	: ----	Commenced	
Sampler	: CARTER BARRETT	Issue Date	: 23-Sep-2022 16:13
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

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

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

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



Analytical Results

CG2212589-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: ELK RIVER UPSTREAM

Client sampling date / time: 15-Sep-2022 09:30

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.33	0.10	pH units	E108	16-Sep-2022	16-Sep-2022	650767
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	20-Sep-2022	654075
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0078	0.0050	mg/L	E298	19-Sep-2022	19-Sep-2022	653701
nitrate (as N)	14797-55-8	1.92	0.0050	mg/L	E235.NO3-L	16-Sep-2022	16-Sep-2022	650790
nitrite (as N)	14797-65-0	0.0022	0.0010	mg/L	E235.NO2-L	16-Sep-2022	16-Sep-2022	650791
phosphate, ortho-, dissolved (as P)	14265-44-2	<0.0010	0.0010	mg/L	E378-U	16-Sep-2022	16-Sep-2022	651016
phosphorus, total	7723-14-0	0.0030	0.0020	mg/L	E372-U	19-Sep-2022	23-Sep-2022	653699
nitrate + nitrite (as N)	----	1.92	0.0051	mg/L	EC235.N+N	-	17-Sep-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	15	1	CFU/100mL	E012.FC	-	16-Sep-2022	653466

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

Analytical Results

CG2212589-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: ELK RIVER @ OUTFALL

Client sampling date / time: 15-Sep-2022 09:15

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	7.93	0.10	pH units	E108	16-Sep-2022	16-Sep-2022	650767
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	20-Sep-2022	654075
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0164	0.0050	mg/L	E298	19-Sep-2022	19-Sep-2022	653701
nitrate (as N)	14797-55-8	13.6	0.0050	mg/L	E235.NO3-L	16-Sep-2022	16-Sep-2022	650790
nitrite (as N)	14797-65-0	0.0796	0.0010	mg/L	E235.NO2-L	16-Sep-2022	16-Sep-2022	650791
phosphate, ortho-, dissolved (as P)	14265-44-2	0.0469	0.0010	mg/L	E378-U	16-Sep-2022	16-Sep-2022	651016
phosphorus, total	7723-14-0	0.0498	0.0020	mg/L	E372-U	19-Sep-2022	23-Sep-2022	653699
nitrate + nitrite (as N)	----	13.7	0.0051	mg/L	EC235.N+N	-	17-Sep-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	118	1	CFU/100mL	E012.FC	-	16-Sep-2022	653466

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

Analytical Results

CG2212589-003

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: ELK RIVER DOWNSTREAM

Client sampling date / time: 15-Sep-2022 09:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.31	0.10	pH units	E108	16-Sep-2022	16-Sep-2022	650767
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	20-Sep-2022	654075
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0155	0.0050	mg/L	E298	19-Sep-2022	19-Sep-2022	653701



Analytical Results

CG2212589-003

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID: ELK RIVER DOWNSTREAM

Client sampling date / time: 15-Sep-2022 09:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients								
nitrate (as N)	14797-55-8	1.94	0.0050	mg/L	E235.NO3-L	16-Sep-2022	16-Sep-2022	650790
nitrite (as N)	14797-65-0	0.0022	0.0010	mg/L	E235.NO2-L	16-Sep-2022	16-Sep-2022	650791
phosphate, ortho-, dissolved (as P)	14265-44-2	<0.0010	0.0010	mg/L	E378-U	16-Sep-2022	16-Sep-2022	651016
phosphorus, total	7723-14-0	0.0060	0.0020	mg/L	E372-U	19-Sep-2022	23-Sep-2022	653699
nitrate + nitrite (as N)	----	1.94	0.0051	mg/L	EC235.N+N	-	17-Sep-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	19	1	CFU/100mL	E012.FC	-	16-Sep-2022	653466

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2212589	Page	: 1 of 8
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - Fall EMS week 3	Date Samples Received	: 16-Sep-2022 08:55
PO	: ----	Issue Date	: 23-Sep-2022 16:15
C-O-C number	: ----		
Sampler	: CARTER BARRETT		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E298	15-Sep-2022	19-Sep-2022	----	----		19-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E298	15-Sep-2022	19-Sep-2022	----	----		19-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E298	15-Sep-2022	19-Sep-2022	----	----		19-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE ELK RIVER @ OUTFALL	E378-U	15-Sep-2022	16-Sep-2022	----	----		16-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE ELK RIVER DOWNSTREAM	E378-U	15-Sep-2022	16-Sep-2022	----	----		16-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE ELK RIVER UPSTREAM	E378-U	15-Sep-2022	16-Sep-2022	----	----		16-Sep-2022	3 days	1 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER @ OUTFALL	E235.NO3-L	15-Sep-2022	16-Sep-2022	3 days	1 days	✔	16-Sep-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO3-L	15-Sep-2022	16-Sep-2022	3 days	1 days	✔	16-Sep-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO3-L	15-Sep-2022	16-Sep-2022	3 days	1 days	✔	16-Sep-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER @ OUTFALL	E235.NO2-L	15-Sep-2022	16-Sep-2022	----	----		16-Sep-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO2-L	15-Sep-2022	16-Sep-2022	----	----		16-Sep-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO2-L	15-Sep-2022	16-Sep-2022	----	----		16-Sep-2022	3 days	1 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E372-U	15-Sep-2022	19-Sep-2022	----	----		23-Sep-2022	28 days	8 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E372-U	15-Sep-2022	19-Sep-2022	----	----		23-Sep-2022	28 days	8 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E372-U	15-Sep-2022	19-Sep-2022	----	----		23-Sep-2022	28 days	8 days	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER @ OUTFALL	E012.FC	15-Sep-2022	----	----	----		16-Sep-2022	30 hrs	25 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER UPSTREAM	E012.FC	15-Sep-2022	----	----	----		16-Sep-2022	30 hrs	25 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER DOWNSTREAM	E012.FC	15-Sep-2022	----	----	----		16-Sep-2022	30 hrs	26 hrs	✓	
Physical Tests : pH by Meter											
HDPE ELK RIVER @ OUTFALL	E108	15-Sep-2022	16-Sep-2022	----	----		16-Sep-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER DOWNSTREAM	E108	15-Sep-2022	16-Sep-2022	----	----		16-Sep-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER UPSTREAM	E108	15-Sep-2022	16-Sep-2022	----	----		16-Sep-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER @ OUTFALL	E160	15-Sep-2022	----	----	----		20-Sep-2022	7 days	5 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER DOWNSTREAM	E160	15-Sep-2022	----	----	----		20-Sep-2022	7 days	5 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER UPSTREAM	E160	15-Sep-2022	----	----	----		20-Sep-2022	7 days	5 days	✓	

Legend & Qualifier Definitions

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

Page : 6 of 8
Work Order : CG2212589
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - Fall EMS week 3



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



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	653701	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	651016	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	650790	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	650791	1	16	6.2	5.0	✓
pH by Meter	E108	650767	1	9	11.1	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	653466	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	653699	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	654075	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	653701	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	651016	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	650790	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	650791	1	16	6.2	5.0	✓
pH by Meter	E108	650767	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	653699	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	654075	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	653701	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	651016	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	650790	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	650791	1	16	6.2	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	653466	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	653699	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	654075	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	653701	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	651016	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	650790	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	650791	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	653699	1	20	5.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : **CG2212589**

Client : Fernie Alpine Resort Utilities Corporation

Contact : Patrick Majer

Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2

Telephone : 403 254 7669

Project : FARUC - Fall EMS week 3

PO : ----

C-O-C number : ----

Sampler : CARTER BARRETT

Site : ----

Quote number : CG21-FARU100-0002

No. of samples received : 3

No. of samples analysed : 3

Page : 1 of 6

Laboratory : Calgary - Environmental

Account Manager : Patryk Wojciak

Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5

Telephone : +1 403 407 1800

Date Samples Received : 16-Sep-2022 08:55

Date Analysis Commenced : 16-Sep-2022

Issue Date : 23-Sep-2022 16:13

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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sunil Palak		Calgary Microbiology, Calgary, Alberta

Page : 2 of 6
Work Order : CG2212589
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - Fall EMS week 3



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 650767)											
CG2212578-001	Anonymous	pH	----	E108	0.10	pH units	7.72	7.76	0.517%	4%	----
Physical Tests (QC Lot: 654075)											
CG2212607-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	28.3	27.1	1.2	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 650790)											
CG2212561-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	6.96	6.95	0.155%	20%	----
Anions and Nutrients (QC Lot: 650791)											
CG2212561-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0011	0.0011	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 651016)											
CG2212573-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0100	mg/L	0.643	0.643	0.0871%	20%	----
Anions and Nutrients (QC Lot: 653699)											
CG2212573-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	0.643	0.642	0.108%	20%	----
Anions and Nutrients (QC Lot: 653701)											
CG2212573-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.410	0.407	0.612%	20%	----
Microbiological Tests (QC Lot: 653466)											
CG2212546-001	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	60	54	10.5%	65%	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 654075)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 650790)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 650791)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 651016)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 653699)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 653701)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Microbiological Tests (QCLot: 653466)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 650767)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 654075)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	97.1	85.0	115	----
Anions and Nutrients (QCLot: 650790)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 650791)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 651016)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	94.5	80.0	120	----
Anions and Nutrients (QCLot: 653699)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	91.9	80.0	120	----
Anions and Nutrients (QCLot: 653701)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.4	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 650790)										
CG2212595-003	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.52 mg/L	2.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 650791)										
CG2212595-003	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.511 mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 651016)										
CG2212578-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0495 mg/L	0.05 mg/L	99.0	70.0	130	----
Anions and Nutrients (QCLot: 653699)										
CG2212589-001	ELK RIVER UPSTREAM	phosphorus, total	7723-14-0	E372-U	0.0486 mg/L	0.05 mg/L	97.2	70.0	130	----
Anions and Nutrients (QCLot: 653701)										
CG2212589-001	ELK RIVER UPSTREAM	ammonia, total (as N)	7664-41-7	E298	0.101 mg/L	0.1 mg/L	101	75.0	125	----



CERTIFICATE OF ANALYSIS

Work Order : **CG2212960**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - Fall EMS week 4
PO : ----
C-O-C number : ----
Sampler : CB
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 22-Sep-2022 08:58
Date Analysis Commenced : 22-Sep-2022
Issue Date : 14-Oct-2022 15:13

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Catherine Fong	Lab Analyst	Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Workorder Comments

No bacteria bottle was found for CG2212960-002 (WWTP Effluent) - Fecal bacteria code delted



Analytical Results

Sub-Matrix: Water					Client sample ID	WWTP INFLUENT	WWTP EFFLUENT	ELK RIVER UPSTREAM	ELK RIVER @ OUTFALL	ELK RIVER DOWNSTREAM
(Matrix: Water)					Client sampling date / time	21-Sep-2022 10:00	21-Sep-2022 10:00	21-Sep-2022 10:15	21-Sep-2022 10:25	21-Sep-2022 10:45
Analyte	CAS Number	Method	LOR	Unit	CG2212960-001	CG2212960-002	CG2212960-003	CG2212960-004	CG2212960-005	
					Result	Result	Result	Result	Result	
Physical Tests										
pH	----	E108	0.10	pH units	7.88	8.00	8.28	8.34	8.31	
solids, total suspended [TSS]	----	E160	3.0	mg/L	78.9	<3.0	<3.0	<3.0	<3.0	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0163	0.0082	0.0091	0.0182	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	24.2	1.99	6.31	1.99	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	0.0144	0.0025	0.0212	0.0028	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	0.113	<0.0010	0.0201	<0.0010	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.132	0.0030	0.0384	0.0027	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	24.2	1.99	6.33	1.99	
Microbiological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	----	1	<1	1	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	34.6	<2.0	----	----	----	
chemical oxygen demand [COD]	----	E559-L	10	mg/L	----	<10	<10	<10	<10	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2212960	Page	: 1 of 10
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - Fall EMS week 4	Date Samples Received	: 22-Sep-2022 08:58
PO	: ----	Issue Date	: 14-Oct-2022 15:13
C-O-C number	: ----		
Sampler	: CB		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-48h] WWTP EFFLUENT	E550	21-Sep-2022	----	----	----		23-Sep-2022	48 hrs	47 hrs	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-48h] WWTP INFLUENT	E550	21-Sep-2022	----	----	----		23-Sep-2022	48 hrs	47 hrs	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E559-L	21-Sep-2022	----	----	----		22-Sep-2022	28 days	1 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E559-L	21-Sep-2022	----	----	----		22-Sep-2022	28 days	1 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E559-L	21-Sep-2022	----	----	----		22-Sep-2022	28 days	1 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E559-L	21-Sep-2022	----	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E298	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E298	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E298	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001											
HDPE ELK RIVER @ OUTFALL	E378-U	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001											
HDPE ELK RIVER DOWNSTREAM	E378-U	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001											
HDPE ELK RIVER UPSTREAM	E378-U	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001											
HDPE WWTP EFFLUENT	E378-U	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER @ OUTFALL	E235.NO3-L	21-Sep-2022	23-Sep-2022	3 days	2 days	✔	23-Sep-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO3-L	21-Sep-2022	23-Sep-2022	3 days	2 days	✔	23-Sep-2022	3 days	0 days	✔	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO3-L	21-Sep-2022	23-Sep-2022	3 days	2 days	✓	23-Sep-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO3-L	21-Sep-2022	23-Sep-2022	3 days	2 days	✓	23-Sep-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER @ OUTFALL	E235.NO2-L	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO2-L	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO2-L	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE WWTP EFFLUENT	E235.NO2-L	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E372-U	21-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E372-U	21-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E372-U	21-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	21-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER @ OUTFALL	E012.FC	21-Sep-2022	----	----	----		22-Sep-2022	30 hrs	26 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER DOWNSTREAM	E012.FC	21-Sep-2022	----	----	----		22-Sep-2022	30 hrs	26 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER UPSTREAM	E012.FC	21-Sep-2022	----	----	----		22-Sep-2022	30 hrs	27 hrs	✓	
Physical Tests : pH by Meter											
HDPE ELK RIVER @ OUTFALL	E108	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER DOWNSTREAM	E108	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER UPSTREAM	E108	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP EFFLUENT	E108	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP INFLUENT	E108	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	* EHTR-FM	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER @ OUTFALL	E160	21-Sep-2022	----	----	----		27-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER DOWNSTREAM	E160	21-Sep-2022	----	----	----		27-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER UPSTREAM	E160	21-Sep-2022	----	----	----		27-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	21-Sep-2022	----	----	----		27-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	21-Sep-2022	----	----	----		27-Sep-2022	7 days	6 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	662591	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	663330	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	661021	2	39	5.1	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	662041	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	662759	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	662760	1	20	5.0	5.0	✔
pH by Meter	E108	665048	2	36	5.5	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	665739	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	666375	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	665116	1	20	5.0	5.0	✔
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	662591	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	663330	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	661021	2	39	5.1	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	662041	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	662759	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	662760	1	20	5.0	5.0	✔
pH by Meter	E108	665048	2	36	5.5	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	666375	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	665116	1	20	5.0	5.0	✔
Method Blanks (MB)							
Ammonia by Fluorescence	E298	662591	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	663330	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	661021	2	39	5.1	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	662041	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	662759	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	662760	1	20	5.0	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	665739	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	666375	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	665116	1	20	5.0	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	662591	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	661021	2	39	5.1	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	662041	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	662759	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	662760	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	666375	1	20	5.0	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : **CG2212960**
Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - Fall EMS week 4
PO : ----
C-O-C number : ----
Sampler : CB
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 6
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 22-Sep-2022 08:58
Date Analysis Commenced : 22-Sep-2022
Issue Date : 14-Oct-2022 15:13

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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Catherine Fong	Lab Analyst	Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sunil Palak		Calgary Microbiology, Calgary, Alberta

Page : 2 of 6
Work Order : CG2212960
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - Fall EMS week 4



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 665045)											
CG2212940-001	Anonymous	pH	----	E108	0.10	pH units	7.85	7.89	0.508%	4%	----
Physical Tests (QC Lot: 665048)											
CG2212960-004	ELK RIVER @ OUTFALL	pH	----	E108	0.10	pH units	8.34	8.37	0.359%	4%	----
Physical Tests (QC Lot: 665116)											
CG2212930-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	289	283	2.17%	20%	----
Anions and Nutrients (QC Lot: 662041)											
CG2212950-007	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 662591)											
CG2212950-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0108	0.0096	0.0012	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 662759)											
CG2213062-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 662760)											
CG2213062-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0010	0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 666375)											
CG2212950-008	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0247	0.0230	7.13%	20%	----
Microbiological Tests (QC Lot: 665739)											
CG2212963-002	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	2	CFU/100mL	8	6	28.6%	65%	----
Aggregate Organics (QC Lot: 661021)											
CG2212925-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	236	233	1.14%	20%	----
Aggregate Organics (QC Lot: 662420)											
CG2212960-005	ELK RIVER DOWNSTREAM	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 663330)											
CG2212958-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

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

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 665116)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 662041)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 662591)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 662759)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 662760)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 666375)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 665739)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 661021)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 662420)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 663330)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 665045)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 665048)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 665116)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 662041)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	88.8	80.0	120	----
Anions and Nutrients (QCLot: 662591)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 662759)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 662760)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	95.1	90.0	110	----
Anions and Nutrients (QCLot: 666375)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	95.7	80.0	120	----
Aggregate Organics (QCLot: 661021)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	99.5	85.0	115	----
Aggregate Organics (QCLot: 662420)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	102	85.0	115	----
Aggregate Organics (QCLot: 663330)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	94.5	85.0	115	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 662041)										
CG2212950-008	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0426 mg/L	0.05 mg/L	85.3	70.0	130	----
Anions and Nutrients (QCLot: 662591)										
CG2212950-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.107 mg/L	0.1 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 662759)										
CG2213073-003	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.46 mg/L	2.5 mg/L	98.2	75.0	125	----
Anions and Nutrients (QCLot: 662760)										
CG2213073-003	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.499 mg/L	0.5 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 666375)										
CG2212950-009	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Aggregate Organics (QCLot: 661021)										
CG2212925-002	Anonymous	chemical oxygen demand [COD]	----	E559-L	99 mg/L	100 mg/L	99.0	75.0	125	----
Aggregate Organics (QCLot: 662420)										
CG2212960-005	ELK RIVER DOWNSTREAM	chemical oxygen demand [COD]	----	E559-L	104 mg/L	100 mg/L	104	75.0	125	----

ALS Environmental

ANALYTICAL CHEMISTRY & TESTING SERVICES

www.alsenviro.com



Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 8585 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-868-9878 Fax: 780-513-2191
 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1588
 Edmonton AB, 9936 - 67th Avenue, T5E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

Environmental Division
 Calgary
 Work Order Reference
CG2212960



Telephone: +1 403 407 1800

SEND REPORT TO:

CHAIN OF CUSTODY FORM

COMPANY:		FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN:	PATRICK MAJER	ANALYSIS REQUESTED:										
ADDRESS:		1505 - 17TH AVENUE SOUTH WEST														
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2											
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Carter Barrett											
PROJECT NAME AND NO.:		FARUC - Fall EMS week 4			QUOTE NO.:											
PO NO.:		ALS CONTACT:	Patrik Woyciak													
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: <u>pmajer@skircf.com</u> <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:															
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	PH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)	
		YYYY-MM-DD	TIME													
FOR LAB USE ONLY	1	WWTP Influent Routine	2022-09-21	10:00	Water		X	X								
		WWTP Influent BOD	2022-09-21	10:00	Water								X			
	2	WWTP Effluent Routine	2022-09-21	10:00	Water		X	X							X	
		WWTP Effluent BOD	2022-09-21	10:00	Water								X			
		WWTP Effluent Nutrients	2022-09-21	10:00	Water				X	X	X	X	X			
		WWTP Effluent Bacteriological	2022-09-21	10:00	Water	X										
	3	Elk River Upstream Routine	2022-09-21	10:15	Water		X	X								
		Elk River Upstream Nutrients	2022-09-21	10:15	Water				X	X	X	X	X			
		Elk River Upstream Bacteriological	2022-09-21	10:15	Water	X										
	4	Elk River @ Outfall Routine	2022-09-21	10:25	Water		X	X								
		Elk River @ Outfall Nutrients	2022-09-21	10:25	Water				X	X	X	X	X			
		Elk River @ Outfall Bacteriological	2022-09-21	10:25	Water	X										
	5	Elk River Downstream Routine	2022-09-21	10:45	Water		X	X								
		Elk River Downstream Nutrients	2022-09-21	10:45	Water				X	X	X	X	X			
		Elk River Downstream Bacteriological	2022-09-21	10:45	Water	X										
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)				RELINQUISHED BY:	DATE:	Sept 21/22	RECEIVED BY:	DATE:	22/09/22					
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)				Carter Barrett	TIME:	11:15	NC	TIME:	0658					
INVOICE FORMAT:		<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX				RELINQUISHED BY:	DATE:		RECEIVED BY:	DATE:						
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com				FOR LAB USE ONLY										
		Cooler Seal Intact?		Sample Temperature: 10 °C		Frozen? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Cooling Method? icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None <input type="checkbox"/>								
		Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>														

Environmental Division
 Calgary
 Work Order Reference
CG2212960



CERTIFICATE OF ANALYSIS

Work Order	: CG2213385	Page	: 1 of 4
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - Fall EMS week 5	Date Samples Received	: 29-Sep-2022 09:00
PO	: ----	Date Analysis	: 29-Sep-2022
C-O-C number	: ----	Commenced	
Sampler	: CB	Issue Date	: 05-Oct-2022 11:45
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

CG2213385-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: ELK RIVER UPSTREAM

Client sampling date / time: 28-Sep-2022 10:30

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.28	0.10	pH units	E108	03-Oct-2022	03-Oct-2022	677373
solids, total suspended [TSS]	----	4.0	3.0	mg/L	E160	-	02-Oct-2022	674476
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0057	0.0050	mg/L	E298	29-Sep-2022	29-Sep-2022	673031
nitrate (as N)	14797-55-8	2.15	0.0050	mg/L	E235.NO3-L	29-Sep-2022	29-Sep-2022	673110
nitrite (as N)	14797-65-0	0.0039	0.0010	mg/L	E235.NO2-L	29-Sep-2022	29-Sep-2022	673109
phosphate, ortho-, dissolved (as P)	14265-44-2	<0.0010	0.0010	mg/L	E378-U	29-Sep-2022	29-Sep-2022	673180
phosphorus, total	7723-14-0	0.0066	0.0020	mg/L	E372-U	30-Sep-2022	03-Oct-2022	673972
nitrate + nitrite (as N)	----	2.15	0.0051	mg/L	EC235.N+N	-	04-Oct-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	1	1	CFU/100mL	E012.FC	-	29-Sep-2022	674816

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

Analytical Results

CG2213385-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: ELK RIVER @ OUTFALL

Client sampling date / time: 28-Sep-2022 10:40

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.20	0.10	pH units	E108	03-Oct-2022	03-Oct-2022	677373
solids, total suspended [TSS]	----	3.4	3.0	mg/L	E160	-	02-Oct-2022	674476
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0112	0.0050	mg/L	E298	29-Sep-2022	29-Sep-2022	673031
nitrate (as N)	14797-55-8	12.0	0.0050	mg/L	E235.NO3-L	29-Sep-2022	29-Sep-2022	673110
nitrite (as N)	14797-65-0	0.0284	0.0010	mg/L	E235.NO2-L	29-Sep-2022	29-Sep-2022	673109
phosphate, ortho-, dissolved (as P)	14265-44-2	0.130 ^{DLHC}	0.0020	mg/L	E378-U	29-Sep-2022	29-Sep-2022	673180
phosphorus, total	7723-14-0	0.136	0.0200	mg/L	E372-U	30-Sep-2022	03-Oct-2022	673972
nitrate + nitrite (as N)	----	12.0	0.0051	mg/L	EC235.N+N	-	04-Oct-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	<1	1	CFU/100mL	E012.FC	-	29-Sep-2022	674816

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

Analytical Results

CG2213385-003

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: ELK RIVER DOWNSTREAM

Client sampling date / time: 28-Sep-2022 10:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.26	0.10	pH units	E108	03-Oct-2022	03-Oct-2022	677373
solids, total suspended [TSS]	----	4.2	3.0	mg/L	E160	-	02-Oct-2022	674476
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0093	0.0050	mg/L	E298	29-Sep-2022	29-Sep-2022	673031



Analytical Results

CG2213385-003

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID: ELK RIVER DOWNSTREAM

Client sampling date / time: 28-Sep-2022 10:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients								
nitrate (as N)	14797-55-8	2.17	0.0050	mg/L	E235.NO3-L	29-Sep-2022	29-Sep-2022	673110
nitrite (as N)	14797-65-0	0.0029	0.0010	mg/L	E235.NO2-L	29-Sep-2022	29-Sep-2022	673109
phosphate, ortho-, dissolved (as P)	14265-44-2	<0.0010	0.0010	mg/L	E378-U	29-Sep-2022	29-Sep-2022	673180
phosphorus, total	7723-14-0	0.0040	0.0020	mg/L	E372-U	30-Sep-2022	03-Oct-2022	673972
nitrate + nitrite (as N)	----	2.17	0.0051	mg/L	EC235.N+N	-	04-Oct-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	1	1	CFU/100mL	E012.FC	-	29-Sep-2022	674816

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2213385	Page	: 1 of 8
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - Fall EMS week 5	Date Samples Received	: 29-Sep-2022 09:00
PO	: ----	Issue Date	: 05-Oct-2022 11:45
C-O-C number	: ----		
Sampler	: CB		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E298	28-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E298	28-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E298	28-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE ELK RIVER @ OUTFALL	E378-U	28-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE ELK RIVER DOWNSTREAM	E378-U	28-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE ELK RIVER UPSTREAM	E378-U	28-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	3 days	1 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER @ OUTFALL	E235.NO3-L	28-Sep-2022	29-Sep-2022	3 days	1 days	✓	29-Sep-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO3-L	28-Sep-2022	29-Sep-2022	3 days	1 days	✓	29-Sep-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO3-L	28-Sep-2022	29-Sep-2022	3 days	1 days	✓	29-Sep-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER @ OUTFALL	E235.NO2-L	28-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER DOWNSTREAM	E235.NO2-L	28-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE ELK RIVER UPSTREAM	E235.NO2-L	28-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	3 days	1 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E372-U	28-Sep-2022	30-Sep-2022	----	----		03-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E372-U	28-Sep-2022	30-Sep-2022	----	----		03-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E372-U	28-Sep-2022	30-Sep-2022	----	----		03-Oct-2022	28 days	5 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER DOWNSTREAM	E012.FC	28-Sep-2022	----	----	----		29-Sep-2022	30 hrs	26 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER @ OUTFALL	E012.FC	28-Sep-2022	----	----	----		29-Sep-2022	30 hrs	27 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) ELK RIVER UPSTREAM	E012.FC	28-Sep-2022	----	----	----		29-Sep-2022	30 hrs	27 hrs	✓	
Physical Tests : pH by Meter											
HDPE ELK RIVER @ OUTFALL	E108	28-Sep-2022	03-Oct-2022	----	----		03-Oct-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER DOWNSTREAM	E108	28-Sep-2022	03-Oct-2022	----	----		03-Oct-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE ELK RIVER UPSTREAM	E108	28-Sep-2022	03-Oct-2022	----	----		03-Oct-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER @ OUTFALL	E160	28-Sep-2022	----	----	----		02-Oct-2022	7 days	4 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER DOWNSTREAM	E160	28-Sep-2022	----	----	----		02-Oct-2022	7 days	4 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE ELK RIVER UPSTREAM	E160	28-Sep-2022	----	----	----		02-Oct-2022	7 days	4 days	✓	

Legend & Qualifier Definitions

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

Page : 6 of 8
Work Order : CG2213385
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - Fall EMS week 5



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



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	673031	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	673180	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	673110	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	673109	1	20	5.0	5.0	✓
pH by Meter	E108	677373	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	674816	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	673972	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	674476	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	673031	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	673180	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	673110	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	673109	1	20	5.0	5.0	✓
pH by Meter	E108	677373	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	673972	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	674476	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	673031	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	673180	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	673110	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	673109	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	674816	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	673972	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	674476	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	673031	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	673180	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	673110	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	673109	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	673972	1	20	5.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



QUALITY CONTROL REPORT

Work Order : **CG2213385**
Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - Fall EMS week 5
PO : ----
C-O-C number : ----
Sampler : CB
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 6
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 29-Sep-2022 09:00
Date Analysis Commenced : 29-Sep-2022
Issue Date : 05-Oct-2022 11:45

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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sunil Palak		Calgary Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

Page : 2 of 6
Work Order : CG2213385
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - Fall EMS week 5



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 674476)											
CG2213310-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	372	354	4.96%	20%	----
Physical Tests (QC Lot: 677373)											
CG2213318-001	Anonymous	pH	----	E108	0.10	pH units	9.97	9.98	0.100%	4%	----
Anions and Nutrients (QC Lot: 673031)											
CG2213385-001	ELK RIVER UPSTREAM	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0057	<0.0050	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 673109)											
CG2213402-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0200	mg/L	0.756	0.769	1.72%	20%	----
Anions and Nutrients (QC Lot: 673110)											
CG2213402-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.100	mg/L	220	223	1.24%	20%	----
Anions and Nutrients (QC Lot: 673180)											
CG2213385-001	ELK RIVER UPSTREAM	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 673972)											
CG2213318-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	0.476	0.477	0.257%	20%	----
Microbiological Tests (QC Lot: 674816)											
CG2213304-001	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	1	1	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 674476)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 673031)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 673109)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 673110)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 673180)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 673972)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 674816)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 674476)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	97.3	85.0	115	----
Physical Tests (QCLot: 677373)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Anions and Nutrients (QCLot: 673031)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 673109)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 673110)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 673180)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	107	80.0	120	----
Anions and Nutrients (QCLot: 673972)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	97.6	80.0	120	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 673031)										
CG2213385-002	ELK RIVER @ OUTFALL	ammonia, total (as N)	7664-41-7	E298	0.104 mg/L	0.1 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 673109)										
CG2213402-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.532 mg/L	0.5 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 673110)										
CG2213402-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.68 mg/L	2.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 673180)										
CG2213385-002	ELK RIVER @ OUTFALL	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 673972)										
CG2213336-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0494 mg/L	0.05 mg/L	98.9	70.0	130	----



Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 Fax: 780-513-2191
 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 Edmonton AB, 9938 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0111
 Saskatoon SK, B19 - 58th Street East, S7K 6X5, Tel: 308-668-8370 Toll Free: 1-800-667-7645 Fax: 308-888-8383

Environmental Division
 Calgary
 Work Order Reference
CG2213385



Telephone : +1 403 407 1800

SEND REPORT TO:

CHAIN OF CUSTODY FORM

COMPANY:		FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:										
ADDRESS:		1505 - 17TH AVENUE SOUTH WEST														
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2											
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Carter Barrett											
PROJECT NAME AND NO.:		FARUC - Fall EMS week 5			QUOTE NO.:											
PO NO.:		ALS CONTACT: Patryk Woyciak														
REPORT FORMAT:		<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmaier@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:														
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due date)	
		YYYY-MM-DD	TIME													
FOR LAB USE ONLY	Elk River Upstream Routine	2022-09-28	10:30	Water		X	X									
	Elk River Upstream Nutrients	2022-09-28	10:30	Water				X	X	X	X	X				
	Elk River Upstream Bacteriological	2022-09-28	10:30	Water	X											
	Elk River @ Outfall Routine	2022-09-28	10:40	Water		X	X									
	Elk River @ Outfall Nutrients	2022-09-28	10:40	Water				X	X	X	X	X				
	Elk River @ Outfall Bacteriological	2022-09-28	10:40	Water	X											
	Elk River Downstream Routine	2022-09-28	10:50	Water		X	X									
	Elk River Downstream Nutrients	2022-09-28	10:50	Water				X	X	X	X	X				
	Elk River Downstream Bacteriological	2022-09-28	10:50	Water	X											
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)				RELINQUISHED BY:		DATE:	2022/09/28	RECEIVED BY:		DATE:	29/SEP/22			
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)				Carter Barrett		TIME:	11:15	NC		TIME:	09:00			
INVOICE FORMAT:		<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX						DATE:		RECEIVED BY:		DATE:				
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com						TIME:				TIME:				
FOR LAB USE ONLY																
Cooler Seal Intact?				Sample Temperature: 8 °C				Cooling Method?								
Yes ___ No ___ N/A				Frozen? Yes ___ No ___ X				Icepacks ___ Ice ___ None ___								

Environmental Division
 Calgary
 Work Order Reference
CG2213385

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Environmental Division

COLIFORM SAMPLE DECLARATION FORM

In British Columbia, the *Drinking Water Protection Act* requires laboratories to immediately report **positive results for Fecal Coliform and *Escherichia coli*** in drinking water samples directly to the Water Supplier, the Drinking Water Officer, and the Medical Health Officer in the region the water samples were taken. Immediate reporting is not required if the sample is water for which a public advisory to boil for drinking water has been issued, or if the sample is not a drinking water.

A. PLEASE complete and sign this Declaration for EVERY sample or sample batch submitted to ALS Environmental for Coliform and/or *Escherichia coli* analysis.

ARE the sample(s) submitted herein Drinking Water Samples? YES NO
(A drinking water sample is any water sample intended for human consumption.)

STOP HERE IF YOU ANSWERED NO, AND PLEASE SIGN AND DATE BELOW.
Please submit samples by 1:00 pm Monday to Friday, or contact ALSE to make other arrangements.

B. Please complete this section ONLY if samples are Drinking Water (DW) Sample(s).

THIS COLUMN FOR LAB USE ONLY ALS SAMPLE #	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED				INDIVIDUAL SAMPLE DECLARATION (Please select yes or no from drop down menu)	
		Y	M	D	24 Hour Time	Sample Subject to BC DW Protection Act? ¹	Boil Water Advisory in Effect?
	Tamarak Building	22	09	28	10:50	Yes	No
	Snow Creek Lodge	22	09	28	11:00	Yes	No
						Yes	No
						Yes	No
						Yes	No
						Yes	No
						Yes	No

¹ Samples are subject to the BC Drinking Water Protection Act only if the water supply system serves more than one single-family dwelling. Please contact your regional health officer if you are unsure whether this applies to your sample(s).

Carter Barrett
Name (Please print)
Carter B
Signature

Operator
Title
Sept 28, 2022
Date

TURN OVER TO COMPLETE



COLIFORM SAMPLE DECLARATION FORM (Page 2 of 2)

C. Please complete this section ONLY if samples are Drinking Water Sample(s).

Company, Water System Name or Name of Home Owner: FERNIE ALPINE RESORT UTILITIES CORP.			
Address: 1505-17th AVE SW CALGARY	Phone No: (403) 256 8473	Fax No: (403) 244 3774	After Hours/Emergency No: (403) 861 8730
Water Supplier ² : PATRICK MAJER	Phone No: (403) 256 8473	Fax No: (403) 244 3774	After Hours/Emergency No: (403) 861 8730
Sampler/Submitter ³ : Carter Barrett / Claudia Heinrich	Phone No: (306) 861-7001	Fax No: ()	

² Person to whom results should be sent.

³ Sampler or submitter of samples if different than Water Supplier.

D. Please complete this section ONLY if samples are subject to regulation under the Drinking Water Protection Act.

Health Authority Region and/or Service Area ⁴ : INTERIOR HEALTH			
Drinking Water Officer Name: DAN BYRON	Phone No: (250) 420 2240	Fax No: ()	After Hours/Emergency No: (250) 421 3471
Medical Health Officer Name:	Phone No: ()	Fax No: ()	After Hours/Emergency No: (866) 457 5648

⁴ There are five B.C. Health Authority Regions and 16 associated Health Service Delivery Areas:

- 1. Northern: Northwest, Northeast and Northern Interior
- 2. Interior: East Kootenay, Kootenay/Boundary, Okanagan and Thompson/Cariboo
- 3. Vancouver Island: North Vancouver Island, Central Vancouver Island and South Vancouver Island
- 4. Vancouver Coastal: North Shore / Coast Garibaldi, Vancouver and Richmond
- 5. Fraser: Fraser North, Fraser South and Fraser East

E. This section for lab use only.

Received By:	Date:	Time: AM PM
Sample Temperature Upon Receipt:	COOLING METHOD: ICEPACKS <input type="checkbox"/> ICE <input type="checkbox"/> NONE <input type="checkbox"/>	



CERTIFICATE OF ANALYSIS

Work Order	: CG2213834	Page	: 1 of 4
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - Fall EMS week 6	Date Samples Received	: 06-Oct-2022 09:20
PO	: ----	Date Analysis	: 06-Oct-2022
		Commenced	
C-O-C number	: ----	Issue Date	: 13-Oct-2022 14:00
Sampler	: Carter Barrett		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

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

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

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



Analytical Results

CG2213834-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Elk River Upstream

Client sampling date / time: 05-Oct-2022 10:30

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.39	0.10	pH units	E108	09-Oct-2022	09-Oct-2022	688407
solids, total suspended [TSS]	----	3.5	3.0	mg/L	E160	-	12-Oct-2022	687540
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0118	0.0050	mg/L	E298	06-Oct-2022	06-Oct-2022	684800
nitrate (as N)	14797-55-8	2.14	0.0050	mg/L	E235.NO3-L	06-Oct-2022	06-Oct-2022	684254
nitrite (as N)	14797-65-0	0.0024	0.0010	mg/L	E235.NO2-L	06-Oct-2022	06-Oct-2022	684255
phosphate, ortho-, dissolved (as P)	14265-44-2	0.0021	0.0010	mg/L	E378-U	06-Oct-2022	06-Oct-2022	684395
phosphorus, total	7723-14-0	0.0052	0.0020	mg/L	E372-U	12-Oct-2022	13-Oct-2022	691548
nitrate + nitrite (as N)	----	2.14	0.0051	mg/L	EC235.N+N	-	11-Oct-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	2	1	CFU/100mL	E012.FC	-	06-Oct-2022	686538
Aggregate Organics								
chemical oxygen demand [COD]	----	<10	10	mg/L	E559-L	-	07-Oct-2022	685674

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

Analytical Results

CG2213834-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Elk River @Outfall

Client sampling date / time: 05-Oct-2022 10:30

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.39	0.10	pH units	E108	09-Oct-2022	09-Oct-2022	688407
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	12-Oct-2022	687540
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0156	0.0050	mg/L	E298	06-Oct-2022	06-Oct-2022	684800
nitrate (as N)	14797-55-8	10.6	0.0050	mg/L	E235.NO3-L	06-Oct-2022	06-Oct-2022	684254
nitrite (as N)	14797-65-0	0.0188	0.0010	mg/L	E235.NO2-L	06-Oct-2022	06-Oct-2022	684255
phosphate, ortho-, dissolved (as P)	14265-44-2	0.0547	0.0010	mg/L	E378-U	06-Oct-2022	06-Oct-2022	684395
phosphorus, total	7723-14-0	0.0627	0.0020	mg/L	E372-U	12-Oct-2022	13-Oct-2022	691548
nitrate + nitrite (as N)	----	10.6	0.0051	mg/L	EC235.N+N	-	11-Oct-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	2	1	CFU/100mL	E012.FC	-	06-Oct-2022	686538
Aggregate Organics								
chemical oxygen demand [COD]	----	<10	10	mg/L	E559-L	-	07-Oct-2022	685674

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

Analytical Results

CG2213834-003

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Elk River Downstream

Client sampling date / time: 05-Oct-2022 10:30

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								



Analytical Results

CG2213834-003

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID: Elk River Downstream

Client sampling date / time: 05-Oct-2022 10:30

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.40	0.10	pH units	E108	09-Oct-2022	09-Oct-2022	688407
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	12-Oct-2022	687540
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	<0.0050	0.0050	mg/L	E298	06-Oct-2022	06-Oct-2022	684800
nitrate (as N)	14797-55-8	2.14	0.0050	mg/L	E235.NO3-L	06-Oct-2022	06-Oct-2022	684254
nitrite (as N)	14797-65-0	0.0024	0.0010	mg/L	E235.NO2-L	06-Oct-2022	06-Oct-2022	684255
phosphate, ortho-, dissolved (as P)	14265-44-2	0.0019	0.0010	mg/L	E378-U	06-Oct-2022	06-Oct-2022	684395
phosphorus, total	7723-14-0	0.0032	0.0020	mg/L	E372-U	12-Oct-2022	13-Oct-2022	691548
nitrate + nitrite (as N)	----	2.14	0.0051	mg/L	EC235.N+N	-	11-Oct-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	<1	1	CFU/100mL	E012.FC	-	06-Oct-2022	686538
Aggregate Organics								
chemical oxygen demand [COD]	----	<10	10	mg/L	E559-L	-	07-Oct-2022	685674

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: CG2213834	Page	: 1 of 9
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - Fall EMS week 6	Date Samples Received	: 06-Oct-2022 09:20
PO	: ----	Issue Date	: 13-Oct-2022 14:00
C-O-C number	: ----		
Sampler	: Carter Barrett		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Elk River @Outfall	E559-L	05-Oct-2022	----	----	----		07-Oct-2022	28 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Elk River Downstream	E559-L	05-Oct-2022	----	----	----		07-Oct-2022	28 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Elk River Upstream	E559-L	05-Oct-2022	----	----	----		07-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River @Outfall	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River Downstream	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River Upstream	E298	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE Elk River @Outfall	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE Elk River Downstream	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE Elk River Upstream	E378-U	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Elk River @Outfall	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Elk River Downstream	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Elk River Upstream	E235.NO3-L	05-Oct-2022	06-Oct-2022	3 days	1 days	✓	06-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Elk River @Outfall	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Elk River Downstream	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Elk River Upstream	E235.NO2-L	05-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) Elk River @Outfall	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) Elk River Downstream	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) Elk River Upstream	E372-U	05-Oct-2022	12-Oct-2022	----	----		13-Oct-2022	28 days	8 days	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River @Outfall	E012.FC	05-Oct-2022	----	----	----		06-Oct-2022	30 hrs	28 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River Downstream	E012.FC	05-Oct-2022	----	----	----		06-Oct-2022	30 hrs	28 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River Upstream	E012.FC	05-Oct-2022	----	----	----		06-Oct-2022	30 hrs	28 hrs	✓	
Physical Tests : pH by Meter											
HDPE Elk River @Outfall	E108	05-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Elk River Downstream	E108	05-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Elk River Upstream	E108	05-Oct-2022	09-Oct-2022	----	----		09-Oct-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE Elk River @Outfall	E160	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✓	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE Elk River Downstream	E160	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✔
Physical Tests : TSS by Gravimetry										
HDPE Elk River Upstream	E160	05-Oct-2022	----	----	----		12-Oct-2022	7 days	7 days	✔

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	684800	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	685674	1	14	7.1	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684395	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	684254	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	684255	1	19	5.2	5.0	✔
pH by Meter	E108	688407	1	20	5.0	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	686538	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	691548	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	687540	1	20	5.0	5.0	✔
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	684800	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	685674	1	14	7.1	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684395	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	684254	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	684255	1	19	5.2	5.0	✔
pH by Meter	E108	688407	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	691548	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	687540	1	20	5.0	5.0	✔
Method Blanks (MB)							
Ammonia by Fluorescence	E298	684800	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	685674	1	14	7.1	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684395	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	684254	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	684255	1	19	5.2	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	686538	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	691548	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	687540	1	20	5.0	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	684800	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	685674	1	14	7.1	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	684395	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	684254	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	684255	1	19	5.2	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	691548	1	20	5.0	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

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Work Order : CG2213834
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - Fall EMS week 6



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
	Calgary - Environmental			



QUALITY CONTROL REPORT

Work Order : **CG2213834**

Client : Fernie Alpine Resort Utilities Corporation

Contact : Patrick Majer

Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2

Telephone : 403 254 7669

Project : FARUC - Fall EMS week 6

PO : ----

C-O-C number : ----

Sampler : Carter Barrett

Site : ----

Quote number : CG21-FARU100-0002

No. of samples received : 3

No. of samples analysed : 3

Page : 1 of 6

Laboratory : Calgary - Environmental

Account Manager : Patryk Wojciak

Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5

Telephone : +1 403 407 1800

Date Samples Received : 06-Oct-2022 09:20

Date Analysis Commenced : 06-Oct-2022

Issue Date : 13-Oct-2022 14:00

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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
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Page : 2 of 6
Work Order : CG2213834
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - Fall EMS week 6



General Comments

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

Key :

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

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

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

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

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 687540)											
CG2213708-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	12.3	14.7	2.4	Diff <2x LOR	----
Physical Tests (QC Lot: 688407)											
CG2213773-011	Anonymous	pH	----	E108	0.10	pH units	7.60	7.61	0.131%	4%	----
Anions and Nutrients (QC Lot: 684254)											
CG2213841-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	48.2	48.6	0.680%	20%	----
Anions and Nutrients (QC Lot: 684255)											
CG2213841-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0095	0.0101	0.0006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 684395)											
CG2213784-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 684800)											
CG2213834-001	Elk River Upstream	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0118	0.0064	0.0054	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 691548)											
CG2213766-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.200	mg/L	7.35	7.49	1.92%	20%	----
Microbiological Tests (QC Lot: 686538)											
CG2213756-001	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	3	2	1	Diff <2x LOR	----
Aggregate Organics (QC Lot: 685674)											
CG2213834-001	Elk River Upstream	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 687540)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 684254)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 684255)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 684395)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 684800)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 691548)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 686538)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 685674)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 687540)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	101	85.0	115	----
Physical Tests (QCLot: 688407)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Anions and Nutrients (QCLot: 684254)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 684255)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 684395)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	106	80.0	120	----
Anions and Nutrients (QCLot: 684800)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 691548)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	95.3	80.0	120	----
Aggregate Organics (QCLot: 685674)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	105	85.0	115	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1x$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 684254)										
CG2213841-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	ND mg/L	2.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 684255)										
CG2213841-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.463 mg/L	0.5 mg/L	92.6	75.0	125	----
Anions and Nutrients (QCLot: 684395)										
CG2213784-003	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0522 mg/L	0.05 mg/L	104	70.0	130	----
Anions and Nutrients (QCLot: 684800)										
CG2213834-002	Elk River @Outfall	ammonia, total (as N)	7664-41-7	E298	0.105 mg/L	0.1 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 691548)										
CG2213766-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0423 mg/L	0.05 mg/L	84.6	70.0	130	----
Aggregate Organics (QCLot: 685674)										
CG2213834-002	Elk River @Outfall	chemical oxygen demand [COD]	----	E559-L	104 mg/L	100 mg/L	104	75.0	125	----



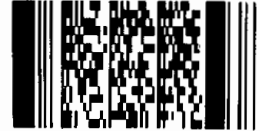
SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE 1 OF 1

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:												
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST																
CITY: CALGARY	PROV: ALBERTA	POSTAL CODE: T2T 0E2														
TEL: 403 - 256 - 8473	FAX: 403 - 244 - 3774	SAMPLER: Carter Barrett														
PROJECT NAME AND NO.: FARUC - Fall EMS week 6		QUOTE NO:														
PO NO.:	ALS CONTACT: Patyk Woyciak															
REPORT FORMAT: <input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS majer@skircr.com																
<input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:																
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)	
		YYYY-MM-DD	TIME													
FOR LAB USE ONLY	11) Elk River Upstream Routine	2022-10-05	10:30	Water		X	X									
	Elk River Upstream Nutrients	2022-10-05	10:30	Water				X	X	X	X	X				
	Elk River Upstream Bacteriological	2022-10-05	10:30	Water	X											
	2) Elk River @ Outfall Routine	2022-10-05	10:40	Water		X	X									
	Elk River @ Outfall Nutrients	2022-10-05	10:40	Water				X	X	X	X	X				
	Elk River @ Outfall Bacteriological	2022-10-05	10:40	Water	X											
	3) Elk River Downstream Routine	2022-10-05	10:50	Water		X	X									
	Elk River Downstream Nutrients	2022-10-05	10:50	Water				X	X	X	X	X				
Elk River Downstream Bacteriological	2022-10-05	10:50	Water	X												
TURN AROUND REQUIRED: <input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)					RELINQUISHED BY: Carter Barrett		DATE: 2022/10/05		RECEIVED BY: <i>[Signature]</i>		DATE: 10/16		TIME: 9:20			
SEND INVOICE TO: <input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)					RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:		TIME:			
INVOICE FORMAT: <input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX																
SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com					FOR LAB USE ONLY											
					Cooler Seal Intact? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Sample Temperature: _____ °C		Cooling Method?							
							Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No		Icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None							

Environmental Division
 Calgary
 Work Order Reference
CG2213834



Telephone: +1 403 407 1800

Environmental Division
 Calgary
 Work Order Reference
CG2213834



CERTIFICATE OF ANALYSIS

<p>Work Order : CG2214582</p> <p>Client : Fernie Alpine Resort Utilities Corporation</p> <p>Contact : Patrick Majer</p> <p>Address : 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2</p> <p>Telephone : 403 254 7669</p> <p>Project : FARUC WWTP OCTOBER MONTHLY EMS</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : CB</p> <p>Site : ----</p> <p>Quote number : CG21-FARU100-0002</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 3</p> <p>Laboratory : Calgary - Environmental</p> <p>Account Manager : Patryk Wojciak</p> <p>Address : 2559 29th Street NE Calgary AB Canada T1Y 7B5</p> <p>Telephone : +1 403 407 1800</p> <p>Date Samples Received : 20-Oct-2022 09:20</p> <p>Date Analysis Commenced : 20-Oct-2022</p> <p>Issue Date : 26-Oct-2022 17:18</p>
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per 100 mL
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

CG2214582-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP INFLUENT

Client sampling date / time: 19-Oct-2022 10:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	7.23	0.10	pH units	E108	24-Oct-2022	24-Oct-2022	711140
solids, total suspended [TSS]	----	187	3.0	mg/L	E160	-	25-Oct-2022	708444
Aggregate Organics								
biochemical oxygen demand [BOD]	----	155	75.0	mg/L	E550	-	21-Oct-2022	708895

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

CG2214582-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP EFFLUENT

Client sampling date / time: 19-Oct-2022 10:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	7.87	0.10	pH units	E108	24-Oct-2022	24-Oct-2022	711140
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	25-Oct-2022	708444
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0152	0.0050	mg/L	E298	20-Oct-2022	20-Oct-2022	706314
nitrate (as N)	14797-55-8	<0.0250 ^{DLDS}	0.0250	mg/L	E235.NO3-L	20-Oct-2022	20-Oct-2022	705961
nitrite (as N)	14797-65-0	31.4	0.0050	mg/L	E235.NO2-L	20-Oct-2022	20-Oct-2022	705962
phosphate, ortho-, dissolved (as P)	14265-44-2	0.248 ^{DLHC}	0.0100	mg/L	E378-U	20-Oct-2022	20-Oct-2022	706170
phosphorus, total	7723-14-0	0.252 ^{DLHC}	0.0200	mg/L	E372-U	25-Oct-2022	26-Oct-2022	714227
nitrate + nitrite (as N)	----	31.4	0.0255	mg/L	EC235.N+N	-	21-Oct-2022	-
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	<1	1	CFU/100mL	E012.FC	-	20-Oct-2022	709249
Aggregate Organics								
biochemical oxygen demand [BOD]	----	<2.0	2.0	mg/L	E550	-	21-Oct-2022	708895

Please refer to the General Comments section for an explanation of any qualifiers detected.



QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : CG2214582</p> <p>Client : Fernie Alpine Resort Utilities Corporation</p> <p>Contact : Patrick Majer</p> <p>Address : 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2</p> <p>Telephone : 403 254 7669</p> <p>Project : FARUC WWTP OCTOBER MONTHLY EMS</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : CB</p> <p>Site : ----</p> <p>Quote number : CG21-FARU100-0002</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 8</p> <p>Laboratory : Calgary - Environmental</p> <p>Account Manager : Patryk Wojciak</p> <p>Address : 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5</p> <p>Telephone : +1 403 407 1800</p> <p>Date Samples Received : 20-Oct-2022 09:20</p> <p>Issue Date : 26-Oct-2022 17:16</p>
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This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- Matrix Spike outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Anions and Nutrients	Anonymous	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	150 %	75.0-125%	Recovery greater than upper data quality objective



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP EFFLUENT	E550	19-Oct-2022	----	----	----		21-Oct-2022	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] WWTP INFLUENT	E550	19-Oct-2022	----	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	19-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE WWTP EFFLUENT	E378-U	19-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE WWTP EFFLUENT	E235.NO3-L	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE WWTP EFFLUENT	E235.NO2-L	19-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	3 days	1 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	19-Oct-2022	----	----	----		20-Oct-2022	30 hrs	26 hrs	✓
Physical Tests : pH by Meter										
HDPE WWTP EFFLUENT	E108	19-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	0.25 hrs	0.27 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE WWTP INFLUENT	E108	19-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	0.25 hrs	0.27 hrs	* EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	706314	1	18	5.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	708895	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	706170	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	705961	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	705962	1	13	7.6	5.0	✓
pH by Meter	E108	711140	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	709249	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714227	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	708444	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	706314	1	18	5.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	708895	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	706170	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	705961	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	705962	1	13	7.6	5.0	✓
pH by Meter	E108	711140	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714227	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	708444	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	706314	1	18	5.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	708895	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	706170	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	705961	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	705962	1	13	7.6	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	709249	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714227	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	708444	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	706314	1	18	5.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	706170	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	705961	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	705962	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714227	1	20	5.0	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
---------------------	--------------	--------	------------------	---------------------



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order	: CG2214582	Page	: 1 of 6
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	:	Telephone	: +1 403 407 1800
Project	: FARUC WWTP OCTOBER MONTHLY EMS	Date Samples Received	: 20-Oct-2022 09:20
PO	: ----	Date Analysis Commenced	: 20-Oct-2022
C-O-C number	: ----	Issue Date	: 26-Oct-2022 17:16
Sampler	: CB 403 254 7669		
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sunil Palak		Calgary Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

Page : 2 of 6
Work Order : CG2214582
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WWTP OCTOBER MONTHLY EMS



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 708444)											
CG2214532-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	20.5	22.1	1.6	Diff <2x LOR	----
Physical Tests (QC Lot: 711140)											
CG2214554-001	Anonymous	pH	----	E108	0.10	pH units	7.94	8.02	1.00%	4%	----
Anions and Nutrients (QC Lot: 705961)											
CG2214579-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	13.4	13.3	0.662%	20%	----
Anions and Nutrients (QC Lot: 705962)											
CG2214579-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0062	<0.0050	0.0012	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 706170)											
CG2214556-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 706314)											
CG2214557-003	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0174	0.0164	0.0010	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714227)											
CG2214551-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	0.842	0.822	2.37%	20%	----
Microbiological Tests (QC Lot: 709249)											
CG2214576-001	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	3	2	1	Diff <2x LOR	----
Aggregate Organics (QC Lot: 708895)											
CG2214580-004	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 708444)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 705961)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 705962)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 706170)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 706314)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 714227)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 709249)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----
Aggregate Organics (QCLot: 708895)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 708444)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	105	85.0	115	----
Physical Tests (QCLot: 711140)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Anions and Nutrients (QCLot: 705961)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 705962)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.5	90.0	110	----
Anions and Nutrients (QCLot: 706170)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	104	80.0	120	----
Anions and Nutrients (QCLot: 706314)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 714227)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	96.2	80.0	120	----
Aggregate Organics (QCLot: 708895)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	98.4	85.0	115	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1x$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 705961)										
CG2214579-003	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	3.76 mg/L	2.5 mg/L	150	75.0	125	----
Anions and Nutrients (QCLot: 705962)										
CG2214579-003	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.492 mg/L	0.5 mg/L	98.4	75.0	125	----
Anions and Nutrients (QCLot: 706170)										
CG2214556-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0512 mg/L	0.05 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 706314)										
CG2214557-004	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 714227)										
CG2214563-001	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----



SEND REPORT TO:

CHAIN OF CUSTODY FORM

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER
 ADDRESS: 1505 - 17TH AVENUE SOUTH WEST
 CITY: CALGARY PROV: ALBERTA POSTAL CODE: T2T 0E2
 TEL: 403 - 256 - 8473 FAX: 403 - 244 - 3774 SAMPLER: Carter Barrett
 PROJECT NAME AND NO.: FARUC WWTP October Monthly EMS QUOTE NO.:
 PO NO.: ALS CONTACT: Patryk Wojciak
 REPORT FORMAT: HARDCOPY EMAIL - ADDRESS: pmajer@skircr.com
 FAX EXCEL PDF OTHER:

ANALYSIS REQUESTED:				Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD
					X	X							
												X	
					X	X							
							X	X	X	X	X		
				X									



Telephone : +1 403 407 1800

NOTES (sample comments, due de

WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX
		YYYY-MM-DD	TIME	
	WWTP Influent Routine	2022-10-19	10:00	Water
	WWTP Influent BOD	2022-10-19	10:00	Water
	WWTP Effluent Routine	2022-10-19	10:00	Water
	WWTP Effluent BOD	2022-10-19	10:00	Water
	WWTP Effluent Nutrients	2022-10-19	10:00	Water
	WWTP Effluent Bacteriological	2022-10-19	10:00	Water

FOR LAB USE ONLY

TURN AROUND REQUIRED: ROUTINE RUSH SPECIFY DATE: _____ (surcharge may apply)
 SEND INVOICE TO: SAME AS REPORT DIFFERENT FROM REPORT (provide details)
 INVOICE FORMAT: HARDCOPY PDF FAX

RELINQUISHED BY: Carter Barrett DATE: 2022-10-19 RECEIVED BY: [Signature] DATE: [Signature]
 TIME: 11:00 TIME: [Signature]
 RELINQUISHED BY: DATE: RECEIVED BY: DATE:
 TIME: TIME:

SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com

FOR LAB USE ONLY
 Cooler Seal Intact? Yes ___ No ___ N/A Sample Temperature: _____ °C Cooling Method? Icepacks ___ Ice ___ None
 Frozen? Yes ___ No ___

Environmental Division
Calgary
Work Order Reference
CG2214582



CERTIFICATE OF ANALYSIS

<p>Work Order : CG2216370</p> <p>Client : Fernie Alpine Resort Utilities Corporation</p> <p>Contact : Patrick Majer</p> <p>Address : 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2</p> <p>Telephone : 403 254 7669</p> <p>Project : FARUC WWTP November Monthly EMS</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : CB</p> <p>Site : ----</p> <p>Quote number : CG21-FARU100-0002</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 3</p> <p>Laboratory : Calgary - Environmental</p> <p>Account Manager : Patryk Wojciak</p> <p>Address : 2559 29th Street NE Calgary AB Canada T1Y 7B5</p> <p>Telephone : +1 403 407 1800</p> <p>Date Samples Received : 24-Nov-2022 09:05</p> <p>Date Analysis : 24-Nov-2022</p> <p>Commenced :</p> <p>Issue Date : 29-Nov-2022 16:26</p>
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Catherine Fong	Lab Analyst	Inorganics, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per hundred millilitres
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

CG2216370-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP Influent -

Client sampling date / time: 23-Nov-2022 10:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	7.93	0.10	pH units	E108	24-Nov-2022	25-Nov-2022	756891
solids, total suspended [TSS]	----	396	3.0	mg/L	E160	-	26-Nov-2022	756691
Aggregate Organics								
biochemical oxygen demand [BOD]	----	345	75.0	mg/L	E550	-	24-Nov-2022	757035

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

CG2216370-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WWTP Effluent

Client sampling date / time: 23-Nov-2022 10:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.15	0.10	pH units	E108	24-Nov-2022	25-Nov-2022	756891
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	26-Nov-2022	756691
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0111	0.0050	mg/L	E298	24-Nov-2022	24-Nov-2022	756103
nitrate (as N)	14797-55-8	3.83	0.0050	mg/L	E235.NO3-L	24-Nov-2022	24-Nov-2022	756209
nitrite (as N)	14797-65-0	0.759	0.0010	mg/L	E235.NO2-L	24-Nov-2022	24-Nov-2022	756210
phosphate, ortho-, dissolved (as P)	14265-44-2	0.128 ^{DLHC}	0.0100	mg/L	E378-U	24-Nov-2022	24-Nov-2022	756381
phosphorus, total	7723-14-0	0.146	0.0020	mg/L	E372-U	24-Nov-2022	25-Nov-2022	756078
nitrate + nitrite (as N)	----	4.59	0.0051	mg/L	EC235.N+N	-	25-Nov-2022	757376
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	<1	1	CFU/100mL	E012.FC	-	24-Nov-2022	758004
Aggregate Organics								
biochemical oxygen demand [BOD]	----	<2.0	2.0	mg/L	E550	-	24-Nov-2022	757035

Please refer to the General Comments section for an explanation of any qualifiers detected.



QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : CG2216370</p> <p>Client : Fernie Alpine Resort Utilities Corporation</p> <p>Contact : Patrick Majer</p> <p>Address : 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2</p> <p>Telephone : 403 254 7669</p> <p>Project : FARUC WWTP November Monthly EMS</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : CB</p> <p>Site : ----</p> <p>Quote number : CG21-FARU100-0002</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 7</p> <p>Laboratory : Calgary - Environmental</p> <p>Account Manager : Patryk Wojciak</p> <p>Address : 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5</p> <p>Telephone : +1 403 407 1800</p> <p>Date Samples Received : 24-Nov-2022 09:05</p> <p>Issue Date : 29-Nov-2022 16:26</p>
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This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-48h] WWTP Effluent	E550	23-Nov-2022	----	----	----		24-Nov-2022	48 hrs	24 hrs	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-48h] WWTP Influent	E550	23-Nov-2022	----	----	----		24-Nov-2022	48 hrs	24 hrs	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WWTP Effluent	E298	23-Nov-2022	24-Nov-2022	----	----		24-Nov-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE WWTP Effluent	E378-U	23-Nov-2022	24-Nov-2022	----	----		24-Nov-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE WWTP Effluent	E235.NO3-L	23-Nov-2022	24-Nov-2022	3 days	1 days	✓	24-Nov-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE WWTP Effluent	E235.NO2-L	23-Nov-2022	24-Nov-2022	----	----		24-Nov-2022	3 days	1 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) WWTP Effluent	E372-U	23-Nov-2022	24-Nov-2022	----	----		25-Nov-2022	28 days	2 days	✓
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) WWTP Effluent	E012.FC	23-Nov-2022	----	----	----		24-Nov-2022	30 hrs	24 hrs	✓
Physical Tests : pH by Meter										
HDPE WWTP Effluent	E108	23-Nov-2022	24-Nov-2022	----	----		25-Nov-2022	0.25 hrs	17.25 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE WWTP Influent	E108	23-Nov-2022	24-Nov-2022	----	----		25-Nov-2022	0.25 hrs	17.25 hrs	* EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE WWTP Effluent	E160	23-Nov-2022	----	----	----		26-Nov-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP Influent	E160	23-Nov-2022	----	----	----		26-Nov-2022	7 days	3 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	756103	1	11	9.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	757035	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	756381	1	19	5.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	756209	1	18	5.5	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	756210	1	18	5.5	5.0	✔
pH by Meter	E108	756891	0	18	0.0	5.0	✖
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	758004	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	756078	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	756691	1	13	7.6	5.0	✔
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	756103	1	11	9.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	757035	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	756381	1	19	5.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	756209	1	18	5.5	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	756210	1	18	5.5	5.0	✔
pH by Meter	E108	756891	1	18	5.5	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	756078	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	756691	1	13	7.6	5.0	✔
Method Blanks (MB)							
Ammonia by Fluorescence	E298	756103	1	11	9.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	757035	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	756381	1	19	5.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	756209	1	18	5.5	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	756210	1	18	5.5	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	758004	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	756078	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	756691	1	13	7.6	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	756103	1	11	9.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	756381	1	19	5.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	756209	1	18	5.5	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	756210	1	18	5.5	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	756078	1	20	5.0	5.0	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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Work Order : CG2216370
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WWTP November Monthly EMS



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

<p>Work Order : CG2216370</p> <p>Client : Fernie Alpine Resort Utilities Corporation</p> <p>Contact : Patrick Majer</p> <p>Address : 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2</p> <p>Telephone :</p> <p>Project : FARUC WWTP November Monthly EMS</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : CB 403 254 7669</p> <p>Site : ----</p> <p>Quote number : CG21-FARU100-0002</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 6</p> <p>Laboratory : Calgary - Environmental</p> <p>Account Manager : Patryk Wojciak</p> <p>Address : 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5</p> <p>Telephone : +1 403 407 1800</p> <p>Date Samples Received : 24-Nov-2022 09:05</p> <p>Date Analysis Commenced : 24-Nov-2022</p> <p>Issue Date : 29-Nov-2022 16:26</p>
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Catherine Fong	Lab Analyst	Calgary Inorganics, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
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Sunil Palak		Calgary Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

Page : 2 of 6
Work Order : CG2216370
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WWTP November Monthly EMS



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 756691)											
CG2216339-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	28.5	27.3	1.2	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 756078)											
CG2216360-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0022	<0.0020	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 756103)											
CG2216369-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.125	mg/L	3.16	3.07	3.04%	20%	----
Anions and Nutrients (QC Lot: 756209)											
CG2216369-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.100	mg/L	61.5	61.6	0.168%	20%	----
Anions and Nutrients (QC Lot: 756210)											
CG2216369-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0200	mg/L	8.51	8.54	0.265%	20%	----
Anions and Nutrients (QC Lot: 756381)											
CG2216362-006	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Microbiological Tests (QC Lot: 758004)											
CG2216370-002	WWTP Effluent	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 757035)											
CG2216316-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 756691)						
solids, total suspended [TSS]	---	E160	3	mg/L	<3.0	---
Anions and Nutrients (QCLot: 756078)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	---
Anions and Nutrients (QCLot: 756103)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 756209)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 756210)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 756381)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
Microbiological Tests (QCLot: 758004)						
coliforms, thermotolerant [fecal]	---	E012.FC	1	CFU/100mL	<1	---
Aggregate Organics (QCLot: 757035)						
biochemical oxygen demand [BOD]	---	E550	2	mg/L	<2.0	---



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 756691)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	98.9	85.0	115	----
Physical Tests (QCLot: 756891)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Anions and Nutrients (QCLot: 756078)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	95.6	80.0	120	----
Anions and Nutrients (QCLot: 756103)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 756209)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 756210)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 756381)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	106	80.0	120	----
Aggregate Organics (QCLot: 757035)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	86.2	85.0	115	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1x$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 756078)										
CG2216361-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0506 mg/L	0.05 mg/L	101	70.0	130	----
Anions and Nutrients (QCLot: 756103)										
CG2216369-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 756209)										
CG2216375-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.41 mg/L	2.5 mg/L	96.2	75.0	125	----
Anions and Nutrients (QCLot: 756210)										
CG2216375-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.490 mg/L	0.5 mg/L	98.0	75.0	125	----
Anions and Nutrients (QCLot: 756381)										
CG2216362-007	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0530 mg/L	0.05 mg/L	106	70.0	130	----



CERTIFICATE OF ANALYSIS

<p>Work Order : CG2217252</p> <p>Client : Fernie Alpine Resort Utilities Corporation</p> <p>Contact : Patrick Majer</p> <p>Address : 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2</p> <p>Telephone : 403 254 7669</p> <p>Project : FARUC WWTP December Monthly EMS</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : CB</p> <p>Site : ----</p> <p>Quote number : CG21-FARU100-0002</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 3</p> <p>Laboratory : Calgary - Environmental</p> <p>Account Manager : Patryk Wojciak</p> <p>Address : 2559 29th Street NE Calgary AB Canada T1Y 7B5</p> <p>Telephone : +1 403 407 1800</p> <p>Date Samples Received : 15-Dec-2022 08:40</p> <p>Date Analysis Commenced : 15-Dec-2022</p> <p>Issue Date : 21-Dec-2022 14:45</p>
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Catherine Fong	Lab Analyst	Inorganics, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Kevin Baxter	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per hundred millilitres
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

Sub-Matrix: Water					Client sample ID	WWTP Influent	WWTP Effluent	----	----	----
(Matrix: Water)					Client sampling date / time	14-Dec-2022 11:00	14-Dec-2022 11:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	CG2217252-001 Result	CG2217252-002 Result	-----	-----	-----	
Physical Tests										
pH	----	E108	0.10	pH units	8.06	8.24	----	----	----	
solids, total suspended [TSS]	----	E160	3.0	mg/L	59.0	<3.0	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0248	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	27.9	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	0.0072	----	----	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	0.559	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.595 ^{DLHC}	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	27.9	----	----	----	
Microbiological Tests										
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	----	152	----	----	----	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	79.4	10.8	----	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.



QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : CG2217252</p> <p>Client : Fernie Alpine Resort Utilities Corporation</p> <p>Contact : Patrick Majer</p> <p>Address : 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2</p> <p>Telephone : 403 254 7669</p> <p>Project : FARUC WWTP December Monthly EMS</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : CB</p> <p>Site : ----</p> <p>Quote number : CG21-FARU100-0002</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 7</p> <p>Laboratory : Calgary - Environmental</p> <p>Account Manager : Patryk Wojciak</p> <p>Address : 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5</p> <p>Telephone : +1 403 407 1800</p> <p>Date Samples Received : 15-Dec-2022 08:40</p> <p>Issue Date : 21-Dec-2022 14:45</p>
---	--

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-48h] WWTP Effluent	E550	14-Dec-2022	----	----	----		16-Dec-2022	48 hrs	46 hrs	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-48h] WWTP Influent	E550	14-Dec-2022	----	----	----		16-Dec-2022	48 hrs	46 hrs	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WWTP Effluent	E298	14-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE WWTP Effluent	E378-U	14-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE WWTP Effluent	E235.NO3-L	14-Dec-2022	15-Dec-2022	3 days	1 days	✓	15-Dec-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE WWTP Effluent	E235.NO2-L	14-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	3 days	1 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) WWTP Effluent	E372-U	14-Dec-2022	16-Dec-2022	----	----		20-Dec-2022	28 days	6 days	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) WWTP Effluent	E012.FC	14-Dec-2022	----	----	----		15-Dec-2022	30 hrs	23 hrs	✓	
Physical Tests : pH by Meter											
HDPE WWTP Effluent	E108	14-Dec-2022	16-Dec-2022	----	----		16-Dec-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE WWTP Influent	E108	14-Dec-2022	16-Dec-2022	----	----		16-Dec-2022	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE WWTP Effluent	E160	14-Dec-2022	----	----	----		20-Dec-2022	7 days	6 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE WWTP Influent	E160	14-Dec-2022	----	----	----		20-Dec-2022	7 days	6 days	✓	

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	779687	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	781895	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	779742	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	779947	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	779948	1	20	5.0	5.0	✔
pH by Meter	E108	781497	1	20	5.0	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	781554	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	781644	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	783514	1	20	5.0	5.0	✔
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	779687	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	781895	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	779742	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	779947	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	779948	1	20	5.0	5.0	✔
pH by Meter	E108	781497	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	781644	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	783514	1	20	5.0	5.0	✔
Method Blanks (MB)							
Ammonia by Fluorescence	E298	779687	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	781895	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	779742	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	779947	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	779948	1	20	5.0	5.0	✔
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	781554	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	781644	1	20	5.0	5.0	✔
TSS by Gravimetry	E160	783514	1	20	5.0	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	779687	1	20	5.0	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	779742	1	20	5.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	779947	1	20	5.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	779948	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	781644	1	20	5.0	5.0	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
---------------------	--------------	--------	------------------	---------------------

Page : 7 of 7
Work Order : CG2217252
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WWTP December Monthly EMS



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order : **CG2217252**
Client : Fernie Alpine Resort Utilities Corporation
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
 Calgary AB Canada T2T 0E2
Telephone :
Project : FARUC WWTP December Monthly EMS
PO : ----
C-O-C number : ----
Sampler : CB 403 254 7669
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 6
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
 Calgary, Alberta Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 15-Dec-2022 08:40
Date Analysis Commenced : 15-Dec-2022
Issue Date : 21-Dec-2022 14:45

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Catherine Fong	Lab Analyst	Calgary Inorganics, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Kevin Baxter	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Sunil Palak		Calgary Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

Page : 2 of 6
Work Order : CG2217252
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC WWTP December Monthly EMS



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 781497)											
CG2217249-001	Anonymous	pH	----	E108	0.10	pH units	8.47	8.49	0.236%	4%	----
Physical Tests (QC Lot: 783514)											
CG2217252-001	WWTP Influent	solids, total suspended [TSS]	----	E160	3.0	mg/L	59.0	55.2	6.65%	20%	----
Anions and Nutrients (QC Lot: 779687)											
CG2217230-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	0.0066	0.0016	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 779742)											
CG2217226-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 779947)											
CG2217242-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0081	0.0080	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 779948)											
CG2217242-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0012	0.0012	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 781644)											
CG2217252-002	WWTP Effluent	phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	0.595	0.595	0.0495%	20%	----
Microbiological Tests (QC Lot: 781554)											
CG2217252-002	WWTP Effluent	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	152	144	5.40%	65%	----
Aggregate Organics (QC Lot: 781895)											
CG2217259-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	2.0	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 783514)						
solids, total suspended [TSS]	---	E160	3	mg/L	<3.0	---
Anions and Nutrients (QCLot: 779687)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 779742)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 779947)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 779948)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 781644)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	---
Microbiological Tests (QCLot: 781554)						
coliforms, thermotolerant [fecal]	---	E012.FC	1	CFU/100mL	<1	---
Aggregate Organics (QCLot: 781895)						
biochemical oxygen demand [BOD]	---	E550	2	mg/L	<2.0	---



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 781497)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 783514)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	91.3	85.0	115	----
Anions and Nutrients (QCLot: 779687)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 779742)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	105	80.0	120	----
Anions and Nutrients (QCLot: 779947)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 779948)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 781644)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	102	80.0	120	----
Aggregate Organics (QCLot: 781895)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	91.1	85.0	115	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1 \times$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 779687)										
CG2217230-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.108 mg/L	0.1 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 779742)										
CG2217226-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0546 mg/L	0.05 mg/L	109	70.0	130	----
Anions and Nutrients (QCLot: 779947)										
CG2217242-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.57 mg/L	2.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 779948)										
CG2217242-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.521 mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 781644)										
CG2217289-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0448 mg/L	0.05 mg/L	89.5	70.0	130	----



COLIFORM SAMPLE DECLARATION FORM (Page 2 of 2)

C Please complete this section ONLY if samples are Drinking Water Sample(s).

Company, Water System Name or Name of Home Owner:

FERNIE ALPINE RESORT UTILITIES CORP.

Address: 505-17th AVE SW CALGARY	Phone No: (403) 256 8473	Fax No: (403) 244 3774	After Hours/Emergency No: (403) 861 8730
Water Supplier: PATRICK MAJER	Phone No: (403) 256 8473	Fax No: (403) 244 3774	After Hours/Emergency No: (403) 861 8730
Sampler/Submitter: Cater Barrett / Claudia Heinrich	Phone No: (306) 861 7001	Fax No: ()	

Person to whom results should be sent.
Sampler or submitter of samples if different than Water Supplier.

D. Please complete this section ONLY if samples are subject to regulation under the Drinking Water Protection Act.

Health Authority Region and/or Service Area:

INTERIOR HEALTH

Drinking Water Officer Name: DAN BYRON	Phone No: (250) 420 2240	Fax No: ()	After Hours/Emergency No: (250) 421 3471
Medical Health Officer Name:	Phone No: ()	Fax No: ()	After Hours/Emergency No: (1866) 457 5648

There are five B.C. Health Authority Regions and 16 associated Health Service Delivery Areas:

- Northern:** Northwest, Northeast and Northern Interior
- Interior:** East Kootenay, Kootenay/Boundary, Okanagan and Thompson/Cariboo
- Vancouver Island:** North Vancouver Island, Central Vancouver Island and South Vancouver Island
- Vancouver Coastal:** North Shore / Coast Garibaldi, Vancouver and Richmond
- Fraser:** Fraser North, Fraser South and Fraser East

E. This section for lab use only.

Received By:	Date:	Time: AM PM
Sample Temperature Upon Receipt:	COOLING METHOD: ICEPACKS <input type="checkbox"/> ICE <input type="checkbox"/> NONE <input type="checkbox"/>	



CERTIFICATE OF ANALYSIS

Work Order	: CG2217715	Page	: 1 of 4
Client	: Fernie Alpine Resort Utilities Corporation	Laboratory	: Calgary - Environmental
Contact	: Patrick Majer	Account Manager	: Patryk Wojciak
Address	: 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 254 7669	Telephone	: +1 403 407 1800
Project	: FARUC - WINTER EMS WEEK 1	Date Samples Received	: 29-Dec-2022 08:55
PO	: ----	Date Analysis	: 29-Dec-2022
C-O-C number	: ----	Commenced	
Sampler	: Carter Barrett	Issue Date	: 06-Jan-2023 11:08
Site	: ----		
Quote number	: CG21-FARU100-0002		
No. of samples received	: 3		
No. of samples analysed	: 3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Harpreet Chawla	Team Leader - Inorganics	Microbiology, Calgary, Alberta
Kevin Baxter	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per hundred millilitres
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.



Analytical Results

CG2217715-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Elk River Upstream Routine

Client sampling date / time: 28-Dec-2022 11:30

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	7.97	0.10	pH units	E108	04-Jan-2023	04-Jan-2023	793654
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	04-Jan-2023	792697
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	<0.0050	0.0050	mg/L	E298	29-Dec-2022	29-Dec-2022	791074
nitrate (as N)	14797-55-8	0.545	0.0050	mg/L	E235.NO3-L	29-Dec-2022	29-Dec-2022	790647
nitrite (as N)	14797-65-0	0.0013	0.0010	mg/L	E235.NO2-L	29-Dec-2022	29-Dec-2022	790648
phosphate, ortho-, dissolved (as P)	14265-44-2	0.0044	0.0010	mg/L	E378-U	29-Dec-2022	29-Dec-2022	790777
phosphorus, total	7723-14-0	0.0146	0.0020	mg/L	E372-U	04-Jan-2023	04-Jan-2023	792389
nitrate + nitrite (as N)	----	0.546	0.0051	mg/L	EC235.N+N	-	30-Dec-2022	791517
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	57	1	CFU/100mL	E012.FC	-	29-Dec-2022	791993

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

CG2217715-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Elk River @ Outfall

Client sampling date / time: 28-Dec-2022 11:45

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.03	0.10	pH units	E108	04-Jan-2023	04-Jan-2023	793654
solids, total suspended [TSS]	----	8.3	3.0	mg/L	E160	-	04-Jan-2023	792697
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	<0.0050	0.0050	mg/L	E298	29-Dec-2022	29-Dec-2022	791074
nitrate (as N)	14797-55-8	0.0996	0.0050	mg/L	E235.NO3-L	29-Dec-2022	29-Dec-2022	790647
nitrite (as N)	14797-65-0	0.0014	0.0010	mg/L	E235.NO2-L	29-Dec-2022	29-Dec-2022	790648
phosphate, ortho-, dissolved (as P)	14265-44-2	0.0112	0.0010	mg/L	E378-U	29-Dec-2022	29-Dec-2022	790777
phosphorus, total	7723-14-0	0.0358	0.0020	mg/L	E372-U	04-Jan-2023	04-Jan-2023	792389
nitrate + nitrite (as N)	----	0.101	0.0051	mg/L	EC235.N+N	-	30-Dec-2022	791517
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	78	1	CFU/100mL	E012.FC	-	29-Dec-2022	791993

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

CG2217715-003

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Elk River Downstream

Client sampling date / time: 28-Dec-2022 12:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.18	0.10	pH units	E108	04-Jan-2023	04-Jan-2023	793654
solids, total suspended [TSS]	----	3.9	3.0	mg/L	E160	-	04-Jan-2023	792697



Analytical Results

CG2217715-003

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Elk River Downstream

Client sampling date / time: 28-Dec-2022 12:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0170	0.0050	mg/L	E298	29-Dec-2022	29-Dec-2022	791074
nitrate (as N)	14797-55-8	1.69	0.0050	mg/L	E235.NO3-L	29-Dec-2022	29-Dec-2022	790647
nitrite (as N)	14797-65-0	0.0025	0.0010	mg/L	E235.NO2-L	29-Dec-2022	29-Dec-2022	790648
phosphate, ortho-, dissolved (as P)	14265-44-2	<0.0010	0.0010	mg/L	E378-U	29-Dec-2022	29-Dec-2022	790777
phosphorus, total	7723-14-0	0.0120	0.0020	mg/L	E372-U	04-Jan-2023	04-Jan-2023	792389
nitrate + nitrite (as N)	----	1.69	0.0051	mg/L	EC235.N+N	-	30-Dec-2022	791517
Microbiological Tests								
coliforms, thermotolerant [fecal]	----	18	1	CFU/100mL	E012.FC	-	29-Dec-2022	791993

Please refer to the General Comments section for an explanation of any qualifiers detected.



QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : CG2217715</p> <p>Client : Fernie Alpine Resort Utilities Corporation</p> <p>Contact : Patrick Majer</p> <p>Address : 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2</p> <p>Telephone : 403 254 7669</p> <p>Project : FARUC - WINTER EMS WEEK 1</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : Carter Barrett</p> <p>Site : ----</p> <p>Quote number : CG21-FARU100-0002</p> <p>No. of samples received : 3</p> <p>No. of samples analysed : 3</p>	<p>Page : 1 of 8</p> <p>Laboratory : Calgary - Environmental</p> <p>Account Manager : Patryk Wojciak</p> <p>Address : 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5</p> <p>Telephone : +1 403 407 1800</p> <p>Date Samples Received : 29-Dec-2022 08:55</p> <p>Issue Date : 06-Jan-2023 11:08</p>
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This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River @ Outfall	E298	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River Downstream	E298	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Elk River Upstream Routine	E298	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Elk River @ Outfall	E378-U	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Elk River Downstream	E378-U	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Elk River Upstream Routine	E378-U	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	3 days	1 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Elk River @ Outfall	E235.NO3-L	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Elk River Downstream	E235.NO3-L	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Elk River Upstream Routine	E235.NO3-L	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Elk River @ Outfall	E235.NO2-L	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Elk River Downstream	E235.NO2-L	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Elk River Upstream Routine	E235.NO2-L	28-Dec-2022	29-Dec-2022	----	----		29-Dec-2022	3 days	1 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) Elk River @ Outfall	E372-U	28-Dec-2022	04-Jan-2023	----	----		04-Jan-2023	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) Elk River Downstream	E372-U	28-Dec-2022	04-Jan-2023	----	----		04-Jan-2023	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)											
Amber glass total (sulfuric acid) Elk River Upstream Routine	E372-U	28-Dec-2022	04-Jan-2023	----	----		04-Jan-2023	28 days	7 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River @ Outfall	E012.FC	28-Dec-2022	----	----	----		29-Dec-2022	30 hrs	24 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River Downstream	E012.FC	28-Dec-2022	----	----	----		29-Dec-2022	30 hrs	24 hrs	✓	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)											
Sterile HDPE (Sodium thiosulphate) Elk River Upstream Routine	E012.FC	28-Dec-2022	----	----	----		29-Dec-2022	30 hrs	25 hrs	✓	
Physical Tests : pH by Meter											
HDPE Elk River @ Outfall	E108	28-Dec-2022	04-Jan-2023	----	----		04-Jan-2023	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Elk River Downstream	E108	28-Dec-2022	04-Jan-2023	----	----		04-Jan-2023	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Elk River Upstream Routine	E108	28-Dec-2022	04-Jan-2023	----	----		04-Jan-2023	0.25 hrs	0.26 hrs	* EHTR-FM	
Physical Tests : TSS by Gravimetry											
HDPE Elk River @ Outfall	E160	28-Dec-2022	----	----	----		04-Jan-2023	7 days	7 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE Elk River Downstream	E160	28-Dec-2022	----	----	----		04-Jan-2023	7 days	7 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE Elk River Upstream Routine	E160	28-Dec-2022	----	----	----		04-Jan-2023	7 days	7 days	✓	

[Legend & Qualifier Definitions](#)

Page : 6 of 8
Work Order : CG2217715
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - WINTER EMS WEEK 1



EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	791074	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	790777	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	790647	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	790648	1	19	5.2	5.0	✓
pH by Meter	E108	793654	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	791993	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	792389	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	792697	1	14	7.1	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	791074	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	790777	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	790647	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	790648	1	19	5.2	5.0	✓
pH by Meter	E108	793654	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	792389	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	792697	1	14	7.1	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	791074	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	790777	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	790647	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	790648	1	19	5.2	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	791993	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	792389	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	792697	1	14	7.1	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	791074	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	790777	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	790647	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	790648	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	792389	1	20	5.0	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

<p>Work Order : CG2217715</p> <p>Client : Fernie Alpine Resort Utilities Corporation</p> <p>Contact : Patrick Majer</p> <p>Address : 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2</p> <p>Telephone :</p> <p>Project : FARUC - WINTER EMS WEEK 1</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : Carter Barrett, 403 254 7669</p> <p>Site : ----</p> <p>Quote number : CG21-FARU100-0002</p> <p>No. of samples received : 3</p> <p>No. of samples analysed : 3</p>	<p>Page : 1 of 6</p> <p>Laboratory : Calgary - Environmental</p> <p>Account Manager : Patryk Wojciak</p> <p>Address : 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5</p> <p>Telephone : +1 403 407 1800</p> <p>Date Samples Received : 29-Dec-2022 08:55</p> <p>Date Analysis Commenced : 29-Dec-2022</p> <p>Issue Date : 06-Jan-2023 11:08</p>
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Harpreet Chawla	Team Leader - Inorganics	Calgary Microbiology, Calgary, Alberta
Kevin Baxter	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

Page : 2 of 6
Work Order : CG2217715
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - WINTER EMS WEEK 1



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 792697)											
CG2217715-001	Elk River Upstream Routine	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 793654)											
CG2217691-012	Anonymous	pH	----	E108	0.10	pH units	5.45	5.39	1.11%	4%	----
Anions and Nutrients (QC Lot: 790647)											
CG2217659-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	7.99	8.00	0.198%	20%	----
Anions and Nutrients (QC Lot: 790648)											
CG2217659-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 790777)											
CG2217678-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 791074)											
CG2217704-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	1.25	mg/L	57.8	61.1	5.43%	20%	----
Anions and Nutrients (QC Lot: 792389)											
CG2217715-001	Elk River Upstream Routine	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0146	0.0147	0.0001	Diff <2x LOR	----
Microbiological Tests (QC Lot: 791993)											
FJ2203534-002	Anonymous	coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	14	12	15.4%	65%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 792697)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 790647)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 790648)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 790777)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 791074)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 792389)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 791993)						
coliforms, thermotolerant [fecal]	----	E012.FC	1	CFU/100mL	<1	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 792697)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	94.9	85.0	115	----
Physical Tests (QCLot: 793654)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Anions and Nutrients (QCLot: 790647)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 790648)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 790777)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	101	80.0	120	----
Anions and Nutrients (QCLot: 791074)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.9	85.0	115	----
Anions and Nutrients (QCLot: 792389)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	95.7	80.0	120	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1x$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 790647)										
CG2217659-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	ND mg/L	2.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 790648)										
CG2217659-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.497 mg/L	0.5 mg/L	99.4	75.0	125	----
Anions and Nutrients (QCLot: 790777)										
CG2217678-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0494 mg/L	0.05 mg/L	98.8	70.0	130	----
Anions and Nutrients (QCLot: 791074)										
CG2217704-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0991 mg/L	0.1 mg/L	99.1	75.0	125	----
Anions and Nutrients (QCLot: 792389)										
CG2217715-002	Elk River @ Outfall	phosphorus, total	7723-14-0	E372-U	0.0414 mg/L	0.05 mg/L	82.8	70.0	130	----



Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 Fax: 780-513-2181
 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 Saskatoon SK, 818 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

CHAIN OF CUSTODY FORM

PAGE OF

SEND REPORT TO:

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:													
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST																	
CITY: CALGARY		PROV: ALBERTA		POSTAL CODE: T2T 0E2													
TEL: 403 - 256 - 8473		FAX: 403 - 244 - 3774		SAMPLER: Carter Barrett													
PROJECT NAME AND NO.: FARUC - Winter EMS Week 1				QUOTE NO.:													
PO NO.:		ALS CONTACT: Patryk Woyciak															
REPORT FORMAT:		<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com															
		<input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:															
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)		
		YYYY-MM-DD	TIME														
FOR LAB USE ONLY	1	Elk River Upstream Routine	2022-12-28	11:30	Water		X	X									
		Elk River Upstream Nutrients	2022-12-28	11:30	Water				X	X	X	X	X				
		Elk River Upstream Bacteriological	2022-12-28	11:30	Water	X											
	2	Elk River @ Outfall Routine	2022-12-28	11:45	Water		X	X									
		Elk River @ Outfall Nutrients	2022-12-28	11:45	Water				X	X	X	X	X				
		Elk River @ Outfall Bacteriological	2022-12-28	11:45	Water	X											
	3	Elk River Downstream Routine	2022-12-28	12:00	Water		X	X									
		Elk River Downstream Nutrients	2022-12-28	12:00	Water				X	X	X	X	X				
		Elk River Downstream Bacteriological	2022-12-28	12:00	Water	X											

Environmental Division
 Calgary
 Work Order Reference
CG2217715



Telephone : +1 403 407 1600

TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)		RELINQUISHED BY:	DATE:	2022/12/28	RECEIVED BY:	DATE:	29/12/22
				Carter Barrett	TIME:	13:30	NC	TIME:	0855
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details)		RELINQUISHED BY:	DATE:		RECEIVED BY:	DATE:	
INVOICE FORMAT:		<input checked="" type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX			TIME:			TIME:	
SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com				FOR LAB USE ONLY					
				Cooler Seal Intact?	Sample Temperature: \neq °C	Cooling Method?			
				Yes ___ No ___ N/A	Frozen? Yes <input checked="" type="checkbox"/> No	X Icepacks ___ Ice ___ None			



CERTIFICATE OF ANALYSIS

Work Order : **CG2301033**
Client : **Fernie Alpine Resort Utilities Corporation**
Contact : Patrick Majer
Address : 1505 - 17TH AVENUE SW
 Calgary AB Canada T2T 0E2
Telephone : 403 254 7669
Project : FARUC - WINTER EMS WEEK 5
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : CG21-FARU100-0002
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 3
Laboratory : Calgary - Environmental
Account Manager : Patryk Wojciak
Address : 2559 29th Street NE
 Calgary AB Canada T1Y 7B5
Telephone : +1 403 407 1800
Date Samples Received : 26-Jan-2023 09:00
Date Analysis Commenced : 26-Jan-2023
Issue Date : 31-Jan-2023 12:50

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Catherine Fong	Lab Analyst	Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Kevin Baxter	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Sunil Palak		Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
CFU/100mL	colony forming units per hundred millilitres
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	WWTP INFLUENT	WWTP EFFLUENT	ELK RIVER UPSTREAM	ELK RIVER @ OUTFALL	ELK RIVER DOWNSTREAM
Client sampling date / time					25-Jan-2023 10:00	25-Jan-2023 10:00	25-Jan-2023 10:15	25-Jan-2023 10:25	25-Jan-2023 10:45	
Analyte	CAS Number	Method	LOR	Unit	CG2301033-001 Result	CG2301033-002 Result	CG2301033-003 Result	CG2301033-004 Result	CG2301033-005 Result	
Physical Tests										
pH	----	E108	0.10	pH units	8.39	7.57	8.30	8.09	8.29	
Solids, total suspended [TSS]	----	E160	3.0	mg/L	234	3.4	<3.0	<3.0	<3.0	
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	---	0.0113	0.0053	0.0054	<0.0050	
Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	---	31.8	2.02	0.509	2.02	
Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	---	0.0074	0.0031	<0.0010	0.0032	
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	---	0.175	<0.0010	0.0057	<0.0010	
Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	---	0.259 ^{DLHC}	0.0070	0.0133	0.0042	
Nitrate + Nitrite (as N)	---	EC235.N+N	0.0050	mg/L	---	31.8	2.02	0.509	2.02	
Microbiological Tests										
Coliforms, thermotolerant [fecal]	---	E012.FC	1	CFU/100mL	---	<1	4	<1	<1	
Aggregate Organics										
Biochemical oxygen demand [BOD]	---	E550	2.0	mg/L	161	<2.0	---	---	---	
Chemical oxygen demand [COD]	---	E559-L	10	mg/L	---	14	---	---	---	

Please refer to the General Comments section for an explanation of any qualifiers detected.



QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : CG2301033</p> <p>Client : Fernie Alpine Resort Utilities Corporation</p> <p>Contact : Patrick Majer</p> <p>Address : 1505 - 17TH AVENUE SW Calgary AB Canada T2T 0E2</p> <p>Telephone : 403 254 7669</p> <p>Project : FARUC - WINTER EMS WEEK 5</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : ----</p> <p>Site : ----</p> <p>Quote number : CG21-FARU100-0002</p> <p>No. of samples received : 5</p> <p>No. of samples analysed : 5</p>	<p>Page : 1 of 11</p> <p>Laboratory : Calgary - Environmental</p> <p>Account Manager : Patryk Wojciak</p> <p>Address : 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5</p> <p>Telephone : +1 403 407 1800</p> <p>Date Samples Received : 26-Jan-2023 09:00</p> <p>Issue Date : 31-Jan-2023 12:50</p>
---	---

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-48h] WWTP EFFLUENT	E550	25-Jan-2023	---	---	---		26-Jan-2023	48 hrs	23 hrs	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-48h] WWTP INFLUENT	E550	25-Jan-2023	---	---	---		26-Jan-2023	48 hrs	23 hrs	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E559-L	25-Jan-2023	---	---	---		30-Jan-2023	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E298	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E298	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E298	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E298	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	28 days	1 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE ELK RIVER @ OUTFALL	E378-U	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE ELK RIVER DOWNSTREAM	E378-U	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE ELK RIVER UPSTREAM	E378-U	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE WWTP EFFLUENT	E378-U	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE ELK RIVER @ OUTFALL	E235.NO3-L	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE ELK RIVER DOWNSTREAM	E235.NO3-L	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE ELK RIVER UPSTREAM	E235.NO3-L	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE WWTP EFFLUENT	E235.NO3-L	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE ELK RIVER @ OUTFALL	E235.NO2-L	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE ELK RIVER DOWNSTREAM	E235.NO2-L	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE ELK RIVER UPSTREAM	E235.NO2-L	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE WWTP EFFLUENT	E235.NO2-L	25-Jan-2023	26-Jan-2023	---	---		26-Jan-2023	3 days	1 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) ELK RIVER @ OUTFALL	E372-U	25-Jan-2023	26-Jan-2023	---	---		27-Jan-2023	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) ELK RIVER DOWNSTREAM	E372-U	25-Jan-2023	26-Jan-2023	---	---		27-Jan-2023	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) ELK RIVER UPSTREAM	E372-U	25-Jan-2023	26-Jan-2023	---	---		27-Jan-2023	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) WWTP EFFLUENT	E372-U	25-Jan-2023	26-Jan-2023	---	---		27-Jan-2023	28 days	2 days	✓
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) ELK RIVER DOWNSTREAM	E012.FC	25-Jan-2023	---	---	---		26-Jan-2023	30 hrs	22 hrs	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) ELK RIVER @ OUTFALL	E012.FC	25-Jan-2023	----	----	----		26-Jan-2023	30 hrs	23 hrs	✓
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) ELK RIVER UPSTREAM	E012.FC	25-Jan-2023	----	----	----		26-Jan-2023	30 hrs	23 hrs	✓
Microbiological Tests : Thermotolerant (Fecal) Coliform (MF-mFC)										
Sterile HDPE (Sodium thiosulphate) WWTP EFFLUENT	E012.FC	25-Jan-2023	----	----	----		26-Jan-2023	30 hrs	23 hrs	✓
Physical Tests : pH by Meter										
HDPE ELK RIVER @ OUTFALL	E108	25-Jan-2023	27-Jan-2023	----	----		27-Jan-2023	0.25 hrs	0.26 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE ELK RIVER DOWNSTREAM	E108	25-Jan-2023	27-Jan-2023	----	----		27-Jan-2023	0.25 hrs	0.26 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE ELK RIVER UPSTREAM	E108	25-Jan-2023	27-Jan-2023	----	----		27-Jan-2023	0.25 hrs	0.26 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE WWTP EFFLUENT	E108	25-Jan-2023	27-Jan-2023	----	----		27-Jan-2023	0.25 hrs	0.26 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE WWTP INFLUENT	E108	25-Jan-2023	27-Jan-2023	----	----		27-Jan-2023	0.25 hrs	0.26 hrs	* EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER @ OUTFALL	E160	25-Jan-2023	----	----	----		30-Jan-2023	7 days	5 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER DOWNSTREAM	E160	25-Jan-2023	----	----	----		30-Jan-2023	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE ELK RIVER UPSTREAM	E160	25-Jan-2023	----	----	----		30-Jan-2023	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP EFFLUENT	E160	25-Jan-2023	----	----	----		30-Jan-2023	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE WWTP INFLUENT	E160	25-Jan-2023	----	----	----		30-Jan-2023	7 days	5 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	815079	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	815553	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	817854	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	814864	1	17	5.8	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	815065	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	815064	1	19	5.2	5.0	✓
pH by Meter	E108	816161	1	20	5.0	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	817955	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	814755	1	14	7.1	5.0	✓
TSS by Gravimetry	E160	817635	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	815079	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	815553	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	817854	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	814864	1	17	5.8	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	815065	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	815064	1	19	5.2	5.0	✓
pH by Meter	E108	816161	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	814755	1	14	7.1	5.0	✓
TSS by Gravimetry	E160	817635	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	815079	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	815553	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	817854	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	814864	1	17	5.8	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	815065	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	815064	1	19	5.2	5.0	✓
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC	817955	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	814755	1	14	7.1	5.0	✓
TSS by Gravimetry	E160	817635	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	815079	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	817854	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	814864	1	17	5.8	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	815065	1	19	5.2	5.0	✓



Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS) - Continued							
Nitrite in Water by IC (Low Level)	E235.NO2-L	815064	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	814755	1	14	7.1	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Thermotolerant (Fecal) Coliform (MF-mFC)	E012.FC Calgary - Environmental	Water	APHA 9222 D (mod)	Following filtration (0.45 µm), and incubation at 44.5 ± 0.2°C for 22-26 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
pH by Meter	E108 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Biochemical Oxygen Demand - 5 day	E550 Calgary - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Calgary - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Description</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order : **CG2301033**

Client : Fernie Alpine Resort Utilities Corporation

Contact : Patrick Majer

Address : 1505 - 17TH AVENUE SW
Calgary AB Canada T2T 0E2

Telephone :

Project : FARUC - WINTER EMS WEEK 5

PO : ---

C-O-C number : ---

Sampler : --- 403 254 7669

Site : ---

Quote number : CG21-FARU100-0002

No. of samples received : 5

No. of samples analysed : 5

Page : 1 of 6

Laboratory : Calgary - Environmental

Account Manager : Patryk Wojciak

Address : 2559 29th Street NE
Calgary, Alberta Canada T1Y 7B5

Telephone : +1 403 407 1800

Date Samples Received : 26-Jan-2023 09:00

Date Analysis Commenced : 26-Jan-2023

Issue Date : 31-Jan-2023 12:50

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Catherine Fong	Lab Analyst	Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Kevin Baxter	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Sunil Palak		Calgary Microbiology, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO = Data Quality Objective.
- LOR = Limit of Reporting (detection limit).
- RPD = Relative Percent Difference
- # = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 816161)											
CG2301033-001	WWTP INFLUENT	pH	---	E108	0.10	pH units	8.39	8.40	0.119%	4%	---
Physical Tests (QC Lot: 817635)											
CG2301002-001	Anonymous	Solids, total suspended [TSS]	---	E160	3.0	mg/L	195	195	0.102%	20%	---
Anions and Nutrients (QC Lot: 814755)											
CG2301021-003	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	---
Anions and Nutrients (QC Lot: 814864)											
CG2301021-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	---
Anions and Nutrients (QC Lot: 815064)											
CG2301051-014	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0745	0.0722	3.14%	20%	---
Anions and Nutrients (QC Lot: 815065)											
CG2301051-014	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	27.9	27.7	0.464%	20%	---
Anions and Nutrients (QC Lot: 815079)											
CG2301016-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	1.25	mg/L	50.2	48.8	2.68%	20%	---
Microbiological Tests (QC Lot: 817955)											
CG2301033-002	WWTP EFFLUENT	Coliforms, thermotolerant [fecal]	---	E012.FC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	---
Aggregate Organics (QC Lot: 815553)											
CG2301021-004	Anonymous	Biochemical oxygen demand [BOD]	---	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	---
Aggregate Organics (QC Lot: 817854)											
CG2301021-001	Anonymous	Chemical oxygen demand [COD]	---	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	---



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Work Order : CG2301033
Client : Fernie Alpine Resort Utilities Corporation
Project : FARUC - WINTER EMS WEEK 5

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 817635)						
Solids, total suspended [TSS]	---	E160	3	mg/L	<3.0	---
Anions and Nutrients (QCLot: 814755)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	---
Anions and Nutrients (QCLot: 814864)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 815064)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 815065)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 815079)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Microbiological Tests (QCLot: 817955)						
Coliforms, thermotolerant [fecal]	---	E012.FC	1	CFU/100mL	<1	---
Aggregate Organics (QCLot: 815553)						
Biochemical oxygen demand [BOD]	---	E550	2	mg/L	<2.0	---
Aggregate Organics (QCLot: 817854)						
Chemical oxygen demand [COD]	---	E559-L	10	mg/L	<10	---



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 816161)									
pH	---	E108	---	pH units	7 pH units	100	98.0	102	---
Physical Tests (QCLot: 817635)									
Solids, total suspended [TSS]	---	E160	3	mg/L	150 mg/L	91.6	85.0	115	---
Anions and Nutrients (QCLot: 814755)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	100	80.0	120	---
Anions and Nutrients (QCLot: 814864)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	101	80.0	120	---
Anions and Nutrients (QCLot: 815064)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	102	90.0	110	---
Anions and Nutrients (QCLot: 815065)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	---
Anions and Nutrients (QCLot: 815079)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	107	85.0	115	---
Aggregate Organics (QCLot: 815553)									
Biochemical oxygen demand [BOD]	---	E550	2	mg/L	198 mg/L	106	85.0	115	---
Aggregate Organics (QCLot: 817854)									
Chemical oxygen demand [COD]	---	E559-L	10	mg/L	100 mg/L	103	85.0	115	---



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1 \times$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 814755)										
CG2301021-004	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0411 mg/L	0.05 mg/L	82.3	70.0	130	---
Anions and Nutrients (QCLot: 814864)										
CG2301021-002	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0527 mg/L	0.05 mg/L	105	70.0	130	---
Anions and Nutrients (QCLot: 815064)										
CG2301051-015	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.476 mg/L	0.5 mg/L	95.2	75.0	125	---
Anions and Nutrients (QCLot: 815065)										
CG2301051-015	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.37 mg/L	2.5 mg/L	94.8	75.0	125	---
Anions and Nutrients (QCLot: 815079)										
CG2301016-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	---
Aggregate Organics (QCLot: 817854)										
CG2301021-002	Anonymous	Chemical oxygen demand [COD]	---	E559-L	102 mg/L	100 mg/L	102	75.0	125	---



Acute Toxicity Test Results

Sample collected January 12, 2022

Final Report

February 1, 2022

Submitted to: **Fernie Alpine Resort**
Fernie, BC

SAMPLE INFORMATION

Sample ID/ Internal ID	Dates			Receipt temperature
	Collected	Received	Rainbow trout test initiation	
WASTEWATER / 2122-1096	12-Jan-22 at 1000h	13-Jan-22 at 0930h	14-Jan-22 at 1415h	11.7°C

TEST TYPES

- Rainbow trout 96-h LC50 test

RESULTS

Toxicity test results

Sample ID	Rainbow trout LC50 (% v/v)
WASTEWATER	> 100

LC = Lethal Concentration

QA/QC

QA/QC summary	Rainbow trout
Reference toxicant LC50 (95% CL)	3.3 (2.8-3.9) g/L KCl ¹
Reference toxicant historical mean (2 SD Range)	3.4 (2.6-4.5) g/L KCl
Reference toxicant CV	9.1%
Organism health history	Acceptable
Protocol deviations	See Below
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

¹ Test date, December 30, 2021

LC = Lethal Concentration; CL = Confidence Limit, SD = Standard Deviation; CV = Coefficient of Variation

The 100% test vessel leaked between day 1 and day 2 of testing and the volume in the test vessel was reduced to 13L, consequently the control test vessel and 100% test sample volumes were not consistent on day 2 resulting in a protocol deviation. The control volume was subsequently adjusted to match the test volume.



Report By:
Shae Cole, BSc
Biologist



Reviewed By:
Kayla Knol, P. Biol.
Senior Biologist

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APPENDIX A – Summary of test conditions

Table 1. Summary of test conditions: 96-h rainbow trout (*Oncorhynchus mykiss*) survival test.

Test species	<i>Oncorhynchus mykiss</i>
Organism source	Fish hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 - 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
Test solution renewal	None
Test temperature	15 ± 1°C
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light/8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test Measurements	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	96-hour LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

APPENDIX B – Toxicity test data

Method TRD Client FER116 Reference 2122-1096 Chamber 3

Test Log

Day	Date	Time	Initial	Chem. Cart	Daily Data Review
0	2022/01/14	1415 *	CC/EP	1	ST
1	2022/01/15	0855	CC	-	ST
2	2022/01/16	0920	JCC	-	KCC
3	2022/01/17	1110	KTH/JCC	-	MFE
4	2022/01/18	1120	AW/CH/DW I	-	EL

Sample Information

Initial pH: 7.1
 Initial EC (µS/cm): 970
 Salinity (ppt): 1

Note: * ; time when the test was loaded with fish

Sample Pre-Aeration

Aeration rate adjusted to 6.5 +/- 1 mL/min/L: yes/no

Preaeration time 0 hours 0.5 hours 1 hour 1.5 hours 2 hours

DO(mg/L) of 100%

Temp (°C) of 100%

0.5 hours	8.8	8.8
1 hour	15	

DO in mg/L (70% - 100% saturation)**

6.2 mg/L - 8.9 mg/L at 14°C

6.1 mg/L - 8.8 mg/L at 15°C

6.0 mg/L - 8.6 mg/L at 16°C

**corrected for altitude

Test Chemistry and Biology

Conc.	CTL	6.25	12.5	25	50	100
-------	-----	------	------	----	----	-----

pH (units) (range: 5.5-8.5)

Day 0	8.0	8.1	8.1	8.0	7.9	7.6
Day 4	8.2	8.2	8.2	8.2	8.1	8.0

EC (µS/cm)

Day 0	479	505	541	606	736	986
Day 4	477	501	538	601	727	964

DO (mg/L) (70-100% saturation at test temp.)

Day 0	8.8	8.8	8.8	8.8	8.8	8.8
Day 4	8.6	8.6	8.6	8.6	8.6	8.6

Temperature (°C) (range: 14-16°C)

Day 0	15	15	15	15	15	15
Day 4	16	15	15	15	15	15

Number Alive (In brackets number stressed)

Day 0	10	10	10	10	10	10
Day 1	10	10	10	10	10	10
Day 2	10	10	10	10	10	10
Day 3	10	10	10(1)	10	10(1)	10(1)
Day 4	10	10	9	9(1)	8	10(1)

Validity Criteria: must be ≤ 10% mortality and/or stressed behavior in the control

Unless otherwise noted, behavior is considered to be normal

Control Organism Data			Test Organism Information	
Control Fish	Length (cm)	Weight (g)	Batch	
1	3.1	0.3	20211214TR	
2	3.1	0.5	Source	Smoky Trout Farm
3	3.2	0.3	Tank #	4
4	3.0	0.2	Days Held at 15± 2°C	32
5	3.2	0.3	(must be ≥14 days)	
6	3.4	0.4	Percent stock mortality	0.1
7	3.4	0.4	(7 days prior to test, must be ≤2%)	
8	3.0	0.2	Test Volume (L)	18
9	3.0	0.2		
10	3.3	0.3		

Comments :

Reviewed By: EV

Date Reviewed: 2022/01/26

APPENDIX C – Chain-of-custody form

Test Request / Chain of Custody

Reporting and Billing Information

Client: Sample:

Client / Operation: FERNIE ALPINE RESORT UTILITIES CORPORATION	
Contact: PATRICK MAJER	
Report Address: 1505 - 17TH AVENUE S.W. CALGARY, ALBERTA T2T 0E2	
Billing Address: 1505 - 17TH AVENUE S.W. CALGARY, ALBERTA T2T 0E2	
Tel 1 - 403 - 861 - 8730	Fax 1 - 403 - 244 - 3774
Quote/PO/Job	

Rush: 50% surcharge; 100% surcharge (evenings and weekends)

Tests Requested (codes on back)

(example: trout with 5 treatments, TR-D)

TR - D						Sample Received intact (y / n)
LC 50						

Notes: S = single treatment, D = multiple treatments

Check appropriate box below

x					

Sample ID	Sampled By / Date / Time	Location	Method	Type
WASTEWATER	Carter/ Jan 12, 2022 / 10:00	Fernie Alpine Resort	Grab	Effluent
2122-1095 2022/01/13 09:30 Monitorin OK 2x20L pails NoS/NoI Good Condition 11.7°C				

Relinquished By Carter Barrett	Date / Time Jan 12, 2022 / 10:00
-----------------------------------	-------------------------------------

Received By (HQ)	Date / Time

END OF REPORT



Acute Toxicity Test Results

Sample collected April 13, 2022

Final Report

May 16, 2022

Submitted to: **Fernie Alpine Resort**
Fernie, BC

SAMPLE INFORMATION

Sample ID/ Internal ID	Dates			Receipt temperature
	Collected	Received	Rainbow trout test initiation	
WASTEWATER/ 2122-1907	13-Apr-22 at 1000h	14-Apr-22 at 0900h	17-Apr-22 at 1420h	8.4°C

TEST TYPES

- Rainbow trout 96-h LC50 test

RESULTS

Toxicity test results

Sample ID	Rainbow trout LC50 (% v/v)
WASTEWATER	> 100

LC = Lethal Concentration

QA/QC

QA/QC summary	Rainbow trout
Reference toxicant LC50 (95% CL)	3.9 (3.5-4.4) g/L KCl ¹
Reference toxicant historical mean (2 SD Range)	3.3 (2.5-4.5) g/L KCl
Reference toxicant CV	9.7%
Organism health history	Acceptable
Protocol deviations	None
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

¹ Test date, April 11, 2022

LC = Lethal Concentration; CL = Confidence Limit, SD = Standard Deviation; CV = Coefficient of Variation



Report By:
Emma Pedersen, BSc
Biologist



Reviewed By:
Courtney Bogstie, P. Biol.
Senior Biologist

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APPENDIX A – Summary of test conditions

Table 1. Summary of test conditions: 96-h rainbow trout (*Oncorhynchus mykiss*) survival test.

Test species	<i>Oncorhynchus mykiss</i>
Organism source	Fish hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 - 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
Test solution renewal	None
Test temperature	15 ± 1°C
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light/8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test Measurements	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	96-hour LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

APPENDIX B – Toxicity test data

Method TRD Client FER116 Reference 2122-1907 Chamber 2

Test Log

Day	Date	Time	Initial	Chem. Cart	Daily Data Review
0	2022/04/17	1420 *	CC/DM	1	UTM
1	2022/04/18	0750	CC	-	JCS
2	2022/04/19	0900	CC	-	JCS
3	2022/04/20	0815	CC	-	JCS
4	2022/04/21	1055	EP/CC/UTM	-	MAF

Sample Information

Initial pH:	<u>7.7</u>
Initial EC (µS/cm):	<u>900</u>
Salinity (ppt):	<u>0</u>

Note: *; time when the test was loaded with fish

Sample Pre-Aeration

Aeration rate adjusted to 6.5 +/- 1 mL/min/L: yes/no
 Preaeration time: 0.5 hours
 DO(mg/L) of 100%: 9.5
 Temp (°C) of 100%: 16

DO in mg/L (70% - 100% saturation)**
6.2 mg/L - 8.9 mg/L at 14°C
6.1 mg/L - 8.8 mg/L at 15°C
6.0 mg/L - 8.6 mg/L at 16°C
**corrected for altitude

Test Chemistry and Biology

Conc.	CTL	6.25	12.5	25	50	100
-------	-----	------	------	----	----	-----

pH (units) (range: 5.5-8.5)

Day 0	<u>7.7</u>	<u>7.8</u>	<u>7.7</u>	<u>7.7</u>	<u>7.7</u>	<u>7.7</u>
Day 4	<u>8.3</u>	<u>8.3</u>	<u>8.3</u>	<u>8.2</u>	<u>8.2</u>	<u>8.2</u>

EC (µS/cm)

Day 0	<u>474</u>	<u>506</u>	<u>539</u>	<u>574</u>	<u>697</u>	<u>885</u>
Day 4	<u>415</u>	<u>459</u>	<u>491</u>	<u>521</u>	<u>618</u>	<u>802</u>

DO (mg/L) (70-100% saturation at test temp.)

Day 0	<u>8.8</u>	<u>8.9</u>	<u>8.9</u>	<u>8.8</u>	<u>8.5</u>	<u>8.6</u>
Day 4	<u>8.6</u>	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>

Temperature (°C) (range: 14-16°C)

Day 0	<u>15</u>	<u>14</u>	<u>14</u>	<u>15</u>	<u>15</u>	<u>16</u>
Day 4	<u>16</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>

Number Alive ((In brackets number stressed))

Day 0	10	10	10	10	10	10
Day 1	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
Day 2	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
Day 3	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
Day 4	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>

Validity Criteria: must be ≤ 10% mortality and/or stressed behavior in the control
 Unless otherwise noted, behavior is considered to be normal

Control Organism Data			Test Organism Information	
Control Fish	Length (cm)	Weight (g)	Batch	
1	<u>3.5</u>	<u>0.00</u>	<u>20220224TR</u>	
2	<u>3.25</u>	<u>0.00</u>	Source	<u>Troutlodge</u>
3	<u>3.3</u>	<u>0.00</u>	Tank #	<u>10</u>
4	<u>3.2</u>	<u>0.00</u>	Days Held at 15± 2°C	<u>25</u>
5	<u>3.3</u>	<u>0.00</u>	(must be ≥14 days)	
6	<u>3.6</u>	<u>0.00</u>	Mean Length (cm):	<u>3.3</u>
7	<u>3.1</u>	<u>0.00</u>	Length Range (cm):	<u>3.0-3.6</u>
8	<u>3.2</u>	<u>0.00</u>	Mean Weight (g):	<u>0.14</u>
9	<u>3.4</u>	<u>0.00</u>	(Must be ≥0.3g)	
10	<u>3.0</u>	<u>0.00</u>	Weight Range (g):	<u>0.3-0.5</u>
			Percent stock mortality	<u>0.78 cc 0.27</u>
			(7 days prior to test, must be ≤2%)	
			Test Volume (L)	<u>18</u>

Comments :

Reviewed By: SS

Date Reviewed: 2022/04/21

APPENDIX C – Chain-of-custody form

Test Request / Chain of Custody

Reporting and Billing Information

Client: Sample:

Tests Requested (codes on back)
 (example: trout with 5 treatments, TR-D)

Client / Operation:		FERNIE ALPINE RESORT UTILITIES CORPORATION	
Contact:		PATRICK MAJER	
Report Address:		1505 - 17TH AVENUE S.W. CALGARY, ALBERTA T2T 0E2	
Billing Address:		1505 - 17TH AVENUE S.W. CALGARY, ALBERTA T2T 0E2	
Tel	1 - 403 - 861 - 8730	Fax	1 - 403 - 244 - 3774
Quote/PO/Job			

TR - D						Sample Received Intact (y / n)
LC 50						

Rush: 50% surcharge; 100% surcharge (evenings and weekends)

Notes: S = single treatment, D = multiple treatments
 Check appropriate box below

Sample ID	Sampled By / Date / Time	Location	Method	Type
WASTEWATER	Carter/ April 13, 2022 / 10:00	Fernie Alpine Resort	Grab	Effluent
2122-1907 2022/04/14 09:00 Manitowin QC				
2x 20L pails Nobislab Good Condition 8.4°C				

x					

Relinquished By	Date / Time
Carter Barrett	April 13, 2022 / 10:00

Received By (HQ)	Date / Time

END OF REPORT



Acute Toxicity Test Results

Sample collected September 21, 2022

Final Report

November 2, 2022

Submitted to: **Fernie Alpine Resort**
Calgary, AB

SAMPLE INFORMATION

Sample ID/ Internal ID	Dates		Rainbow trout test initiation	Receipt temperature
	Collected	Received		
WWTP Effluent/ 2223-0240	21-Sep-22 at 1300h	22-Sep-22 at 0900	23-Sep-22 at 1550h	None

TEST TYPES

- Rainbow trout 96-h LC50 test

RESULTS

Toxicity test results

Sample ID	LC50 (% v/v)
	Rainbow trout
	LC50
WWTP Effluent	> 100

LC = Lethal Concentration

QA/QC

QA/QC summary	Rainbow trout
Reference toxicant LC50 (95% CL)	4.0 (3.5-4.4) g/L KCl ¹
Reference toxicant historical mean (2 SD Range)	3.6 (2.7-4.8) g/L KCl
Reference toxicant CV	9.4%
Organism health history	Acceptable
Protocol deviations	See Below
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

¹Test date, August 30, 2022

LC = Lethal Concentration; CL = Confidence Limit, SD = Standard Deviation; CV = Coefficient of Variation

The temperature of the sample was not measured upon receipt.

Maryam LO

Report By:
Maryam Lo, BSc
Laboratory Biologist

Leila Oosterbroek

Reviewed By:
Leila Oosterbroek, P Biol
Environmental Scientist

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APPENDIX A – Summary of test conditions

Table 1. Summary of test conditions: 96-h rainbow trout (*Oncorhynchus mykiss*) survival test.

Test species	<i>Oncorhynchus mykiss</i>
Organism source	Fish hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 - 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
Test solution renewal	None
Test temperature	15 ± 1°C
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light/8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test Measurements	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	96-hour LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

APPENDIX B – Toxicity test data

Method TRD Client FER116 Reference 2223-0240 Chamber 2

Test Log

Day	Date	Time	Initial	Chem. Cart	Daily Data Review	Sample Information
0	2022/09/23	1530	* KCRM/CDIAM	1	XC	Initial pH: / Initial EC (µS/cm): / Salinity (ppt): /
1	2022/09/24	1600	XC	-	NA	
2	2022/09/25	0830	AI	-	Kerm	
3	2022/09/26	0730	AI	-	MAF	
4	2022/09/27	1130	CD / AI	7	KB	

Note: *; time when the test was loaded with fish

Sample Pre-Aeration

Aeration rate adjusted to 6.5 +/- 1 mL/min/L (yes/no) yes

Preaeration time	0 hours	0.5 hours	1 hour	1.5 hours	2 hours
DO(mg/L) of 100%	8.6	8.6			
Temp (°C) of 100%	16				

DO in mg/L (70% - 100% saturation)**

6.2 mg/L - 8.9 mg/L at 14°C
6.1 mg/L - 8.8 mg/L at 15°C
6.0 mg/L - 8.6 mg/L at 16°C
**corrected for altitude

Test Chemistry and Biology

Conc.	CTL	6.25	12.5	25	50	100
pH (units) (range: 5.5-8.5)						
Day 0	7.5	7.6	7.6	7.6	7.6	7.9
Day 4	8.1	8.3	8.2	8.2	8.1	8.2
EC (uS/cm)						
Day 0	397	426	475	518	636	874
Day 4	395	424	474	518	637	877
DO (mg/L) (70-100% saturation at test temp.)						
Day 0	8.0	7.7	7.8	8.0	8.0	8.6
Day 4	8.8	8.8	8.8	8.8	8.8	8.8
Temperature (°C) (range: 14-16°C)						
Day 0	16	16	16	16	16	16
Day 4	15	15	15	15	15	15
Number Alive (In brackets number stressed)						
Day 0	10	10	10	10	10	10
Day 1	10	10	10	10	10	10
Day 2	10	10	10	10	10	10
Day 3	10	10	10	10	10	10
Day 4	10	10	10	10	10	10

Validity Criteria: must be ≤ 10% mortality and/or stressed behavior in the control
Unless otherwise noted, behavior is considered to be normal

Control Organism Data			Test Organism Information	
Control Fish	Length (cm)	Weight (g)	Batch	20220708TR
1	2.3	0.5	Loading Density (g/L):	0.2
2	2.5	0.4		
3	3.4	0.5	Mean Length (cm):	3.3
4	3.5	0.5		
5	3.4	0.6	Length Range (cm):	3.0-3.5
6	3.0	0.3		
7	3.1	0.4	Mean Weight (g):	0.4
8	3.4	0.4		
9	3.8	0.4	Weight Range (g):	0.3-0.6
10	3.2	0.4		
Source: Trout Lodge Tank #: 1 Days Held at 15± 2°C (must be ≥14 days): 59 Percent stock mortality (7 days prior to test, must be <2%): 0.35 Test Volume (L): 18				
Comments :				

Reviewed By: SS Date Reviewed: 2022/09/30

APPENDIX C – Chain-of-custody form

END OF REPORT
