



# 2018 SEWAGE TREATMENT PLANT ANNUAL REPORT

FERNIE ALPINE RESORT

Prepared for:

# FERNIE ALPINE RESORT

UTILITIES CORPORATION 1505-17<sup>th</sup> Avenue SW Calgary, Alberta T2T 0E2

Prepared by:

### ENVIRONMENTAL DIAGNOSTICS INC. #140, 5050 - 106<sup>TH</sup> Avenue SE

#140, 5050 – 106<sup>1H</sup> Avenue SE Calgary, Alberta T2C 5E9 Tel: (403) 212-3888 Fax: (403) 258-0580 www.environmental-diagnostics.com info@environmental-diagnostics.com

> April 30<sup>th</sup>, 2019 Report # W28001

# TABLE OF CONTENTS

		Page No.
1.0	1.1 BACKGROUND	1
2.0	REGISTRATION REQUIREMENTS2.1PARAMETERS2.2REGISTRATION LETTER OPERATING CONDITIONS2.3REPORTING REQUIREMENTS2.4SAMPLING FREQUENCY	2 2 2 3
3.0	SEWAGE FLOW RECORDS	5
4.0	SEWAGE FLOW PROJECTION	12
5.0	OVERVIEW OF ELK RIVER SAMPLE RESULTS	15
6.0	OVERVIEW OF INFLUENT TEST RESULTS	17
7.0	OVERVIEW OF EFFLUENT RESULTS 7.1 RESULTS ANALYSIS 7.2 COMPLIANCE SUMMARY	18 19 21
8.0	SLUDGE PRODUCTION AND DISPOSAL	22
9.0	BYPASS EVENTS	23
10.0	PLANT IMPROVEMENTS	24
11.0	PHOSPHOROUS REMOVAL	25
12.0	ASSESSMENT SUMMARY	28
13.0	AUTHORITIZATION AND CLOSING	29

### APPENDICES

- Table 11 Fernie Alpine Report Estimated Sewage Generation
- WWTP Registration No: 17139
- Laboratory Results
- Company Insurance

# 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 2018 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 BOD<sub>5</sub>, 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 was a slight decrease in ortho phosphorus and total phosphorus levels this year. All the results for ortho phosphorus and total phosphorus were below the MSR discharge limits. FARUC began a monitoring and Clearpac dosing investigation in the winter of 2007 to reduce effluent phosphorus 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 30<sup>th</sup>, 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:

рН	Field Sample
Temperature	Field Sample, measured in Celsius
Flow	Field Samples, measured as m <sup>3</sup> /d
BOD <sub>5</sub>	Five day biochemical oxygen demand, measured in mg/l
TSS	Total suspended solids or non filterable residue, measured in mg/l
NH <sub>3</sub>	Ammonia concentration, expressed as nitrogen in mg/l
NO <sub>3</sub>	Nitrate concentration, expressed as nitrogen in mg/l
NO <sub>2</sub>	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.

Effluent Limits						
Parameter	Limit	Unit				
Flow	1280	m <sup>3</sup> /d				
BOD <sub>5</sub>	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				

Table 1

\*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,

Ð

Page 3 of 29

- 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  $BOD_5$  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.

Deremeter	Location										
Parameter	Elk River	QTY	Influent	QTY	Effluent	QTY					
рН	WS/G	18	/	/	M/G, WS/G	25					
Temp	WS/G	18	/	/	/	/					
Flow	/	/	D/C	n/a	D/C	n/a					
BOD₅	/	/	M/G	12	M/G, WS/G	25					
TSS	WS/G	18	M/G	12	M/G, WS/G, D/C	25					
NH <sub>3</sub> -N	WS/G	18	/	/	M/G, WS/G	25					
NO <sub>3</sub> -N	WS/G	18	/	/	M/G, WS/G	25					
NO2-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					

#### Table 2 Sampling Location/Frequency/Type

### 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 plant influent and effluent flows, and compares 2018 data to previous years.

Total effluent flow from the WWTP for all of 2018 was recorded from the effluent weir type flow meter as 105,073 m<sup>3</sup> and the average was 288 m<sup>3</sup> per day. This year, the graph below shows that total effluent is very similar to the total influent for the plant.

Available monthly total effluent flow meter records for 2018 are provided in Figure 1.



Figure 1 Effluent and Influent Flow Meter Monthly Flow Totals

The ski resort operates with higher winter and late spring sewage flows than during any other period. The average daily plant flow through January, February and March of 2018 was 403 m<sup>3</sup>/day. The average daily flow was 443 m<sup>3</sup>/day in 2017, 452 m<sup>3</sup>/day in 2016, 378 m<sup>3</sup>/day in 2015, 484 m<sup>3</sup>/day in 2014, 485 m<sup>3</sup>/day in 2013, the average daily flow could not be calculated in 2012 but it was 479 m<sup>3</sup>/day for the same time period in 2011, compared to 412 m<sup>3</sup>/day over the same period in 2010.

Peak flow for the year reached 687  $m^3$ /day on December 28<sup>th</sup>, 2018, which was 46% below the allowable daily limit of 1,280  $m^3$ /day. The peak flow was lowest to date. Historical peak flows are as follows, 2017 (1,095  $m^3$ /day), 2016 (844  $m^3$ /day), 2015 (1,058  $m^3$ /day), 2014 (1,036  $m^3$ /day), 2013 (1,181  $m^3$ /day), 2012 (811  $m^3$ /day), 2011 (989  $m^3$ /day) and 2010 (823  $m^3$ /day) and 2009 (1,178  $m^3$ /day). The peak flow day occurred during the heavy ski season, which is to be expected.

A summary of sewage flow for years 2003 through 2018 is provided in Table 3 and Figures 2 and 3:

### Table 3

Voar	Sewage Flow	Davs Over				
i cai	Total	Average	Peak	Limit		
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* ( <b>122,275</b> ) <sup>1</sup>	335	989 <sup>2</sup>	0		
2012	62,509** ( <b>122,610</b> ) <sup>1</sup>	335	811 <sup>2</sup>	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		

2003 – 2018 Flow Comparisons

\* 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

(data) in brackets – estimate based on daily average

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  $m^3$ /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  $m^3$ /day down to 311  $m^3$ /day) and there were no instances where the flow exceeded the 1,280  $m^3$ /day. The peak flow increased from 2008 but is comparable to the other years.

The average flow for 2010 further decreased from 2009 (311  $m^3$ /day down to 287  $m^3$ /day) and there were no instances where the flow exceeded the 1,280  $m^3$ /day. The peak flow decreased from 2009 and is comparable to 2008.

Page 7 of 29

W28001- Fernie Alpine Resort 2018 Sewage Treatment Plant Annual Report April 2019

The average flow for 2011 had increased slightly from 2010 (287  $m^3$ /day) and 2009 (311  $m^3$ /day) and there were no instances where the flow exceeded the 1,280  $m^3$ /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  $m^3/day$ ) which had increased slightly from 2010 (287  $m^3/day$ ) and 2009 (311  $m^3/day$ ). There were no instances where the flow exceeded the registration limit of 1,280  $m^3/day$ ; however, there was no data for January and February (two out of four peak months in a year). The peak flow of 811  $m^3/day$  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 2018

The average flow for 2018 was slightly lower than in 2017 at 288 m<sup>3</sup>/day. There are no instances where the flow exceeded the plant maximum allowable flow and daily discharge of 1,280 m<sup>3</sup>/day. The peak flow has decreased significantly compared to 2017 (687 m<sup>3</sup>/day vs 1,095 m<sup>3</sup>/day) however it was similar to that of 2016.

As seen in previous years, the highest peak flow was in December; high peak flows also occurred systematically in January, February and March, which is consistent with the facility operations. The highest month in 2018 for average flows was in February, although the peak flow was observed in December.

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 approximately 70 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

Figure 4 2018 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

Page 9 of 29

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 was 67% which was an increase from previous years. The total sewage flow for 2018 was 64% which is similar to 2017.

Note that in general, there is an overall decreasing trend in % of return flow vs total water usage since 2007. 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 2018.





The impact of rainfall and snowmelt on sewage flow has decreased each year since 2007 as a result of system improvements, the use of water restrictive fixtures and the infiltration reduction program.

# 4.0 SEWAGE FLOW PROJECTION

This section shows projected wastewater flow for 2007 through 2018 based on current development plans and provides an estimate of remaining plant capacity as calculated and tabulated in the 2006 yearly report.

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  $m^3$ /day. Using the actual peak flow of 811  $m^3$ /day, a correction factor of 0.62 was calculated. Averaged correction factor for the last five years (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 and 2017 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 and 0.84 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, 2012, 2013, 2014, 2015, 2016, 2017, 2018 and 2019 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 m<sup>3</sup>/day if the flow restriction measures prove sustainable. Note that Phase 2 development may need a license amendment to increase the maximum daily flow from 1280 m<sup>3</sup> to a maximum plant capacity of 1760 m<sup>3</sup>. Sewage discharge rates will be monitored and an application will be submitted to increase the maximum daily discharge when warranted.

The 27 lots from Phase 1 were registered and eleven of the lots have been sold. None of the lots have been tied in to the sewer system yet; however, two of the lots are under construction and it is anticipated they will be tied in later this year. There are two newly built single family homes, two homes under construction and a final lot to be ready later this year located in the Snow Pines development.

Based on the 2018 flow data, the plant has an unused capacity of 593 m<sup>3</sup>/day due to the flow saving measures. This still needs to be closely monitored during 2019 and further considered when adding additional development.

Table 4 Projected Peak Flows: 2007-2019

	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 (m <sup>3</sup> /day)	1302.3	1302.3	1302.3	1302.3	1302.3	1337.6
Actual and Corrected (m <sup>3</sup> /day)	1181 (a)	1036 (a)	1058 (a)	844 (a)	1095 (a)	687 (a)

	2019
Estimated Wastewater Flow (m³/day)	1344.5
Actual and Corrected (m³/day)	1102.6 (b)

(a) actual peak flow

(b) corrected daily peak flows by the averaged correction faction for 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018 and correction factor

2007	correction factor of	1177/979.2 = 1.20
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 = 0.80
2015		1058/1302.3 = 0.81
2016		844/1302.3 = 0.65
2017		1095/1302.3 = 0.84
2018		687/1337.6 = 0.51
	AVERAGE	= 0.82

\*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  $1280 \text{ m}^3/\text{d}$ .

A graph showing estimated vs actual historical peak flows is shown below.





Year

# 5.0 OVERVIEW OF ELK RIVER SAMPLE RESULTS

This section provides data and analysis for the Elk River samples taken during 2018.

Table 5 provides a summary record of the Elk River test results for the time period from January 4<sup>th</sup>, 2018 to December 27<sup>th</sup>, 2018.

No significant changes were observed in ammonia, pH, phosphorous or nitrogen concentrations during any of the river sample periods. In general, ortho and total phosphorus was highest in the outfall but the majority of the results from down-stream were below laboratory detection limits.

Slightly elevated TSS was observed at the outfall on March 28<sup>th</sup> and April 11<sup>th</sup>. The levels in the corresponding up-stream and down-stream samples as well as the effluent samples were very low on the corresponding days.

High levels of nitrate-n (34.6 mg/L) were observed at the outfall on April 4<sup>th</sup>. The levels of nitrate-n upstream and down-stream were significantly lower (2.20 mg/L and 2.27 mg/L) on the same day. The level of nitrate-n in the effluent on April 4<sup>th</sup> was 34.4 mg/L which is consistent with other weekly samples from the plant effluent and suggests the effluent was not the cause of the elevate nitrate levels at the outfall.

Elevated levels of coliforms were observed on March 21<sup>st</sup> and December 27<sup>th</sup>. Elevated coliforms were also found in the plant effluent on March 21<sup>st</sup>. While the coliform levels at the outfall were elevated on March 21<sup>st</sup>, however, the results of the down-steam sample were lower than the levels in the up-stream sample on the same day. The results of coliforms in the plant effluent on December 27<sup>th</sup> were less than the levels found at the outfall of the Elk River. The results from the up-stream and down-stream samples were below laboratory detection limits on the same day.

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.

Sample Date		NH <sub>3</sub>			Ortho-P			Coliform		То	tal P mg	j/L
(yyyy-mm-dd)	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN
2018-01-17	0.05	0.05	0.05	0.010	0.012	0.010	1	2	1	0.020	0.020	0.020
2018-01-25	0.05	0.05	0.05	0.010	0.010	0.010	1	1	4	0.020	0.020	0.020
2018-02-01	0.05	0.05	0.05	0.010	0.073	0.010	1	1	5	0.020	0.088	0.020
2018-03-14	0.05	0.05	0.05	0.010	0.172	0.010	3	1	1	0.175	0.020	0.020
2018-03-21	0.05	0.05	0.05	0.010	0.111	0.010	18	91	9	0.020	0.116	0.020
2018-03-28	0.05	0.05	0.05	0.010	0.071	0.010	5	21	4	0.020	0.086	0.020
2018-04-04	0.05	0.05	0.05	0.010	0.182	0.010	1	5	1	0.020	0.220	0.020
2018-04-11	0.05	0.05	0.05	0.010	0.010	0.010	11	3	22	0.020	0.023	0.020
2018-04-18	0.05	0.05	0.05	0.010	0.013	0.010	1	30	2	0.020	0.022	0.020
2018-12-05	0.05	0.05	0.05	0.011	0.037	0.010	1	5	1	0.005	0.005	0.005
2018-12-12	0.06	0.05	0.05	0.010	0.020	0.020	1	11	1	0.005	0.011	0.005
2018-12-19	0.05	0.05	0.05	0.005	0.022	0.005	3	21	6	0.020	0.028	0.020
2018-12-27	0.05	0.05	0.05	0.009	0.023	0.011	1	59	1	0.005	0.018	0.005
# Samples	13	13	13	13	13	13	13	13	13	13	13	13
Average	0.05	0.05	0.05	0.010	0.058	0.010	4	19	4	0.028	0.052	0.017
Maximum	0.06	0.05	0.05	0.011	0.182	0.020	18	91	22	0.175	0.220	0.020
Minimum	0.05	0.05	0.05	0.005	0.010	0.005	1	1	1	0.005	0.005	0.005
Sample Date		TSS			рН			N-NO <sub>3</sub>			N-NO <sub>2</sub>	
(yyyy-mm-dd)	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN
2018-01-17	3.3	3.3	4.0	8.32	8.25	8.20	2.01	0.32	10.10	0.01	0.01	0.05
2018-01-25	4.7	3.0	4.7	8.35	8.25	8.36	1.95	1.66	1.97	0.01	0.01	0.01
2018-02-01	4.0	3.0	4.7	8.46	8.28	8.45	1.79	9.09	1.83	0.01	0.01	0.01
2018-03-14	5.7	3.0	5.0	8.40	8.27	8.42	1.89	14.80	1.91	0.01	0.01	0.01
2018-03-21	3.0	6.0	3.3	8.31	8.18	8.32	2.01	2.80	2.03	0.01	0.01	0.01
2018-03-28	4.7	13.3	3.3	8.25	8.05	8.25	2.09	5.95	2.16	0.01	0.01	0.01
2018-04-04	3.0	3.0	3.0	8.38	8.04	8.40	2.20	34.60	2.27	0.01	0.01	0.01
2018-04-11	7.7	11.0	9.0	8.37	8.22	8.34	1.73	0.23	1.87	0.01	0.01	0.01
2018-04-18	5.3	6.7	7.3	8.38	8.28	8.38	1.57	0.20	1.73	0.01	0.01	0.01
2018-12-05	3.0	3.0	4.0	8.44	8.34	8.43	1.68	2.52	1.66	0.01	0.01	0.01
2018-12-12	4.7	3.0	3.0	5.56	4.88	8.32	2.10	0.12	2.08	0.01	0.01	0.01
2018-12-19	3.0	6.0	3.0	8.41	8.25	8.39	1.88	0.17	1.73	0.01	0.01	0.01

Tal	<u>ole 5</u>
2018 Elk River	Sample Results

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

8.33

13

8.35

8.45

8.20

1.91

13

1.91

2.20

1.57

0.28

13

5.60

34.60

0.12

1.86

13

2.55

10.10

1.66

0.01

13

0.01

0.01

0.01

0.01

13

0.01

0.01

0.01

0.01

13

0.01

0.05

0.01

8.20

13

7.96

8.34

4.88

UP – Upstream

2018-12-27

# Samples

Average

Maximum Minimum 3.0

13

4.2

7.7

3.0

3.0

13

5.2

13.3

3.0

3.0

13

4.4

9.0

3.0

8.35

13

8.15

8.46

5.56

IDZ – Initial Dilution Zone

DN – Downstream

# 6.0 OVERVIEW OF INFLUENT TEST RESULTS

This section provides data and analysis for the plant influent (raw sewage) samples taken during 2018.

Table 6 provides a summary record of the influent test results for the period January 4<sup>th</sup>, 2018 to December 27<sup>th</sup>, 2018.

Data	2018 Influent Results Summary							
Date	Flow	Temp	рΗ	TSS	BOD	COD		
(yyyy/mm/dd)	m³/d	С		mg/L	mg/L	mg/L		
2018-01-04	482	-8.0	7.53	306.0	237.0	-		
2018-01-10	343	-12.0	7.69	136.0	114.0	-		
2018-01-17	226	-3.0	7.88	254.0	234.0	-		
2018-01-25	288	0.0	8.11	176.0	117.0	-		
2018-02-01	485	-7.0	8.03	148.0	103.0	-		
2018-03-14	360	-5.0	8.00	238.0	99.0	-		
2018-03-21	325	0.0	7.87	196.0	83.0	-		
2018-03-28	492	2.0	7.51	113.0	97.0	-		
2018-04-04	261	-6.0	8.16	194.0	143.0	-		
2018-04-11	344	3.0	7.97	66.3	37.0	-		
2018-04-18	486	2.0	8.17	45.3	28.9	-		
2018-05-23	131	11.0	8.20	75.2	65.0	-		
2018-07-26	312	18.0	7.77	238.0	149.0	-		
2018-08-16	234	11.0	7.86	167.0	86.0	-		
2018-10-25	154	11.0	8.06	61.0	39.0	-		
2018-12-05	152	-8.0	7.89	66.7	42.0	-		
2018-12-12	220	0.0	9.79	48.0	42.0	-		
2018-12-19	519	0.0	7.72	98.8	65.0	-		
2018-12-27	517	-9.0	7.34	298.0	157.0	-		
# Samples	19	19	19	19	19	0		
Average	333	0.0	8.0	154.0	102.0	-		
High	519	18	10	306	237	0		
Low	131	-12	7	45	29	0		

#### Table 6 2018 Influent Results

A total of 19 BOD and TSS samples were analyzed. Inlet BOD ranged from 28.9 mg/l to 237.0 mg/L with an average of 102.0 mg/L. The average influent sewage strength was measured at 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 waste water BOD is in the range of 250 mg/L, it is assumed that the average BOD is still below the expected level.

# 7.0 OVERVIEW OF EFFLUENT RESULTS

This section provides data and analysis for the effluent (treated) samples and plant flows for 2018.

A total of 384 effluent samples were collected and analyzed for TSS, 19 out of 384 samples were laboratory tested for BOD5, ortho phosphate, total phosphate, fecal coliforms and 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 2018.

Data	2018 Effluent Results Summary											
Date	Flow	Temp	NH <sub>3</sub> -N	BOD	COD	P-OP04	Coliforms	Total P	TSS	рΗ	NO <sub>3</sub> -N	NO <sub>2</sub> -N
(yyyy/mm/dd)	m³/d	С	mg/L	mg/L	mg/L	mg/L	cfu/100ml	mg/L	mg/L		mg/L	mg/L
2018-01-04	460	-8.0	0.052	4.7	35	0.362	800	0.626	4.0	7.52	40.6	0.034
2018-01-10	355	-12.0	0.050	2.0	16	0.220	11	0.279	3.0	7.97	36.6	0.050
2018-01-17	244	-3.0	0.050	2.0	10	0.079	2	0.099	3.0	7.97	35.1	0.050
2018-01-25	300	0.0	0.050	2.0	12	0.090	7	0.097	3.0	7.98	36.2	0.050
2018-02-01	494	-7.0	0.050	2.0	12	0.196	1	0.225	4.0	8.06	29.2	0.050
2018-03-14	380	-5.0	0.050	2.0	10	0.270	2	0.282	3.0	8.04	35.0	0.050
2018-03-21	350	0.0	0.050	2.0	17	0.703	800	0.751	3.0	7.97	14.3	0.050
2018-03-28	513	2.0	0.050	2.0	13	0.485	48	0.537	3.0	7.64	34.2	0.050
2018-04-04	280	-6.0	0.050	2.0	16	0.184	1	0.207	3.0	8.06	34.4	0.075
2018-04-11	364	3.0	0.050	2.0	10	0.205	1	0.223	3.0	8.08	25.3	0.050
2018-04-18	503	2.0	0.050	2.0		0.220	17	0.248	3.0	8.27	11.4	0.050
2018-05-23	132	11.0	0.050	2.0	-	0.166	1	0.382	3.0	8.08	35.7	0.050
2018-07-26	341	18.0	0.050	2.0	-	0.225	9	0.305	3.0	7.90	18.1	0.050
2018-08-16	250	11.0	0.050	4.1	-	0.184	6	0.295	3.0	8.33	17.9	0.015
2018-10-25	143	11.0	0.050	2.0	-	0.269	1	0.380	3.0	8.32	2.0	1
2018-12-05	187	-8.0	0.050	2.0	10	0.132	1	0.005	3.0	8.22	21.4	0.021
2018-12-12	193	0.0	0.050	2.0	10	0.152		0.219	3.0	8.00	27.9	0.050
2018-12-19	534	0.0	0.050	2.0	10	0.335	6	0.445	3.0	8.09	21.2	0.010
2018-12-27	517	-9.0	0.050	2.0	18	0.262	48	0.335	3.0	7.83	31.3	0.010
# Samples	19	19	19	19	15	19	19	19	19	19	19	19
Average	344	0	0.05	2.3	14	0.249	98	0.3	3	8.02	26.7	0.09
High	534	18	0.05	4.7	35	0.703	800	0.8	4	8.33	40.6	1.00
Low	132	-12	0.05	2.0	10	0.079	1	0.0	3	7.52	2.0	0.01
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	2	0	0	N/A	N/A	N/A

#### Table 7 2018 Effluent Results

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

### 7.1 RESULTS ANALYSIS

The average BOD in the effluent was 2.3 mg/L, which was similar to the previous years. Historically, the average BOD was <2.0 mg/L in 2016, 2014, 2013, 2012, 2011, 2010, 2009 and it was 2.2 mg/L in 2015.



Laboratory tests indicated TSS samples averaged <3.0 mg/L with all but two of the results being below laboratory detection limits. The plant measured TSS on a daily basis. All the results measured at the plant were below the discharge limit. The highest result measured at the plant was recorded on February 20<sup>th</sup> at 2.8 mg/L with an average throughout the year of 0.2 mg/L. The plant provides excellent BOD<sub>5</sub> and TSS treatment with average removals of 100%.

Figure 9 Historical TSS Test Results for Influent vs Effluent



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 recreational waters for the year for all but two days. The levels of coliforms were 800 cfu/100 mL on January 4<sup>th</sup> and March 21<sup>st</sup> and the levels exceeded the acceptable limit. The results for the weeks following the elevated results were low (11 cfu/100 mL and 48 cfu/100 mL respectively) and well below the acceptable limit of 200 cfu/100 mL for recreational water. The levels of coliforms were not tested in the Elk River on January 4<sup>th</sup>; however, they were tested in the Elk River on March 21<sup>st</sup>. The results on March 21<sup>st</sup> were slightly elevated (18 cfu/100 mL upstream, 91 cfu/100 mL at the outfall and 9 cfu/100 mL at the down-stream) with respect to the other weeks; however the results were well below the acceptable limit for recreational water indicating there were no measurable impact of the effluent discharge on the river.

Effluent ammonia concentrations are consistently low. 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 was the case in previous years, the bioassay toxicity tests in 2018 shows that plant effluent is nontoxic. The results of these tests are shown below in Table 8.

T-1-1- 0

Toxicity Test Results							
Sample Date	Result						
2017/12/27*	Pass						
2018/04/25	Pass						
2018/12/27	Pass						

\*Please note two trout tests were completed in the calendar year for 2018; however, one test was completed at the very end of December 2017. As the test was close to the 2018 year, it was included in both the 2017 report and this report.

The level of ortho phosphorus exceeded the allowable limit on March 21<sup>st</sup> at 0.703 mg/L vs the allowable limit of 0.5 mg/L. All the other ortho phosphorus results were below the allowable limit. All the total phosphorus levels were below the discharge limits for 2018.

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 virtually identical. 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

2018 MSR Parameter Compliance										
Parameter	Unit	MSR Limit No. of Samples		Average Value	Max. Value	Samples Over Limit				
Flow	m <sup>3</sup> /day	1280	365	288	687	0				
BOD₅	mg/l	45	19	2.3	4.7	0				
TSS	mg/l	45	384	1.6	4.0	0				
Total Phosphorous	mg/l	1	19	0.3	0.8	0				
Ortho Phosphate	mg/l	0.5	19	0.249	0.703	1				
Fecal Coliforms*	cfu/100ml	200	19	98	800	2				
96 hr LC <sub>50</sub> Bioassay	/	Non-toxic	3.0	/	/	0				

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

Coliforms exceeded the allowable limit on two days and ortho phosphorus exceeded the allowable limit on one day for 2018. All the remaining parameters were below the discharge limits for 2018.

### 8.0 SLUDGE PRODUCTION AND DISPOSAL

This section provides data regarding the disposal of bio-solids (sludge) from the treatment facility in 2018.

Operation of the 200 m<sup>3</sup> aerated sludge digester allowed the plant to bag and landfill all of its biosolids 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.

Month	Vol. Bagged (m³)
January	112.9
February	166.2
March	185.3
April	151.5
Мау	103.1
June	85.0
July	95.9
August	108.3
September	174.2
October	101.3
November	43.7
December	116.6
Total	1.444.0

Table 10 2018 Bagged Solids Data

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 2018.

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 though 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 2018.

# **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 RCR will continue along with minimization of the potable water use ie clear well water will be used to spray down the clarifiers instead of potable water.

There were no major plant improvements in 2018.

# 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 14<sup>th</sup>, 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 5<sup>th</sup> and 16% on December 27<sup>th</sup>. 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 phosphours and 9% for total phosphorus. The exceedances for ortho phosphorus were observed on January 3<sup>rd</sup>, January 17<sup>th</sup>, January 23<sup>rd</sup>, February 26<sup>th</sup>, July 30<sup>th</sup> and December 26<sup>th</sup>. The exceedance for total phosphorus was observed on January 3<sup>rd</sup>.

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 21<sup>st</sup>. The exceedance for total phosphorus was observed on January 16<sup>th</sup>.

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 1<sup>st</sup>, 3% on January 7<sup>th</sup> and 19% on December 22<sup>nd</sup>.

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 28<sup>th</sup> and for total phosphorus was it 23% on December 28<sup>th</sup>.

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  $21^{st}$  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.









# 12.0 ASSESSMENT SUMMARY

The plant has produced high quality effluent with  $BOD_5$  normally below the regulated limit of 45 mg/l and for all but two instances, the results were less than 2 mg/L (on January 4<sup>th</sup>, BOD was measured at 4.7 mg/L and on August 16<sup>th</sup>, BOD was measured at 4.1 mg/L). TSS was less than laboratory detection limit for all but two samples (on January 4<sup>th</sup> and February 2<sup>nd</sup>, TSS was measured at 4.0 and mg/L). Both TSS and BOD were below the MSR limits.

Nitrogen (ammonia-n, nitrate-n and nitrite-n) results indicate that the plant functioned well again in 2018.

Generally, elevated coliform levels in the effluent did coincide with elevated levels found in Elk River at the outfall; however the levels in the down-stream sample was less than the up-stream sample on the same day. High levels of TSS were found in Elk River on March 28<sup>th</sup> and April 11th. The levels in the effluent were below laboratory detection limits on same days. Elevated levels of nitrate were also found in the Elk River on two occasions and low levels were found in the effluent on the same days. There does not appear to be any adverse impacts to the Elk River from the effluent discharged.

The results for coliforms exceeded the discharge limits on January 4<sup>th</sup> and March 21<sup>st</sup> and the result for ortho phosphorus exceeded the discharge limits on March 21<sup>st</sup>. All the remaining parameters were below the discharge limits for 2018.



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.

A new subdivision has been approved and is currently under construction (Timberlanding). A capacity report from Urban Systems has been 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). The second phase includes the remaining 21 single family lots and 2 multifamily lots, each with a maximum density of approximately 56 units. Please note the first phase also includes 4 infill lots on Lower Timberline Crescent.

Analysis shows capacity in the WWTP for the first phase of development but likely an increase to the maximum allowable daily discharge will be required for 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 1760m<sup>3</sup>. In order to utilize this capacity, a license amendment to increase the maximum daily flow from 1280 m<sup>3</sup> to 1760 m<sup>3</sup> will be required. The facility operators will have to monitor flows closely and ensure this application happens in a timely fashion.

# **13.0 AUTHORITIZATION AND CLOSING**

This report, titled 2018 Sewage Treatment Plant Annual Report, was prepared for FARUC by Environmental Diagnostics Inc. The material in this report reflects the best judgement of Environmental Diagnostics 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. Environmental Diagnostics 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.

### ENVIRONMENTAL DIAGNOSTICS INC.

Kim Harvey, B. Sc., P.Chem. Environmental Consultant

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

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



J:jobs/water/2019/W28001/Fernie/Wastewater/2018Annual Report

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

Disking Development   University   2021	I=			-				-				-
-   (µµµk)   Unit   Constrain (µkky)   Constrain (µkky) <td>Existing Development</td> <td>Flow*</td> <td></td> <td>2011</td> <td>2012</td> <td>2013</td> <td>2014</td> <td>2015</td> <td>2016</td> <td>2017</td> <td>2018</td> <td>2019</td>	Existing Development	Flow*		2011	2012	2013	2014	2015	2016	2017	2018	2019
Back m.   1138   46   0.11 <t< td=""><td>p</td><td>(l/unit/day)</td><td>Units</td><td>Generation (m3/day)</td><td>Generation (m3/day)</td><td>Generation (m3/day)</td><td>Generation (m3/day)</td><td>Generation (m3/day)</td><td>Generation (m3/day)</td><td>Generation (m3/day)</td><td>Generation (m3/day)</td><td>Generation (m3/day)</td></t<>	p	(l/unit/day)	Units	Generation (m3/day)								
Varia Dom   318   42   114   11	Griz Inn	1136	45	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1
Concention   118   28   285   2	Wolf's Den	318	42	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4
Insterior conde   0000   000   000	Cornerstone	1136	26	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
Part Part Part Part Part Part Part Part	Timberline Condos	1022	58	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3
Protect super analy a bade   1036   5   665   665   665   665   665   665   665   665   665   665   665   665   665   665   665   665   665   665   665   7264 <th< td=""><td>Polar Peaks (4-Plex Units)</td><td>1136</td><td>24</td><td>27.3</td><td>27.3</td><td>27.3</td><td>27.3</td><td>27.3</td><td>27.3</td><td>27.3</td><td>27.3</td><td>27.3</td></th<>	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
State   State <th< td=""><td>Timberline Single Family &amp; B&amp;B</td><td>1363</td><td>51</td><td>69.5</td><td>69.5</td><td>69.5</td><td>69.5</td><td>69.5</td><td>69.5</td><td>69.5</td><td>69.5</td><td>69.5</td></th<>	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
Hill Unix   Flow*   Quinking   Units   Generation (mbbg)   Generation (mbbg) <th< td=""><td></td><td>Subtotal</td><td>246</td><td>250.1</td><td>250.1</td><td>250.1</td><td>250.1</td><td>250.1</td><td>250.1</td><td>250.1</td><td>250.1</td><td>250.1</td></th<>		Subtotal	246	250.1	250.1	250.1	250.1	250.1	250.1	250.1	250.1	250.1
Initi Units   (Flow"   2011   2012   2014   2015   2016   2016   2017   2018   Control (m)/day)   Contro (m)/day)   Contro (m)/day)												
With Units   Outcome Link   Generation (m3dsy)   Generation (m3dsy) </th <th></th> <th>Flow*</th> <th></th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th>		Flow*		2011	2012	2013	2014	2015	2016	2017	2018	2019
Timebering Bringhow   1022   114   1441   1411   1411 <th>Infili Units</th> <th>(I/unit/dav)</th> <th>Units</th> <th>Generation (m3/dav)</th> <th>Generation (m3/dav)</th> <th>Generation (m3/day)</th> <th>Generation (m3/day)</th> <th>Generation (m3/dav)</th> <th>Generation (m3/day)</th> <th>Generation (m3/day)</th> <th>Generation (m3/day)</th> <th>Generation (m3/day)</th>	Infili Units	(I/unit/dav)	Units	Generation (m3/dav)	Generation (m3/dav)	Generation (m3/day)	Generation (m3/day)	Generation (m3/dav)	Generation (m3/day)	Generation (m3/day)	Generation (m3/day)	Generation (m3/day)
Transmissing Family   1953   2   2.7	Timberline Infills	1022	141	144.1	144.1	144.1	144.1	144.1	144.1	144.1	144.1	144.1
Trinsbering Inflis   1022   106   1063 <td>Timberline Single Family</td> <td>1363</td> <td>2</td> <td>27</td> <td>27</td> <td>27</td> <td>27</td> <td>27</td> <td>27</td> <td>27</td> <td>27</td> <td>27</td>	Timberline Single Family	1363	2	27	27	27	27	27	27	27	27	27
The betaching (Multianity)   1922   145   100<	Timberline Infills	1022	106	108.3	108.3	108.3	108.3	108.3	108.3	108.3	108.3	108.3
Trade-tools Stope Fams/n   1133   1935   1	Timberlanding Multifamily	1022	45	60.0	60.0	60.0	60.0	60.0	60.0	60.0	46.0	46.0
Integration of the term   1022   252   263 <td>Timberlanding Single Eamily<sup>1)</sup></td> <td>1362</td> <td></td> <td>44.3</td> <td>44.3</td> <td>14.3</td> <td>14.3</td> <td>44.3</td> <td>00.0</td> <td>00.0</td> <td>40.0</td> <td>40.0</td>	Timberlanding Single Eamily <sup>1)</sup>	1362		44.3	44.3	14.3	14.3	44.3	00.0	00.0	40.0	40.0
Internation   Dock	Highling Infill	1003	09.0	44.3	44.3	44.3	44.3	44.3	44.3	44.3	01.1	01.1
Biologic State		1022	20	20.0	20.0	20.0	20.0	20:0	20.0	20.0	20.0	20.0
Highine Subdivision   Flow* (funitary   Units   2011 Generation (m3/day)   2012 Generation (m3/day)   2013 Generation (m3/day)   2014 Generation (m3/day)   2016 Generation (m3/day)   2017 Generation (m3/day)   2016 Generation (m3/day)   2017 Generation (m3/day)   2016 Generation (m3/day)   2017 Generation (m3/day)   2017 Generation (m3/day)   2016 Generation (m3/day)   2017 Generation (m3/day)   2016 Generation (m3/day)   2017 Generation (m3/day)   2016 Generation (m3/day)   2017 Generation (m3/day) <t< td=""><td></td><td>Suptotal</td><td>379.5</td><td>386.0</td><td>386.0</td><td>386.0</td><td>386.0</td><td>386.0</td><td>386.0</td><td>386.0</td><td>408.8</td><td>408.8</td></t<>		Suptotal	379.5	386.0	386.0	386.0	386.0	386.0	386.0	386.0	408.8	408.8
Highin Subdivision   Flow*   Units   2011   2012   2013   2014   2015   2016   2016   2017   2018   2019     Single Family   1383   56   6668   668	i <del></del>											
"   (Multidy)   Unity   Generation (m3/day)	Highline Subdivision	Flow*		2011	2012	2013	2014	2015	2016	2017	2018	2019
Single Family   1963   54   66.8	5	(l/unit/day)	Units	Generation (m3/day)								
Duplexes   1363   10   136   13	Single Family	1363	54	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	73.6
Parcel 31 Condotel   118   61   119.4	Duplexes	1363	10	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6
Parcel 3:Objekz   166   21.6   21.8   21.6	Parcel 31-Condotel	318	61	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4
Parcel 36-Hotel   318   101   32.1   33.1	Parcel 32-Duplex	1363	16	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8
Parcel 37-Tombouses   1363   8   10.9	Parcel 36-Hotel	318	101	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
Parel 38-Townhouses   1583   2.23   3.1.3 <td>Parcel 37-Townhouses</td> <td>1363</td> <td>8</td> <td>10.9</td> <td>10.9</td> <td>10.9</td> <td>10.9</td> <td>10.9</td> <td>10.9</td> <td>10.9</td> <td>10.9</td> <td>10.9</td>	Parcel 37-Townhouses	1363	8	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9
Parcel 3-Condomium   1363   12   16.4 <td>Parcel 38-Townhouses</td> <td>1363</td> <td>23</td> <td>31.3</td> <td>31.3</td> <td>31.3</td> <td>31.3</td> <td>31.3</td> <td>31.3</td> <td>31.3</td> <td>31.3</td> <td>31.3</td>	Parcel 38-Townhouses	1363	23	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3
Parcel 8-Condominum   1363   4.2   5.7.2	Parcel 3-Condominium	1363	12	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4
Subtoal   Subtoal <t< td=""><td>Parcel 8-Condominium</td><td>1363</td><td>42</td><td>57.2</td><td>57.2</td><td>57.2</td><td>57.2</td><td>57.2</td><td>57.2</td><td>57.2</td><td>57.2</td><td>57.2</td></t<>	Parcel 8-Condominium	1363	42	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2
Bay Users   Flow' ((un)tidday)   Population (each)   Ceneration (m3/day)   C		Subtotal	327	269.5	269.5	269.5	269.5	269.5	269.5	269.5	269.5	276.4
Day Users   Flow' (U/unit/day)   Population (ach)   2011   2012   2013   2014   2015   2016   2017   2018   2019     Skiers   36   700   252   253   53   53   53												
Day Users   (I/uni/Iday)   Generation (m3/day)   Gener		Flow*	Population	2011	2012	2013	2014	2015	2016	2017	2018	2019
Skiers   36   700   252   253   253   53   53   53   53   53   53   53   53   53   53   53   53	Day Users	(I/unit/day)	(each)	Generation (m3/day)	Generation (m3/day)	Generation (m3/day)	Generation (m3/day)	Generation (m3/dav)	Generation (m3/day)	Generation (m3/day)	Generation (m3/day)	Generation (m3/day)
Subtail   700   252   253   53	Skiers	36	700	252	252	252	252	252	252	252	252	252
Flow   Area   2016   2016   2016   2017   2018   2019   Generation (m3/day)   Generation (m3/d		Subtotal	700	252	252	252	252	252	252	252	252	252
Dining Facilites/BarsFlow* ( $l/m^2/day)$ Area (m2)201120122013201420152016201720182019Lizard Creek - Dining975.475.35		oustotal	100	201	LUL	LUL	LUL	202	LUL	LUL	LUL	LUL
Dining Facilities/Bars   Flow (l/m <sup>2</sup> /day)   Area (l/m <sup>2</sup> /day)	Ir	Flowt	Area	2011	2012	2012	2014	2015	2016	2017	2019	2010
(Im.7day)   (Im.2)   Ceneration (ms/day)   Generation	Dining Facilites/Bars		Area ( 0)	2011	2012	2013	2014	2013	2010	2017	2010	2019
Lzard Creek - Dining 97 54.7 5.3		(l/m²/day)	(m2)	Generation (m3/day)								
Lzard Creek Bar 145 40.4 5.9 <td>Lizard Creek - Dining</td> <td>97</td> <td>54.7</td> <td>5.3</td> <td>5.3</td> <td>5.3</td> <td>5.3</td> <td>5.3</td> <td>5.3</td> <td>5.3</td> <td>5.3</td> <td>5.3</td>	Lizard Creek - Dining	97	54.7	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Kelseys-Dining   97   2044   19.8	Lizard Creek - Bar	145	40.4	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Kelseys-Bar   145   65   9.4	Kelseys - Dining	97	204.4	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
Daylodge - Dining   97   358.6   34.8	Kelseys - Bar	145	65	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Dayloge-Bar   145   260.7   37.8	Daylodge - Dining	97	358.6	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8
Mean Bean   97   26.8   2.6   2	Daylodge - Bar	145	260.7	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8
Gabrielles   97   13.8   13	Mean Bean	97	26.8	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Powder House Inn   97   23.2   22.5	Gabrielles	97	133.8	13	13	13	13	13	13	13	13.0	13.0
Bears Den   97   62.4   6.1   6	Powder House Inn	97	232.2	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Subtotal   1439   157.2   <	Bears Den	97	62.4	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

Daily Wastewater Flow (m3/day)*	1302.3	1302.3	1302.3	1302.3	1302.3	1302.3	1302.3	1337.6	1344.5
Corrected Daily Peak Flow Projections**	989 (actual)	811***(actual)	1181 (actual)	1036 (actual)	1058 (actual)	844 (actual)	1095 (actual)	687 (actual)	1102.6 (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 Timberlanding in 2018



Date: September 30, 2002

Our File: RE 17139

### REGISTERED MAIL

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

Resorts of the Canadian Rockies Inc. 1507 – 17<sup>th</sup> Avenue, SW Calgary Alberta TZT OE2

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 8980, 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 RE 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. Rees will be calculated using a maximum effluent flow of 1280  $m^3/day$ , a maximum BOD<sub>5</sub> 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 *Ac*. 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 registration and this letter is a violation of the *Act* and may result in prosecution.

Ministry of Water, Land end Air Protection

Kootansy Region

Malling/Location Address: 401 • 383 Vistoria Bireot Nelson BC VIL 4X3

Telephone: 260 354-5833 Fecsimile: 250 854-68332 PF Facsimile:250 354-6867

08/13/03 WED 16:27 [TX/RX NO 8432]

2

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/epd/epdpa/mpp/msrhome.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 sawage 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 suthorized 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 authorise entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorised 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 cut 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.
- Environmental Impact Study, Sewage Treatment Plant at Femie Alpine Resort, prepared for Femie Alpine Resort Ltd. by Highwood Environmental Management Limited dated April 2001.
- Environmental Impact Study for Fernie Alpine Resort's Wastewater Discharge into the Elk River, Interim Report prepared by Conor Pacific Environmental Technologies Incorporated dated May 1 2001
  - May 1, 2001.
- Femie 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.

#### <u>**Treatment Plant Works</u>**</u>

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 Rik 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 m<sup>3</sup>/day. The effluent quality shall be BOD<sub>3</sub> of <u>45 mg/L</u>, TSS of <u>45 mg/L</u>, total phosphorus of <u>1.0 mg/L</u>, ortho phosphate <u>0.5 mg/L</u> and the effluent shall also pass a 96 hour LC50 bioassay test.

### Primary Screenings and Dewatered Blosslids (Sludge) Dispessi

Primary screenings and dewatered biosolids (aludge) from the treatment plant shall be disposed at the Crowsnest/Pincher Creek Landfill. The discharger shall submit confirmation of acceptance of the screenings and biosolids by the Crowsnest/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 Crowsnest/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.

4

### 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.

### **<u><b>Qutfall Diffuser**</u>

The discharger shall install an outfall diffuser in accordance with Part 4, Section 5 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.

#### **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 6 of the *Regulation* subject to the requirements as follows:

E cluck she
#### Sampling and Analysis

••

2

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	( phus )
Nitrate	5 µg/L	~/ <b>#</b> ~/
Nitrite	$2 \mu g/L$	
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:

, 6

#### Sampling Location Frequency/Type

	Elk River <sup>4</sup> (At Sites UP, IDZ and DN)	Plant Influent <sup>3</sup>	Plant Effluent <sup>3</sup>
Parameter	·····		
pH (field test)	WS/G	-	M/G and WS/G
temperature (field test)	WS/G		
flow,		D/CON.	D/CON.
BOD <sub>5</sub> <sup>1</sup>	<u> </u>	M/G	M/G and WS/G
TSS <sup>2</sup>	W8/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	1	M/G and WS/G
total phosphorus	WS/G		M/G and WS/G
	Elk River <sup>4</sup> (At Sites UP, IDZ and DN)	Piant Influent <sup>3</sup>	Plant Effluent <sup>3</sup>
orthophosphata	W\$/G		M/G and WS/G
AINALINALMAN	11 10/ 54	-	
fecal coliforms	WS/G		M/G and WS/G
Toxicity			3Y/G

1. BOD<sub>5</sub> - means the total 5-day blochemical 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.

08/13/03 WED 16:27 [TX/RX NO 6432]

2

, 6

Sampling Location Frequency/Type

	Elk River <sup>4</sup> (At Sites UP, IDZ and DN)	Plant Influent <sup>3</sup>	Plant Effluent <sup>3</sup>
Parameter	······································		
pH (field test)	WS/G	·	M/G and WS/G
temperature (field test)	WS/G		
flow,		D/CON,	D/CON.
BOD <sub>5</sub> <sup>1</sup>		M/G	M/G and WS/G
TSS <sup>2</sup>	W8/G	M/G	M/G and WS/G and D/CON.
ammonia (aa nitrogen)	WS/G		M/G and WS/G
nitrate (as nitrogen)	WS/G		M/G and WS/G
nitrite (as nitrogen)	WS/G	1	M/G and WS/G
total phosphorus	WS/G	1	M/G and WS/G
	Elk River <sup>4</sup> (At Sites UP, IDZ and DN)	Piant Influent <sup>3</sup>	Plant Effluent <sup>3</sup>
orthophosphate	WS/G		M/G and WS/G
fecal coliforms	WS/G		M/G and WS/G
Toxicity	+		3Y/G

1. BOD<sub>5</sub> - 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.

08/13/03 WED 16:27 [TX/RX NO 6432]

7

#### 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 sessions 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.

#### **Bavironmental Monitoring System (BMS) Numbers**

The following are the EMS site numbers assigned to the monitoring sites listed above. These numbers are to be used when entoring data directly into the Ministry BMS 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.

RECEIVED

007 - 3 2002

# URBANSISTEMS LID

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.

9

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.Bng. Assistant Regional Waste Manager

Лp

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

08/13/03 WED 16:27 [TX/RX NO 6432]



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 14-DEC-17 Report Date: 20-DEC-17 14:44 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2035300 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - WINTER 2017 EMS WEEK 1 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

FARUC - WINTER 2017 EMS WEEK 1

L2035300 CONTD.... PAGE 2 of 5 Version: FINAL

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 13-DEC-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	72	DLHC	70	mg/L		14-DEC-17	R3916764
Total Suspended Solids	114	DLHC	6.0	mg/L		18-DEC-17	R3916119
рН	7.83		0.10	pН		14-DEC-17	R3913876
L2035300-2 WWTP EFFLUENT							
Sampled By: HB on 13-DEC-17 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		14-DEC-17	R3913494
Biochemical Oxygen Demand	<2.0		2.0	mg/L		14-DEC-17	R3916764
Chemical Oxygen Demand	15		10	mg/L		15-DEC-17	R3914319
Orthophosphate-Dissolved (as P)	0.399		0.010	mg/L		15-DEC-17	R3913925
Coliform Bacteria - Fecal	<1		1	CFU/100mL		14-DEC-17	R3914265
Phosphorus (P)-Total	0.430		0.020	mg/L	15-DEC-17	16-DEC-17	R3914585
Total Suspended Solids	<3.0		3.0	mg/L		18-DEC-17	R3916119
	7.88		0.10	рН		14-DEC-17	R3913876
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N) Nitrate (as N)	31.5	DLHC	0.10	mg/L		15-DEC-17	R3914494
Nitrate+Nitrite				5			
Nitrate and Nitrite (as N)	31.5		0.11	mg/L		18-DEC-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLHC	0.050	mg/L		15-DEC-17	R3914494
L2035300-3 ELKRIVER UPSTREAM							
Sampled By: HB on 13-DEC-17 @ 14:30							
Matrix: WATER							
Miscellaneous Parameters							<b>D a a a a a</b>
Ammonia, Total (as N)	<0.050		0.050	mg/L		14-DEC-17	R3913494
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		15-DEC-17	R3913925
Comorni Baciena - Fecal	/		1	CFU/100mL		14-DEC-17	R3914265
Total Supported Solida	<0.020		0.020	mg/L	13-DEC-17	10-DEC-17	R3914565
n H	< 3.0		3.0	nig/∟		14 DEC 17	R3910119
NO2, NO3 (BC codes) and Sum of NO2/NO3	0.32		0.10	pri		14-DEC-17	K3913070
Nitrate (as N)							
Nitrate (as N)	1.87		0.020	mg/L		15-DEC-17	R3914494
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.87		0.050	mg/L		18-DEC-17	
Nitrite in Water by IC	-0.010		0.010	ma/l		15-DEC-17	P2014404
	<0.010		0.010	ing/∟		13-020-17	K3914494
L2U3U3UU-4 ELNKIVEK UUIFALL Sampled By: HB on 13-DEC 17 @ 14:45							
Miscellaneous Parameters							
Ammonia. Total (as N)	<0.050		0.050	ma/l		14-DEC-17	R3913494
Orthophosphate-Dissolved (as P)	0.014		0.010	ma/L		15-DEC-17	R3913925
Coliform Bacteria - Fecal	<1		1	CFU/100mL		14-DEC-17	R3914265
Phosphorus (P)-Total	<0.020		0.020	mg/L	15-DEC-17	16-DEC-17	R3914585
Total Suspended Solids	<3.0		3.0	mg/L		18-DEC-17	R3916119
·				, , , , , , , , , , , , , , , , , , ,			

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 13-DEC-17 @ 14:45							
Matrix: WATER							
рН	8.06		0.10	рН		14-DEC-17	R3913876
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N) Nitrate (as N)	0.331		0.020	ma/L		15-DEC-17	R3914494
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.331		0.050	mg/L		18-DEC-17	
Nitrite in water by IC Nitrite (as N)	<0.010		0.010	mg/L		15-DEC-17	R3914494
L2035300-5 ELKRIVER DOWNSTREAM							
Sampled By: HB on 13-DEC-17 @ 15:00							
Matrix: WATER							
MISCEIIAneous Parameters	~0.050		0.050	ma/l		14-DEC-17	R3013/0/
Orthophosphate-Dissolved (as P)	<0.050		0.050	ma/L		15-DEC-17	R3913925
Coliform Bacteria - Fecal	32		1	CFU/100mL		14-DEC-17	R3914265
Phosphorus (P)-Total	<0.020		0.020	mg/L	15-DEC-17	16-DEC-17	R3914585
Total Suspended Solids	<3.0		3.0	mg/L		18-DEC-17	R3916119
pH NO2 NO2 (BC and so and Sum of NO2/NO2	8.31		0.10	рН		14-DEC-17	R3913876
Noz, Nos (BC codes) and sum of Noz/Nos Nitrate (as N)							
Nitrate (as N)	1.90		0.020	mg/L		15-DEC-17	R3914494
Nitrate+Nitrite	1.00		0.050	mall		19 DEC 17	
Nitrite in Water by IC	1.90		0.050	ing/∟		10-DEC-17	
Nitrite (as N)	<0.010		0.010	mg/L		15-DEC-17	R3914494

#### Sample Parameter Qualifier Key:

DLHC       Detection Limit Raised: Dilution required due to high concentration of test analyte(s).         MS-B       Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.         Test Method References:         ALS Test Code       Matrix       Test Description       Method Reference**         BOD-BC-CL       Water       Biochemical Oxygen Demand (BOD)       APHA 5210 B-5 day IncubO2 electrode         This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous								
MS-B       Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.         Test Method Reference:       Matrix       Test Description       Method Reference**         BOD-BC-CL       Water       Biochemical Oxygen Demand (BOD)       APHA 5210 B-5 day IncubO2 electrode         This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous								
Test Method Reference:         ALS Test Code       Matrix       Test Description       Method Reference**         BOD-BC-CL       Water       Biochemical Oxygen Demand (BOD)       APHA 5210 B-5 day IncubO2 electrode         This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous								
ALS Test CodeMatrixTest DescriptionMethod Reference**BOD-BC-CLWaterBiochemical Oxygen Demand (BOD)APHA 5210 B-5 day IncubO2 electrodeThis analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous								
BOD-BC-CLWaterBiochemical Oxygen Demand (BOD)APHA 5210 B-5 day IncubO2 electrodeThis analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous								
This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous								
This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceou BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.								
COD-T-COL-CL Water Chemical Oxygen Demand (COD) APHA 5220 D Colorimetry								
The Chemical Oxygen Demand (COD) test is used to estimate the amount of organic matter in the water. The sample is added to COD tubes, which contain a premixed volume of reagents. The sample is then heated for two hours on the COD reactor with a strong oxidizing agent, potassium dichromate. The COD reagents also contain silver and mercury ions. Silver is used as a catalyst and mercury is used to complex chloride interference. Oxidizable organic compounds react, reducing the dichromate ion to green chromic ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is measured colormetrically and a decrease in absorbance at 420 nm is proportional to the COD. Samples with concentrations > 150 mg/L can be diluted into the linear range.								
FCC-MF-CL Water Fecal Coliform Count-MF APHA 9222D								
This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level.								
N2N3-CALC-CL Water Nitrate+Nitrite CALCULATION								
NH3-F-CL Water Ammonia by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC								
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.								
NO2-BC-IC-CL Water Nitrite in Water by IC EPA 300.0								
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.								
NO3-BC-IC-CL Water Nitrate (as N) EPA 300.0								
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.								
P-T-COL-ED Water Total P in Water by Colour APHA 4500-P PHOSPHORUS								
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.								
PH-CL Water pH APHA 4500 H-Electrode								
pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)								
PO4-DO-COL-ED Water Diss. Orthophosphate in Water by Colour APHA 4500-P PHOSPHORUS								
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.								
TSS-CL Water Total Suspended Solids APHA 2540 D-Gravimetric								
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.								
** ALS test methods may incorporate modifications from specified reference methods to improve performance.								

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

#### Test Method References:

ALS Test Code	Matrix	<b>Test Description</b>	Method Reference**
Chain of Custody Numb	ers:		

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review. 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, Fr

L2035300-COFC

. . . . . . .

Q11

#### CHAIN OF CUSTODY FORM

Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-

Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Yoft Free: 1-8

Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Fr

Sasketoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1

SEND	REPO	ORT	<u>ro:</u>			00000			PATRICK MAJER		UYS	IS R	EQUI	STE	D:											
COMP	ANY:	_	F	ERNIE ALPINE RESC		-	RATION	ATTN:					<u> </u>			1			T	l l				1.		•
ADDF	ESS		1:	505 - 17TH Avenue S	outh East					-	ļ												Anl	21'5)		
CITY:			С	ALGARY	PROV	ALBER	TA	POSTAL CODE:		+					1	ļ										
TEL:			-   ·	1 - 800 - 258 - 7669	FAX	403 - 2	44 - 3774	SAMPLER:	Hungry Baytaluke	-		1									Ì	,	ωr	r fe	wy	
PRO.	IECT !	NAME	E AN	DNO: FARUC	- Winter 2017	EMS we	æk 1	QUOTE NO:		-							1						·	100	. 1	
PO N	0.:		ſ		ALS C	ONTACT:	Lydmyla Shvets(	@ALSGlobal.co	m	4 '						1				1 I			$\sim$	> _		
							- 1\/  /	<u>p naje i@skire</u>	<u>cr.com</u>	-																
REP(	ORT F	ORM	AT:			<u>⊢</u> _		<u>    (     )   </u>	••	Colifor			L	ا م	_	z	z .					┝				
<u> </u>	WO	#	٦				DATE / TIME	COLLECTED	MATRIX	Cal.	ŝ		Ê	otal	E -	ŝ	8	ö   g	3				comment	ts, due date	ss, elc.)	
				SAMPLE ID			YYYY-MM-DD	TIME		- <u> </u> "	Ĕ	ā	0	Éł	2	z	z	╩┼┶	<u></u>	+		- t	.emp =	Pli	50	
	<u> </u>	1	7	WWTP Influent Routin	ne .	1	2017-12-13	14:00	Water		×			-+		-+		<del>_</del>		+	╞╼┽	-  t	.emp =	4.t	ナ。	
		+-	(†	WWTP influent BOD		2	2017 12 13	14:00	Water		<u> </u>	$\left  - \right $				-+	-+	<u>-</u> +-		┼──	┞─┤					
'			┓								-	<u> </u> '	<u> </u>		-		-+		<del>,  </del>	+	╂──┼					
			1	WWTP Effluent Routi	ne	3	2017-12-13	14:15	Water		X	×				+-		-+	<u>-</u>	╂──	╀━─┼			11,	10	
		_ 1	4	WWTP Effluent BOD		4	2017-12-13	14:15	Water				<u> </u> '				_	<u>×</u>			┼─┤	<u>⊢</u> -†		<del>                                     </del>		
•	┝╾ᡧ	$\mathcal{H}$	┥	WAA/TP Effluent Nutri	ent –	5	2017-12-13	14:15	Water				×	X	X	<u>×</u>  -	×				┼─┤	┝─╋		4-5		
	'		Н	MAA/TE Effluent Bacti		6	2017-12-13	14:15	Water	×								_			┼──┤	<b>└──┼</b>			<u>~</u>	
	-	<u> </u>	4					1													┼─┥	┼╼╉				
Ę	<u> </u>					7	2017-12-13	14:30	Water		X	X				└──╁			:	<u> </u>	┾─┤	╞──┨	temp =	_A+	$\frac{1}{2}$	
Ī	L	<u> </u>	4	Elknver Opstram Rot	4	-7	2017-12-13	14:30	Water		Τ		х	x	х	×	x					┼╌┦	temp =	-++-/	느러	
- IS	Ľ	5	Ц	Elkriver Upstream No		<u>»</u>	2017 12 13	14:30	Water	X	1		T	Ţ							<u> </u>	┢──┨	temp =	Ver		1
A8	L		V	Elkriver Upstream Ba		7	2011-12 10				1			l		T (			_				<u> </u>			l
۲ ۲						10	0017 10 13	14:45	Water	-	X	X					-						temp ≃	-		4
12			L.	Elkriver Outfall Routi	ne	10	2017-12-13	14-46	Water		┦─		X	X	X	×	х						temp =	╢_	C	l
	Ū	λI		Elkriver Outfall Nu	trient	<u>  </u>	2017-12-13	14.40	Water	- <del> </del> _	+-		1-	1-					_		Τ		temp =	$\nabla_{i}$	C	
	Γ	1	C	Elkriver Outfall Bacti		(2)	2017-12-13	3 14:45		-+-		┼╼						i			1					
	<b>—</b>										- <u> </u> -	×	-			-				1	1		temp =	Λ	$a^{-c}$	
	$\square$		1	Elkriver downstream	Routine /	3	2017-12-13	3 15:00	. vvater		+	<u>+-</u> ^	X	×	x	×	x			+	$\top$		temp =	71	₹ <u></u> _	
	T	-	1-	Elkriver downstream	Nutrient	14_	2017-12-13	3 15:00	Water				+	+^	+^	+^	<u> </u>	┝─┤		+	-	+	temp =	V.	ノ。	1
	H	5	て	Elkriver downstream	Bacti	15	2017-12-13	3 15:00	Water	<u>L</u> *	<u>+</u> -	+-		┥╌	╆──	┨───		┼╌┤		+		+	<u> </u>			]
	-	<u> </u>										+-							2017-	12-1			BY:	DATE:	2/11/2	1917
┢		_	_				SPECIFY DATI	E:	(surcharge may apply)			RE					<u> </u>	JATE:		5 00 n		R		TIME:	1:06	1
π	IRN A	ROU	NDF	REQUIRED:		1 .	-					H_	JNĢR	T BA				IME:			- AFC		D 8Y:	DATE:		1
¢1		NVOI	E T		$\overline{\Delta}$	Ы		┝╸┝╸				RE		JISHE	D BY:			DATE			-			TIME		1
				╤╤╤╤┥╔╜┓	HT			ŀ							00 0		<u> </u>	TIME:								1
				JCTIONS: PLEA	SE FAX A COP	Y OF TH	E RESULTS TO 2	250-423-4652 (	DR E-MAIL TO			F		AB U			Sam	inie Te	mperatu	re: Z	_•c	Coo	ling Meth	od?		]
	2014	- A40		waste	water@skifemi	e.com							XVes	eerint N	laut? Io	N/A	Froz	ren?	Yes_	No		$\underline{\lambda}$	icepacks	ice	None	1
																	<u> </u>					4				1 C1 4 C



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 22-DEC-17 Report Date: 03-JAN-18 16:45 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2038730 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - WINTER 2017 EMS WEEK 2 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

FARUC - WINTER 2017 EMS WEEK 2

L2038730 CONTD.... PAGE 2 of 5 Version: FINAL

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 20-DEC-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	153	DLHC	75	mg/L		22-DEC-17	R3921889
Total Suspended Solids	248	DLHC	9.0	mg/L		27-DEC-17	R3922275
рН	7.81		0.10	pН		23-DEC-17	R3919263
L2038730-2 WWTP EFFLUENT							
Sampled By: HB on 20-DEC-17 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-DEC-17	R3925667
Biochemical Oxygen Demand	<2.0		2.0	mg/L		22-DEC-17	R3921889
Chemical Oxygen Demand	<10		10	mg/L		02-JAN-18	R3928227
Orthophosphate-Dissolved (as P)	0.325		0.010	mg/L		23-DEC-17	R3918968
Coliform Bacteria - Fecal	1		1	CFU/100mL		22-DEC-17	R3923816
Phosphorus (P)-Total	0.337		0.020	mg/L	29-DEC-17	30-DEC-17	R3925591
Total Suspended Solids	<3.0		3.0	mg/L		27-DEC-17	R3922275
	8.08		0.10	рН		23-DEC-17	R3919263
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N)	35.7	DLHC	0.10	ma/L		22-DEC-17	R3927009
Nitrate+Nitrite			0110				
Nitrate and Nitrite (as N)	35.7		0.11	mg/L		02-JAN-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLHC	0.050	mg/L		22-DEC-17	R3927009
L2038730-3 ELKRIVER UPSTEAM							
Sampled By: HB on 20-DEC-17 @ 14:30							
Matrix: WATER							
Miscellaneous Parameters						00 DE0 17	
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-DEC-17	R3925667
Onnophosphate-Dissolved (as P)	0.023		0.010	mg/L		23-DEC-17	R3918968
Comorni Bacteria - Fecal	-0.020		1	CFU/100mL	20 DEC 17	22-DEC-17	R3923816
Total Suspended Solids	<0.020		0.020	mg/L	29-DEC-17	30-DEC-17	R3923391
	< 3.0		0.10	nig/∟		27-DEC-17	R3922275
NO2, NO3 (BC codes) and Sum of NO2/NO3	0.01		0.10	PLI		20-020-17	13313203
Nitrate (as N)							
Nitrate (as N)	1.98		0.020	mg/L		22-DEC-17	R3927009
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.98		0.050	mg/L		02-JAN-18	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	ma/l		22-DEC-17	R3927009
	<0.010		0.010	iiig/ E			1(3527005
Sampled By: HB on 20-DEC-17 @ 14:45							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-DEC-17	R3925667
Orthophosphate-Dissolved (as P)	0.025		0.010	mg/L		23-DEC-17	R3918968
Coliform Bacteria - Fecal	<1		1	CFU/100mL		22-DEC-17	R3923816
Phosphorus (P)-Total	0.026		0.020	mg/L	29-DEC-17	30-DEC-17	R3925591
Total Suspended Solids	<3.0		3.0	mg/L		27-DEC-17	R3922275

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2U38730-4 ELKKIVEK UUTFALL Sampled By: HB on 20-DEC-17 @ 14:45							
Matrix: WATER							
pH	8.46		0.10	Hq		23-DEC-17	R3919263
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N)							
Nitrate (as N)	2.63		0.020	mg/L		22-DEC-17	R3927009
Nitrate and Nitrite (as N)	2.63		0.050	mg/L		02-JAN-18	
Nitrite in Water by IC				Ū			
Nitrite (as N)	<0.010		0.010	mg/L		22-DEC-17	R3927009
L2038730-5 ELKRIVER DOWNSTREAM							
Sampled By: HB on 20-DEC-17 @ 15:00							
Matrix: WATER Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	ma/L		30-DEC-17	R3925667
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		23-DEC-17	R3918968
Coliform Bacteria - Fecal	1		1	CFU/100mL		22-DEC-17	R3923816
Phosphorus (P)-Total	<0.020		0.020	mg/L	29-DEC-17	30-DEC-17	R3925591
Total Suspended Solids	4.7		3.0	mg/L		27-DEC-17	R3922275
pH	8.44		0.10	рН		23-DEC-17	R3919263
NO2, NO3 (BC codes) and Sum of NO2/NO3 Nitrate (as N)							
Nitrate (as N)	2.03		0.020	mg/L		22-DEC-17	R3927009
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	2.03		0.050	mg/L		02-JAN-18	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		22-DEC-17	R3927009

#### **Qualifiers for Sample Submission Listed:**

Qualifier	Description		
EXTEMP10	11C - Sample	s Received with temperature >10 Degrees C	
EHR	FCC - Exceed	led Recommended Holding Time prior to receip	ot at the lab.
Sample Param	eter Qualifier Key:		
Qualifier	Description		
DLHC	Detection Limit Raise	d: Dilution required due to high concentration of	of test analyte(s).
MS-B	Matrix Spike recovery	could not be accurately calculated due to high	analyte background in sample.
Test Method R	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
	\\/_t	Discharging Damand (DOD)	ADUA 5040 D.5. day lacyth. O0 alectrode
BOD-BC-CL	vvater	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day Incub02 electrode
dissolved oxyge BOD (CBOD) is	l (BOD) are determined n meter. Dissolved BOI determined by adding a	by diluting and incubating a sample for a spec D (SOLUBLE) is determined by filtering the sar a nitrification inhibitor to the diluted sample price	ified time period, and measuring the oxygen depletion using a mple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
The Chemical C contain a premix dichromate. The Oxidizable organ measured colorr into the linear ra	Dxygen Demand (COD) xed volume of reagents e COD reagents also co nic compounds react, re metrically and a decreas ange.	test is used to estimate the amount of organic . The sample is then heated for two hours on the ontain silver and mercury ions. Silver is used as educing the dichromate ion to green chromic io se in absorbance at 420 nm is proportional to t	matter in the water. The sample is added to COD tubes, which the COD reactor with a strong oxidizing agent, potassium a catalyst and mercury is used to complex chloride interference. In. For samples in the 10 - 150 mg/L range the remaining Cr6+ is the COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is Coliform bacterii involves an initia bacteria (Fecal)	carried out using proce a is enumerated by cult al 24 hour incubation at and is used for non-tur	dures adapted from APHA Method 9222 "Mem turing and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriat bid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". Jume is filtered through a 0.45 micron membrane filter. The test e growth medium. This method is specific for thermotolerant
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is of Chemistry, "F al.	carried out, on sulfuric a flow-injection analysis w	acid preserved samples, using procedures mo vith fluorescence detection for the determinatio	dified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society n of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-BC-IC-CL	Water	Nitrite in Water by IC	EPA 300.0
This analysis is detected by UV	carried out using proce absorbance.	dures adapted from EPA Method 300.0 "Deter	mination of Inorganic Anions by Ion Chromatography". Nitrite is
NO3-BC-IC-CL	Water	Nitrate (as N)	EPA 300.0
This analysis is detected by UV	carried out using proce absorbance.	dures adapted from EPA Method 300.0 "Deter	mination of Inorganic Anions by Ion Chromatography". Nitrate is
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate dige	carried out using proce estion of the sample.	dures adapted from APHA Method 4500-P "Ph	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determine hold time from ti	d in the laboratory using ime of sampling (field a	g a pH electrode. All samples analyzed by this nalysis is recommended for pH where highly a	method for pH will have exceeded the 15 minute recommended ccurate results are needed)
PO4-DO-COL-E	D Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using proce	dures adapted from APHA Method 4500-P "Ph been lab or field filtered through a 0.45 micron	osphorus". Dissolved Orthophosphate is determined membrane filter.

TSS-CL Water Total Suspended Solids

APHA 2540 D-Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

#### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

#### **Chain of Custody Numbers:**

#### GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

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

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

**ALS Environmental** 

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-66! Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-66 Fort McMurray AB, Bay 1, 245 Mecdonald Cr. T9H 485, Tel: 780-791-1524 Fax: 780-7 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel; 780-413-5227 Toll Free: 1-800-665 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-t



#### CHAIN OF CUSTODY FORM

SEN	D REP	ORT T	o:				····	CHAIN OF (	cus	TO	DY	FO	RM			_					<u> </u>	AUE .
CON	IPANY	:	FERNIE AL	FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN. PATRICK MAJER							SIS R	EQU	EST	ED:							<b></b>	
ADO	RESS:		1505 - 17Th	+ Avenue South	East				_	-												
ст	4:		CALGARY	Y PROV. ALBERTA		POSTAL CODE:	T2T 0E2														Ambiel !	
TEL			t - 800 - 25		FAX: 403 - 2	44 - 3774	SAMPLER:	Hungry Baytaluke														-21
PRC	JECT	NAME	AND NO.:	FARUC-W	/inter 2017 EMS we	eek 2 HIS	OUOTE NO:			ļ												anr - 7
POI	v0.:		1		ALS CONTACT:	Lydrnyla Shvets	@ALSGlobal.com	m		1												,
		-				- 1\ /1 /	phajet@skire	r.com						Ì								
REP	ORT F	ORMA	T:						E E												i İ	
								·	- Š			a.	٩	z	z	z տ						
	wo	#		SAMPLE (DENTIF	ICATION	DATE / TIME	COLLECTED	MATRIX	ecal	SS		oft.	otal	Ë	β	00						NOTES (sample specific comments, due dates, etc.)
				MAA(TO Influent Pourties /		YYYY-MM-DD	11ME	18/stor	<u> </u>	<u>⊢</u> -	<u>+</u>	0		2	<u>z</u>	2 1		<u>+</u>	+	╀╴╴┫		
		<u> </u>	WWTP Infl	uent Routine	1	2017-12-20	14.00	18(stor		Ê	$\vdash$		_		- †		<u>.                                    </u>		+	┤─┦		
	L		WWTP Infl	uent BOD	U	1 2017-12-20	14:00	wwater			$\left  \right $						·	+	<u>+</u>	╆╌┼		
	<u> </u>		<u> </u>		~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		4445	18/ptor	+								-+-	+		┼─┤		
			WWTP Eff	uent Routine		2017-12-20	14:15	vvater		<u>⊢</u>	Ĥ			_			<u>_</u>  _^	-	+	┼╼┽		
	$ \square $	-+	WWTP Eff	uent BOD	4	2017-12-20	14:15	vvater				~	~	-	÷		<u>`</u> -		┼──	┼╌┽		$\frac{mp}{m} = \frac{1}{100} 1$
	ĽŦ	_\_	WWTP Eff	uent Nutrient	<u> </u>	2017-12-20	14:15	VVater	+-	-	$\vdash$	<u>^</u>	^	_	-	<u> </u>	+	+		$\left  \right $		$\frac{mp}{\sqrt{2}} = \frac{1}{\sqrt{2}}$
		- \	WWTP Eff	uent Bacti	<u> </u>	2017-12-20	14:15	Water	<u>×</u>		$\left  \right $				-+				┥──	┢╍┼	1e/	mp=///C
Ľ											<b> </b>			_	_					┢──┤	_ <b>-</b>  -	
ð			Elkriver Up	stram Routine	<u> </u>	2017-12-20	14:30	Water		X	X					.		-	–	┥┥	ter	$\frac{np}{c}$
JSL JSL	4	31	Elkriver Up	stream Nutrient	8	2017-12-20	14:30	Water	<b>_</b>			<u>×</u>	_ <u>×</u>	X	X	<u>×</u>	_	_		$\vdash$	ter	$\frac{mp}{p} = \frac{p}{p} = \frac{p}{p}$
AB 1		<u> </u>	Elkriver Up	stream Bacti	9	2017-12-20	14:30	Water	×		<u> </u>							<u> </u>		$\downarrow$	ter	mp= v v C
с В																		_		$\square$		
5 0		1	Elkriver Ou	tfall Routine	10	2017-12-20	14:45	Water		X	×			_						$\square$	ter	$np = \frac{n}{n}
	$\square$	م (	Elkriver O	utfall Nutrient	10	2017 <del>-</del> 12 - 20	14:45	Water				<u>×</u>	Х	х	Х	×					ter	np= // C
			Elkriver Ou	itfall Bacti	12	- 2017- 12 - 20	14:45	Water	×	<u> </u>					_						ter	$\pi p = (V_1 O_1 C_1)$
																	_					
		_ /	Elkriver do	wnstream Routir	ne (3	2017 12 20	15:00	Water		X	X				_						ter	np = C
		£t	Elkriver do	wnstream Nutrie	int 14	2017- 12 - 20	15:00	Water				х	X	х	х	x					ter	mp=//C°C
		>	Elkriver do	wnstream Bacti	15	2017-12-20	15:00	Water	X						_						ter	$np = \sqrt{J}$ C
	$\vdash$																					
⊢	1					SPECIFY DATE	:	(surcharge may apply)			RELI	NQUIS	SHED	BY:		DA <sup>-</sup>	re:	017-1	2-20	RECE	IVED BY	DATE: 22-126-17
TU	RN AR	OUND	REQUIRED:							_	HUN	GRY	BAY	TALU	KE	TIN	(E:	5:	00 pm	N	NM	TIME: 9-20-
SE		OICE 1	ro:			THE		RF			RELI	NQUIS	SHED	BY:		DA'	TE:	_		RECE	IVED BY	DATE:
INV	OICE										ТІМЕ					TIME:						
SP	ECIAL	INSTR	UCTIONS:	PLEASE FAX	A COPY OF THE	RESULTS TO 25	0-423-4652 OR	E-MAIL TO			FOR LAB USE ONLY								,	<u> </u>		
1	_			wastewater@	skifernie.com						Cool	er Sea	al Intac	ct?		Sample	Temp	erature:	<u> </u>	°C (	Cooling P	Aethod?
											<u></u>	'es	_No	"N	I/A	Frozen	<u> </u>	es	_No	}	<pre>/_icepa</pre>	ckslceNone

G JOUALITY JOD\_DOCUMENTS/10\_AUTHOR/ZED/FORMS/Hungry's CoC for ALS Juli EMS xis



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 28-DEC-17 Report Date: 05-JAN-18 15:55 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2039659 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - WINTER 2017 EMS WEEK 3 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

FARUC - WINTER 2017 EMS WEEK 3

L2039659 CONTD.... PAGE 2 of 5 Version: FINAL

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 27-DEC-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	267		2.0	mg/L		29-DEC-17	R3928698
Total Suspended Solids	380	DLHC	15	mg/L		02-JAN-18	R3928051
рН	7.93		0.10	pН		29-DEC-17	R3925307
L2039659-2 WWTP EFFLUENT							
Sampled By: HB on 27-DEC-17 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-DEC-17	R3925667
Biochemical Oxygen Demand	<2.0		2.0	mg/L		29-DEC-17	R3928698
Chemical Oxygen Demand	16		10	mg/L		05-JAN-18	R3929399
Orthophosphate-Dissolved (as P)	0.173		0.010	mg/L		29-DEC-17	R3925095
Coliform Bacteria - Fecal	64		1	CFU/100mL		28-DEC-17	R3926968
Phosphorus (P)-Total	0.213		0.020	mg/L	02-JAN-18	03-JAN-18	R3928417
Total Suspended Solids	<3.0		3.0	mg/L		02-JAN-18	R3928051
pH	8.20		0.10	pН		29-DEC-17	R3925307
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N) Nitrate (as N)	45.0	HTD	0.10	mg/L		03-JAN-18	R3927696
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	45.0		0.10	mg/L		03-JAN-18	
Nitrite (as N)	<0.010		0.010	ma/L		28-DEC-17	R3927696
1 2039659-3 ELKRIVER UPSTREAM				5			
Sampled By: HB on 27-DEC-17 @ 14:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-DEC-17	R3925667
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		29-DEC-17	R3925095
Coliform Bacteria - Fecal	1		1	CFU/100mL		28-DEC-17	R3926968
Phosphorus (P)-Total	<0.020		0.020	mg/L	02-JAN-18	03-JAN-18	R3928417
Total Suspended Solids	<3.0		3.0	mg/L		02-JAN-18	R3928051
рН	7.68		0.10	pН		29-DEC-17	R3925307
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N)	0.00		0.000				D0007000
Nitrate (as N)	2.03		0.020	mg/L		28-DEC-17	R3927696
Nitrate+Nitrite (as N)	2 03		0.050	ma/l		02-JAN-18	
Nitrite in Water by IC	2.00		0.000			02 0/ 11 10	
Nitrite (as N)	<0.010		0.010	mg/L		28-DEC-17	R3927696
L2039659-4 ELKRIVER OUTFALL							
Sampled By: HB on 27-DEC-17 @ 14:45							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-DEC-17	R3925667
Orthophosphate-Dissolved (as P)	0.091		0.010	mg/L		29-DEC-17	R3925095
Coliform Bacteria - Fecal	21		1	CFU/100mL		28-DEC-17	R3926968
Phosphorus (P)-Total	0.114		0.020	mg/L	02-JAN-18	03-JAN-18	R3928417
Total Suspended Solids	4.0		3.0	mg/L		02-JAN-18	R3928051
				L			

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 27-DEC-17 @ 14:45							
Matrix: WATER							
pH	7.88		0.10	рН		29-DEC-17	R3925307
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N)	21.3		0.020	mg/L		28-DEC-17	R3927696
Nitrate+Nitrite	04.0		0.050			00 14 14 40	
Nitrate and Nitrate (as N)	21.3		0.050	mg/L		02-JAN-18	
Nitrite (as N)	0.013		0.010	mg/L		28-DEC-17	R3927696
L2039659-5 ELKRIVER DOWNSTREAM							
Sampled By: HB on 27-DEC-17 @ 15:00							
Matrix: WATER Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-DEC-17	R3925667
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		29-DEC-17	R3925095
Coliform Bacteria - Fecal	<1		1	CFU/100mL		28-DEC-17	R3926968
Phosphorus (P)-Total	<0.020		0.020	mg/L	02-JAN-18	03-JAN-18	R3928417
pH	3.3 8.20		3.0 0.10	nig/∟ nH		02-JAN-10 29-DEC-17	R3926051
NO2, NO3 (BC codes) and Sum of NO2/NO3	0.20		0.10	P			10020007
Nitrate (as N)	1.00		0.000				Baaazaaa
Nitrate (as N)	1.99		0.020	mg/L		28-DEC-17	R3927696
Nitrate and Nitrite (as N)	1.99		0.050	mg/L		02-JAN-18	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		28-DEC-17	R3927696

#### Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Raise	d: Dilution required due to high concentration	n of test analyte(s).
HTD	Hold time exceeded for	or re-analysis or dilution, but initial testing wa	as conducted within hold time.
Test Method R	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is oxygen demand dissolved oxyge BOD (CBOD) is	carried out using procee (BOD) are determined n meter. Dissolved BOI determined by adding a	dures adapted from APHA Method 5210B - " by diluting and incubating a sample for a spo D (SOLUBLE) is determined by filtering the s a nitrification inhibitor to the diluted sample p	Biochemical Oxygen Demand (BOD)". All forms of biochemical ecified time period, and measuring the oxygen depletion using a ample through a glass fibre filter prior to dilution. Carbonaceous rior to incubation.
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
The Chemical C contain a premis dichromate. The Oxidizable organ measured colorr into the linear ra	Dxygen Demand (COD) ked volume of reagents. COD reagents also co nic compounds react, re metrically and a decreas inge.	test is used to estimate the amount of organ The sample is then heated for two hours or ntain silver and mercury ions. Silver is used educing the dichromate ion to green chromic se in absorbance at 420 nm is proportional to	ic matter in the water. The sample is added to COD tubes, which in the COD reactor with a strong oxidizing agent, potassium as a catalyst and mercury is used to complex chloride interference. ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is to the COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is Coliform bacteri involves an initia bacteria (Fecal)	carried out using procee a is enumerated by cult al 24 hour incubation at and is used for non-turk	dures adapted from APHA Method 9222 "Me uring and colony counting. A known sample 44.5 degrees C of the filter with the appropri bid water with a low background bacteria leve	embrane Filter Technique for Members of the Coliform Group". volume is filtered through a 0.45 micron membrane filter. The test ate growth medium. This method is specific for thermotolerant el.
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is of Chemistry, "F al.	carried out, on sulfuric a low-injection analysis w	acid preserved samples, using procedures m ith fluorescence detection for the determinat	nodified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society tion of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-BC-IC-CL	Water	Nitrite in Water by IC	EPA 300.0
This analysis is detected by UV	carried out using procee absorbance.	dures adapted from EPA Method 300.0 "Det	ermination of Inorganic Anions by Ion Chromatography". Nitrite is
NO3-BC-IC-CL	Water	Nitrate (as N)	EPA 300.0
This analysis is detected by UV	carried out using procee absorbance.	dures adapted from EPA Method 300.0 "Det	ermination of Inorganic Anions by Ion Chromatography". Nitrate is
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate dige	carried out using procee estion of the sample.	dures adapted from APHA Method 4500-P "I	Phosphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determine hold time from ti	d in the laboratory using ime of sampling (field a	g a pH electrode. All samples analyzed by th nalysis is recommended for pH where highly	is method for pH will have exceeded the 15 minute recommended accurate results are needed)
PO4-DO-COL-E	D Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using proceed on a sample that has b	dures adapted from APHA Method 4500-P "I been lab or field filtered through a 0.45 micro	Phosphorus". Dissolved Orthophosphate is determined n membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is (TSS) are deterr	carried out using procee mined by filtering a sam	dures adapted from APHA Method 2540 "So ple through a glass fibre filter, and by drying	lids". Solids are determined gravimetrically. Total suspended solids the filter at 104 deg. C.
** ALS test metho	ods may incorporate mo	difications from specified reference methods	s to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

#### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Chain of Custody Num	bers:		

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review. ALS Environmental

ANALYTICAL CHEMISTRY & TESTING SERVICES

SEND REPORT TO:



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188, Toll Free: 1-800-865-0242, E-+- 551 555 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fa;



L2039659-COFC

#### CHAIN OF CUSTODY FORM

Grand Prairie AB, 9595 - 111 Street, T8V SW1, Tel: 780-539-5196 Toll Free: 1-81 Fort McMurray AB, Bay 1, 245 Macdonald Cr. T9H 4B5, Tel: 780-791-1524 Fax; i Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800

Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370, Toll Free: 1-8

SEN	D REPORT TO	0:						CUS	sių	DY	FO	RM	ļ	<u> </u>	-						P,	AGE	OF	
сом	IPANY:	FERNIE AL	ERNIE ALPINE RESORT UTILITIES CORPORATION				PATRICK MAJER	AN	ALY	SIS F	REQI	JEST	ED:									-		
ADD	RESS:	1505 - 17TH Avenue South East							Ι													1	Γ	1
СПУ	·:	CALGARY PROV ALBERTA			POSTAL CODE:	T2T 0E2														1	4.1	150	$\mathcal{H}$	
TEL:		1 - 800 - 25	58 - 7669	FAX: 403 -	244 - 3774	SAMPLER:	Hungry Baytaluke	7													$\square$	NM2	Xe	W
PRO	JECT NAME A	AND NO.:	FARUC-W	inter 2017 EMS v	veek 3	QUOTE NO:															0	lee . I	10	. 0
PON	10.:			ALS CONTAC	T: Lydmyla Shvets	@AL\$Globai.com	າ	1													Ľ	W	qe	mp
REP							r.com	Juns 1													-	-7	Æ	Ś
⊢	WO#	1					<u></u>	Ū –			٩	a.	7	-	-						_ <b> </b> -			
		5	SAMPLE IDENTIFI	CATION			MATRIX	eca	ŝ	н	l fe	otal	Ξ	6	8	ö	8			-		NOTES ( comments	sample : due dat	apecific es, etc.)
h		WWTP Influ	Jent Routine	1	2017-12-27	14.00	Water	<u>ц</u>	×	L Ω X	0	-1	z	z.	<u>z</u>	<u> </u>	<u>0</u>	$\rightarrow$						
		WWTP Influ	Jent BOD	2	2017-12-27	14:00	Water		-							$\mathbf{x}$						$\frac{mp}{mn} = 1$	F	
													·			<u>_</u> +		+	-	+		inp - 7	<u> </u>	
		- WWTP Effi	uent Routine	3	2017-12-27	14:15	Water	+	x	x					· · · · · · · · · · · · · · · · · · ·	+	x	$\rightarrow$		-+		-mo =		
		WWTP Efflu	uent BOD	<u> </u>	2017-12-27	14:15	Water	1-								x			-				74	
		WWTP Effi	uent Nutrient	5	2017-12-27	14:15	Water				x	<u>.</u> Х	x	x	x					+	te		$\leftarrow +$	
		WWTP Efflu	uent Bacti	6	2017-12-27	14:15	Water	x		-		-					-+	+-	+	+	te		!	c
<u>≻</u>						~~~~	<u> </u>												+	$\rightarrow$				
NO		Elkriver Ups	tram Routine	-Fr	2017-12-27	14:30	Water		x	x								_	-+		te	mp = /		c c
ВĽ		Elkriver Ups	tream Nutrient		2017-12-27	14:30	Water	-	-		x	x	х	x	x	-			-+	+	te	mp = //	-7	 
ģ		Elkriver Ups	stream Bacti	G	2017-12-27	14:30	Water	×	-										+	+	te		ラ	
ר צ	د		· · · · · · · · · · · · · · · · · · ·					1	1										-+	+			<u> </u>	
5		Elkriver Out	fall Routine	$\neg v$	2017- 12 - 27	14:45	Water		x	x						Ť.			-	+	te		<u>ר (</u>	<u>)</u> c
		Elkriver Ou	utfall Nutrient	11	2017 12 27	14:45	Water				х	х	x	х	x				-	-+	te	mp= /	/-₹	1 c
		Elkriver Out	fall Bacti	12	2017- 12 - 27	14:45	Water	×							-			-			te			<b>c</b>
																	1		$\neg$					{
		Elkriver dow	instream Routine	.13	2017- 12 - 27	15:00	Water		х	х	_		-							-	te			c
		Elkriver dow	nstream Nutrient	14	2017-12-27	15:00	Water				x	×	x	х	x				-+		te	mp = /	17	) c
		Elkriver dow	instream Bacti	- 15	2017- 12 - 27	15:00	Water	X										1		-	te		t, t	/ c
													_					1	_					··· -
THE			• RI		SPECIFY DATE:	,	(surcharge may apply)		<u> </u>	RELI	NQUIS	SHED	BY:		DA	TE:	2017	/-12-2	27 F	RECEI	VED BY	: DATI	28.	100.11
								HŲN	GRY	BAYI	<b>FALU</b>	KE	T	ME:		5:00	pm	Ŵ	MA	ТІМІ	: 17	301		
SENC	NVOICE TO	):		4 IFT			$\prec$ $\vdash$			RELI	NQUIS	HED	BY:		DA	TE:			F	RECER	VED BY		= =	<u> </u>
INVO	ICE FORMAT	:				•				ТІМЕ:														
SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO								FOR LAB USE ONLY					~	1										
			maalematel@an	area no. oo n						Coole	er Seal	I Intac	t?		Sampi c	e Tem	peratu	ıre:]	<b>↓_</b> °C	;  c	Jooling I	Method?		
										Ť	es	_NO	<u></u> N	/A	Frozer	7 <u> </u>	Yes	NC	<u>ر</u>		_iceps	icksir	.е	None

G'/QUALITY/00\_DOCUMENTS/10\_AUTHORIZED/FORMS/Hungry's CoC for ALS full EMS.xis ->



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 05-JAN-18 Report Date: 13-JAN-18 11:59 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2041935 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - WINTER 2017 EMS WEEK 4 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
1 2041935-1 W/W/TP INFLUENT							
Sampled Bv: HB on 04-JAN-18 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	237	DLHC	75	mg/L		05-JAN-18	R3932671
Total Suspended Solids	306	DLHC	9.0	mg/L		06-JAN-18	R3929766
рН	7.53		0.10	pН		09-JAN-18	R3932366
L2041935-2 WWTP EFFLUENT							
Sampled By: HB on 04-JAN-18 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.052		0.050	mg/L		08-JAN-18	R3930387
Biochemical Oxygen Demand	4.7		2.0	mg/L		05-JAN-18	R3932671
Chemical Oxygen Demand	35		10	mg/L		11-JAN-18	K3933275
Ortnopnosphate-Dissolved (as P)	0.362		0.010	mg/L		07-JAN-18	K3929811
Colliorm Bacteria - Fecal Phoephorup (D) Total	008	DLA	100	CFU/100mL	10 101 40	05-JAN-18	R3930029
Thospholus (P)-10tal	0.626		0.020	mg/L	12-JAN-18	12-JAN-18	K3933945
l otal Suspended Solids	4.0		3.0	mg/L		06-JAN-18	R3929766
P⊓ NO2_NO3 and Sum of NO2/NO3	7.52		0.10	рп		09-JAN-18	R3932366
Nitrate in Water by IC							
Nitrate (as N)	40.6	HTD	0.10	mg/L		09-JAN-18	R3932016
Nitrate+Nitrite				_			
Nitrate and Nitrite (as N)	40.7		0.10	mg/L		10-JAN-18	
Nitrite in Water by IC							<b>D</b>
Nitrite (as N)	0.034		0.010	mg/L		05-JAN-18	R3932016

#### Sample Parameter Qualifier Key:

Qualifier	Description											
DLA	Detection Limit adjusted for required dilution											
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).											
HTD	Hold time exceeded	for re-analysis or dilution, but initial testing wa	as conducted within hold time.									
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.											
Test Method R	eferences:											
ALS Test Code	Matrix	Test Description	Method Reference**									
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode									

This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

COD-T-COL-CL Water Chemical Oxygen Demand (COD)

The Chemical Oxygen Demand (COD) test is used to estimate the amount of organic matter in the water. The sample is added to COD tubes, which contain a premixed volume of reagents. The sample is then heated for two hours on the COD reactor with a strong oxidizing agent, potassium dichromate. The COD reagents also contain silver and mercury ions. Silver is used as a catalyst and mercury is used to complex chloride interference. Oxidizable organic compounds react, reducing the dichromate ion to green chromic ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is measured colormetrically and a decrease in absorbance at 420 nm is proportional to the COD. Samples with concentrations > 150 mg/L can be diluted into the linear range.

APHA 5220 D Colorimetry

APHA 2540 D-Gravimetric

FCC-MF-CL APHA 9222D Fecal Coliform Count-MF Water This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level.

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION						
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC						
This analysis is carried out, of Chemistry, "Flow-injectio al.	on sulfuric a n analysis wi	cid preserved samples, using procedures modified th fluorescence detection for the determination o	ed from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society f trace levels of ammonium in seawater", Roslyn J. Waston et						
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)						
norganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.									
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)						
Inorganic anions are analyz	ed by Ion Ch	romatography with conductivity and/or UV detect	tion.						
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS						
This analysis is carried out persulphate digestion of the	using proced e sample.	ures adapted from APHA Method 4500-P "Phosp	ohorus". Total Phosphorus is determined colourimetrically after						
PH-CL	Water	рН	APHA 4500 H-Electrode						
pH is determined in the lab	oratory using	a pH electrode. All samples analyzed by this me	thod for pH will have exceeded the 15 minute recommended						

hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed) PO4-DO-COL-ED Water Diss. Orthophosphate in Water by Colour **APHA 4500-P PHOSPHORUS** 

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

TSS-CL Water **Total Suspended Solids** 

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA

#### **Test Method References:**

ALS Test Code	Matrix	Test Description	Method Reference**
CL	ALS I	ENVIRONMENTAL -	CALGARY, ALBERTA, CANADA
Chain of Custody Numbers	s:		

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there. mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



		Workorder:	L204193	5	Report Date: 13	3-JAN-18	Pa	ge 1 of 4
Client:	FERNIE ALPINE RESOF 1505 - 17TH AVENUE S CALGARY AB T2T 0E2 PATRICK MA IEP	RT UTILITIES COI SW	RPORATIO	N				
	Matrix	Peference	Posult	Qualifier	Unite	PPD	Limit	Analyzed
	Watrix	Reference	Result	Quaimer	Units	KFD	Linit	Analyzeu
BOD-BC-CL	Water							
Batch WG2696522-2 Biochemical	R3932671 2 LCS Oxygen Demand		90.4		%		85-115	05-JAN-18
WG2696522- Biochemical	I MB Oxygen Demand		<2.0		mg/L		2	05-JAN-18
COD-T-COL-CL	Water							
Batch	R3933275							
WG2697268-3 Chemical Ox	B DUP	L2041935-2	38		ma/l	73	20	11 IANI 19
WG2697268-2	2 LCS	00	00		mg/E	7.5	20	TI-JAN-10
Chemical Ox	ygen Demand		99.4		%		85-115	11-JAN-18
WG2697268- Chemical Ox	I MB ygen Demand		<10		mg/L		10	11-JAN-18
WG2697268-4 Chemical Ox	4 MS ygen Demand	L2041935-2	97.2		%		70-130	11-JAN-18
FCC-MF-CL	Water							
Batch	R3930029							
WG2695072- <sup>2</sup> Coliform Bac	I MB teria - Fecal		<1		CFU/100mL		1	05-JAN-18
NH3-F-CL	Water							
Batch	R3930387							
Ammonia, To	otal (as N)		100.2		%		85-115	08-JAN-18
WG2695355-	5 MB							
Ammonia, To	otal (as N)		<0.050		mg/L		0.05	08-JAN-18
NO2-IC-N-CL	Water							
Batch	R3932016							
Nitrite (as N)	2 200		100.0		%		90-110	05-JAN-18
<b>WG2695774-</b> Nitrite (as N)	I MB		<0.010		mg/L		0.01	05-JAN-18
NO3-IC-N-CL	Water							
Batch	R3932016							
WG2695774-2 Nitrate (as N)	2 LCS		99.3		%		90-110	05-JAN-18
WG2695774- Nitrate (as N)	I MR		<0.020		mg/L		0.02	05-JAN-18



		Workorder:	L204193	5	Report Date: 13-	JAN-18	Pa	ge 2 of 4
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-ED	Water							
Batch R3933945								
WG2697655-7 DUP		L2041935-2						
Phosphorus (P)-Total		0.626	0.615		mg/L	1.7	20	12-JAN-18
WG2697655-10 LCS		KONELAB_TP						
Phosphorus (P)-Total			91.1		%		80-120	12-JAN-18
WG2697655-12 LCS		KONELAB_TP						
Phosphorus (P)-Total			96.8		%		80-120	12-JAN-18
WG2697655-2 LCS		KONELAB_TP						
Phosphorus (P)-Total			94.5		%		80-120	12-JAN-18
WG2697655-1 MB								
Phosphorus (P)-Total			<0.020		mg/L		0.02	12-JAN-18
WG2697655-11 MB								
Phosphorus (P)-Total			<0.020		mg/L		0.02	12-JAN-18
WG2697655-9 MB								
Phosphorus (P)-Total			<0.020		mg/L		0.02	12-JAN-18
WG2697655-8 MS		1 20/1035-2			-			
Phosphorus (P)-Total		L2041933-2	N/A	MS-B	%		-	12-JAN-18
PH-CL	Water							
Batch R3932366								
WG2696239-5 LCS								
рН			7.02		рН		6.9-7.1	09-JAN-18
PO4-DO-COL-ED	Water							
Batch R3929811								
WG2694961-3 DUP		L2041935-2						
Orthophosphate-Dissolved	d (as P)	0.362	0.362		mg/L	0.1	20	07-JAN-18
WG2694961-2 LCS								
Orthophosphate-Dissolved	d (as P)		109.4		%		70-130	07-JAN-18
WG2694961-1 MB								
Orthophosphate-Dissolved	d (as P)		<0.010		mg/L		0.01	07-JAN-18
WG2694961-4 MS		1 2041935-2						
Orthophosphate-Dissolved	d (as P)	L2041333-2	N/A	MS-B	%		-	07-JAN-18
	Watar							
	Talei							
Batch R3929766								
WG2694/89-5 LCS			106.2		0/_		05 445	06 1411 49
			100.2		/0		00-115	00-JAN-18
WG2694789-4 MB			-2.0		ma/l		2	00 1411 40
i olai Suspenueu Sullus			<j.u< td=""><td></td><td>mg/L</td><td></td><td>3</td><td>06-JAN-18</td></j.u<>		mg/L		3	06-JAN-18

Workorder: L2041935

Report Date: 13-JAN-18

#### Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

#### Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Workorder: L2041935

Report Date: 13-JAN-18

Hold Time Exceedances:

	Sample						
ALS Product Description	ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
рН							
	1	04-JAN-18 14:00	09-JAN-18 14:00	0.25	120	hours	EHTR-FM
	2	04-JAN-18 14:15	09-JAN-18 14:00	0.25	120	hours	EHTR-FM
Anions and Nutrients							
Nitrate in Water by IC							
	2	04-JAN-18 14:15	09-JAN-18 10:42	3	5	days	EHT
Legend & Qualifier Definition	is:						

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

Notes\*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2041935 were received on 05-JAN-18 12:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Vancouver BC, 1958 Triumph Street, V5L 1K5, Tel: 604-253-4168 Toll Free: 1-800-665-0243 Fax: 604-253-6700

ALS Environmental

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261 <sup>---</sup> Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 To Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-985 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Ti



L2041935-COFC

OF

#### CHAIN OF CUSTODY FOR

SEN	REP	ORT TO	D:						T				COT	E D.				•			-	, <u> </u>
COM	PANY	:	FERNIE AL	PINE RESORT	UTILITIES CORP		ATTN:	PATRICK MAJER			SIS F		1521									
ADDI	RESS		1505 - 17T⊢	Avenue South	East				_	1												
CITY	:		CALGARY		PROV: ALBE	RTA	POSTAL CODE:	T2T 0E2	-	Y						Ì						Amost
TEL:			1 - 800 - 25	8 - 7669	FAX: 403 -	244 - 3774	SAMPLER:	Hungry Baytaluke	- /	1												
PRO	JECT	NAME A	AND NO.:	FARUC-V	Vinter 2017 EMS v	veek 4	QUOTE NO:		-↓/								- /		ł	1		H' And
PON	0.				ALS CONTAC	r: Lydmyla Shvets	@ALSGlobal.co	m	_\`								I	1/	r -			
						-N/L	p najet@skire	r.com	₽		1							Y				- AC
REP	ORT F	ORMAT	Т:						ifom		1.1				İ	$\mathbf{N}$	V	$\int$				{ U
			1						-13	$ \mathcal{N} $	V	6	6	z	z	z	S	Ň.				NOTES (sample specific
	WO	Ħ	5	SAMPLE IDENTIF	FICATION	DATE / TIME	TIME	MATRIX	eca	SS	E	Ę	Total	NH3	<u>Š</u>	õ		5				comments, due dates, etc.)
	-				/	2018 - 1 - 4	14.00	Water	- -	X	X		<u> </u>								Γ	temp = / / C
ļ		+-{	WWTP Intil			2018 1 4	14:00	Water	1-	+	+	1				-1	x			1		temp = / C
			WWTP (nfl)	Jent BOD	$\rho$	2018-1-4						1										
			<b> </b>			2048 1 4	14-15	Water		$\frac{1}{x}$	+ x					-+	-	x			_	temp = / / C
		/		uent Routine	<u> </u>	2018-1-4	14:15	Water	-	+	-	+				1	X					temp = /// C
1		+	WWTP Eff	uent BOD		2018-1-4	14:15	Water		+	-	x	x	x	x	x				-	1-	temp = / C
	Ľ	$\square$	WWTP Eff	uent Nutrient	ځر	2018-1-4	14,15	Water	+		+		-							1	+-	temp = C
	Ľ	_1	WWTP Eff	uent Bacti			14.13	vvac.	- <u> </u> ^	+											-	
<u>ل</u> ک			1		<u> </u>			10/ptpr		+	×	+	+				$\frown$	)  -		+		temp = / C
ð			Elkriver Up	stram Routine		2018 - 1 - 4	14:30	Vvalei	_		+^	+	x	x	×	X		/-{		+		temp =
l S			Elkriver Up	stream Nutrien	t	2018 - 1 - 4	14:30					+	+^	<u>├</u> ^			Ť			+	-	temp = NUG/ C
AB		_	Ełkriver Up	stream Bacti		2018 - 1 - 4	14:30	vvater	-l-^			+	+				$\mathcal{A}$		-+-	-	+	
لې س										- <del> </del>	<del>-   _</del>			┼─			НЦ	7			┼╼	temp = C
15			Elkriver Ou	If all Routine	10	2018 - 1 - 4	14:45	Water		+^	+^	+	╞	╞╤	┼┯	-		$\leftarrow$			┼╾	temp = 10/R c
			Elkriver C	Jutfall Nutrien	t //	2018 - 1 - 4	14:45	Water	<u> </u>		+	<u>^</u>	+^	<u> </u>	<u> </u>	Ê	+		at		+	temp = C
			Elkriver Ou	utfall Bacti	12	2018 - 1 - 4	14:45	Water	×	(   	_			┥	-		┝╍╉╶	₩	(  -		<u>_</u>	
		-				-				_							$\left  \right $	-		1	∦─	temp = (   1 / C
			Elkriver do	wnstream Roul	tine	5 2018 - 1 - 4	15:00	Water		-   ×	.   X	_		<u> </u>	+				<del>, U</del>	-44	<u>^</u>  -,	
	-		Elkriver do	wnstream Nutr	ient /4	2018-1-4	15:00	Water				<u> </u>	×	L×	<u> </u>	<u> </u>	$ \downarrow $		·	+>	- 17	
1			Elkriver do	winstream Bac	i 74	2018 - 1 - 4	15:00	Water	'	<	_		-	_			K	-X	$\mathbf{x}_{+}$	-\$5	₩2	
1		_						<u> </u>			_					1		(	<u> </u>	<del></del>	<u>\</u>	
	<u> </u>				7 • ►	SPECIFY DAT	E:	(surcharge may apply)			RE	LINOL	JISHE	D BY:			DATE:	2018	- 1	4 RE		DBY: DATE: 03/01
ΠU	RN AF	ROUND	REQUIRED:					· · · · · ·		,	Н	JNGR	Y BA		UKE		TIME:		5.00			DAY DATE LAN
SE	ND IN	VOICE	TO:					ĸF			RE	LINQ	JISHE	D BY:			DATE:				CEIVE	UBT: UATE: Carlos
tN	/OICE	FORM	AT:	<b>─</b> □ <b>┣</b> ━┥			<u> </u>				_			<u> </u>			TIME:			ᅮ		
SP	ECIAL		UCTIONS	PLEASE FA	X A COPY OF TH	IE RESULTS TO 2	250-423-4652 OI	R E-MAIL TO						SE (	JNL Y	Sam	ple Te	mperat	ure: _(	$\partial_{\rm c}$	Co	oling Method?
l				wastewaten	wskisemie.com							Yes		aur 0	N/A	Froz	en?	Yes	<u> </u>	,	1	cepackslceNone
													_		_							



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 12-JAN-18 Report Date: 19-JAN-18 13:26 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2044250 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - WINTER 2017 EMS WEEK 5 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
1 2044250-1 WWTP INFLUENT							
Sampled By: HB on 10-JAN-18 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	114	DLHC	20	mg/L		12-JAN-18	R3938519
Total Suspended Solids	136	DLHC	9.0	mg/L		15-JAN-18	R3937550
рН	7.69		0.10	рН		17-JAN-18	R3939206
L2044250-2 WWTP EFFLUENT							
Sampled By: HB on 10-JAN-18 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		12-JAN-18	R3933921
Biochemical Oxygen Demand	<2.0		2.0	mg/L		12-JAN-18	R3938519
Chemical Oxygen Demand	16		10	mg/L		16-JAN-18	K3938193
Onnophosphate-Dissolved (as P)	0.220		0.010	mg/L		13-JAN-18	K3934213
Comorm Bacteria - Fecal Phosphorus (P) Total	11		1	CFU/100mL	10 10 10	12-JAN-18	K3934647
Thospholus (P)-10tal	0.279		0.020	mg/L	18-JAN-18	18-JAN-18	K3939283
nutai Suspenueu Sulius	<3.U 7.07		3.0	nig/L ∽⊔		13-JAN-18	R393/550
P⊓ NO2_NO3 and Sum of NO2/NO3	7.97		0.10	рп		17-JAN-TO	K3939200
Nitrate in Water by IC							
Nitrate (as N)	36.6	DLHC	0.10	mg/L		12-JAN-18	R3935319
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	36.6		0.11	mg/L		15-JAN-18	
Nitrite in Water by IC		DUUG					
	<0.050	DLHC	0.050	mg/L		12-JAN-18	R3935319

Qualifiers for In	ndividual Samples	Listed:	
Sample Numbe	Client ID	Qualifier	Description
L2044250-2	WWTP EFFLUENT	EHR	FCC - Exceeded Recommended Holding Time prior to receipt at the lab.
Sample Parame	eter Qualifier Key:		
Qualifier	Description		
DLHC	Detection Limit Raise	d: Dilution required due	e to high concentration of test analyte(s).
Test Method Re	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen	Demand (BOD) APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand dissolved oxyger BOD (CBOD) is o	carried out using proce (BOD) are determined n meter. Dissolved BO determined by adding	dures adapted from AP by diluting and incubat D (SOLUBLE) is detern a nitrification inhibitor to	PHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical ing a sample for a specified time period, and measuring the oxygen depletion using a nined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous to the diluted sample prior to incubation.
COD-T-COL-CL	Water	Chemical Oxygen De	emand (COD) APHA 5220 D Colorimetry
The Chemical O: contain a premix dichromate. The Oxidizable organ measured colorn into the linear ran	xygen Demand (COD) ed volume of reagents COD reagents also co ic compounds react, re netrically and a decrea nge.	test is used to estimate . The sample is then he ntain silver and mercur educing the dichromate se in absorbance at 42	e the amount of organic matter in the water. The sample is added to COD tubes, which eated for two hours on the COD reactor with a strong oxidizing agent, potassium y ions. Silver is used as a catalyst and mercury is used to complex chloride interference. to no green chromic ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is 0 nm is proportional to the COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Water	Fecal Coliform Count	t-MF APHA 9222D
This analysis is o Coliform bacteria involves an initia bacteria (Fecal) a	carried out using proce a is enumerated by cult I 24 hour incubation at and is used for non-tur	dures adapted from AP turing and colony count 44.5 degrees C of the bid water with a low bac	PHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". ing. A known sample volume is filtered through a 0.45 micron membrane filter. The test filter with the appropriate growth medium. This method is specific for thermotolerant ckground bacteria level.
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluores	cence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is o of Chemistry, "Fl al.	carried out, on sulfuric ow-injection analysis v	acid preserved samples vith fluorescence detect	s, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society tion for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with co	nductivity and/or UV detection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	C EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with co	nductivity and/or UV detection.
P-T-COL-ED	Water	Total P in Water by C	Colour APHA 4500-P PHOSPHORUS
This analysis is o persulphate dige	carried out using proce stion of the sample.	dures adapted from AP	PHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determined hold time from tir	l in the laboratory using me of sampling (field a	g a pH electrode. All sa nalysis is recommende	mples analyzed by this method for pH will have exceeded the 15 minute recommended d for pH where highly accurate results are needed)
PO4-DO-COL-EI	D Water	Diss. Orthophosphate	e in Water by Colour APHA 4500-P PHOSPHORUS
This analysis is c colourimetrically	carried out using proce on a sample that has I	dures adapted from AP been lab or field filtered	PHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined through a 0.45 micron membrane filter.
TSS-CL	Water	Total Suspended Sol	ids APHA 2540 D-Gravimetric
This analysis is o (TSS) are detern	carried out using proce nined by filtering a sam	dures adapted from AP aple through a glass fibr	PHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids re filter, and by drying the filter at 104 deg. C.
** ALS test metho	ds may incorporate mo	odifications from specifi	ed reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code Laboratory Location

#### **Test Method References:**

ALS Test Code	Matrix	<b>Test Description</b>	Method Reference**
ED	ALS E	ENVIRONMENTAL -	EDMONTON, ALBERTA, CANADA
CL	ALS E	ENVIRONMENTAL -	CALGARY, ALBERTA, CANADA

**Chain of Custody Numbers:** 

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there. mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.
### 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: 21 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800 Fort McMurray AB, Bay 1, 245 Mecdonald Cr, T9H 4B5, Tel: 760-791-1524 Fax: 78 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-6 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370. Toll Free: 1-800



### CHAIN OF CUSTODY FORM

SEN	O REPORT T	0:				CHAIN OF	CUS	<u>sto</u>	DY	FO	RM									PAGE	1	)F	_
сом		FERNIE ALPINE RESORT	UTILITIES CO	DRPORATION	ATTN:	PATRICK MAJER	AN	ALY	SIŞ F	REQI	JEST	ED:								,			
ADD	RESS	1505 - 17TH Avenue South	East																	7	7.	1	1
СІТУ	(:	CALGARY	PROV: A	LBERTA	POSTAL CODE:	T2T 0E2														1L	102	Я	
TEL.		1 - 800 - 258 - 7669	FAX: 40	03 - 244 - 3774	SAMPLER:	Hungry Baytaluke	-		1						I			.		11m	<i>"\</i> "	1	
PRO	JECT NAME	AND NO.: FARUC-W	Vinter 2017 EN	MS week 5	OUOTE NO:															1/	1	2	
PO	ND.:		ALS CONT	TACT: Lydmyla Shvets	@ALSGlobal.cor	រ រា														10	M	$\mathcal{N}$	
					p najer@skirc	r.com														17-	11	ΥΨ	
REP	ORT FORMAT						, w													1	V		
	WO#	┓─────┤ └┘ <b>┎</b> ───					18			4	٩	7	7	z						•	•		-
		SAMPLE IDENTIF	ICATION			MATRIX	ecal	SS	L I	tho tho	otal	H3-P	l ⊡	<u></u>	SO .	8				NOT comm	ES (samp ients, due c	e specific ates, etc.)	
	7	WAVTP Influent Routine	·	1 2018 - 1 - 10	14:00	Water	<u> </u>		a X	0	Т	z	<u>z</u>		<u> </u>	<u> </u>	_	+	$\left  \right $		1	On	,
		WWTP influent BOD		<b>1</b> 2018 - 1 - 10	14.00	Water	-}	<u>^</u>	$\vdash$	<u> </u>							+	+		temp =	-(7-	-/	-
							+	1									+	╉╾┦	┝╌╌╉		_0	, ,	-
		WWTP Effluent Routine		2 2018 - 1 - 10	14.15	Water	+	×	x						$\rightarrow$	×		╂──┦	┟──╊	temo =			-
	/	WWTP Effluent BOD		$\frac{1}{4}$ 2018 - 1 - 10	14:15	Water									x	<u> </u>	+	╉╾┦	<b>├</b> ─- <b>├</b>	temp =	17-	$1 - \frac{1}{2}$	-
	0-1	WWTP Effluent Nutrient	~	2018 - 1 - 10	14:15	Water				x	x	x	x	x	<u> </u>		-	╉╾┦	<u>                                      </u>	temo =	15	$\vdash$	-
	$\leftarrow$	WWTP Effluent Bacti		228-1-10	14:15	Water	1 x										-	╉╼┦		temo =	/~	<u> </u>	-
≻			6	2010 1 10			1										+-	╉╍╌┥			-A-		-
N		Elkriver Upstram Routine		2018 - 1 - 10	14:30	Water	+	x	x								-	+	<u>├</u> <u> </u> ;	temp =	<del>1</del> 人	n r	-
SE (		Elkriver Upstream Nutrient		2018 - 1 - 10	14:30	Water				х	x	x	x	x			+	╉┯┦		temo =	KIU		-
9 0		Elkriver Upstream Bacti	(	2018 - 1 - 10	14:30	Water	1 x										+	+		temp =	+	<u> </u>	-
S LA												_						++		1	$\checkmark$		-
P.		Elkriver Outfall Routine		2018 - 1 - 10	14:45	Water		x	x									<u></u> †	ļ ,	temp =	KA	nta	-
		Elkriver Outfall Nutrient	NU	2018 - 1 - 10	14:45	Water	-		-	- X	x	x	х	x				+-+	ļ ,	temp =	₩₽	mq	1
	-	Elkriver Outfall Bacti	D. A	2018 - 1 - 10	14:45	Water	×								-		+	++	ļ ,	temp =	₩.		-
			SHMP1												+		1	+	i			n	-
		Elkriver downstream Routin		2018 - 1 - 10	15:00	Water	1-	x	x									┨──┤	╞╌━┠	temp =	$\ \lambda\ $	IN a	1
	·	Elkriver downstream Nutrie	nt 1777	2018 - 1 - 10	15:00	Water				x	x	x	x	X			+	+	⊨ †,		₩¥		1
		Elkriver downstream Bacti		2018 - 1 - 10	15:00	Water	x										+	+	<mark>ا ا</mark>	iemp =			-
														$\vdash$			-	+	╞═╋			, ,	ᅱ
H	L		6 L			(surcharge may apply)		L	RELI		SHED	BY:			ATE: 2	2018 -	1 – 10	RECI	EIVED I	BT: I	DATE.	the	7
TUR	N AROUND R	EQUIRED:	• * •			······································			HUN	GRY	BAY	TALU	KE	Т	ME:	5:	:00 pm	1	7	14	TIME:		1
SEN		D: 🛛 🖂 📉				$\prec$ $\vdash$			RELI		SHED	BY.		D/	ATE:			RECE	EIVED /	BY. (	DATE:	7:3	7
INVO	DICE FORMAT		Τ'ם						<u> </u>	_				 T	ME						TIME:	/	1
SPE	CIAL INSTRU	CTIONS PLEASE FAX	A COPY OF T	THE RESULTS TO 250	-423-4652 OR E	-MAIL TO			FOF		3 USI	Ê ON	ίLΥ				Ŕ	<u> </u>					1
		wastewater@s	skifernie.com						000k	1 Sea	Intac	1?	_	Samp	e Tem	peratule	ø	°C	Coolin	Metho	d7		1
									<u> γ</u>	es _	_No	N	NA .	Froze	1?	Yes 📕	_No		Kce	packs	lce _	_None	



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 18-JAN-18 Report Date: 25-JAN-18 16:58 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2046540 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - WINTER 2017 EMS WEEK 6 HB C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 17-JAN-18 @ 14:00							
Matrix:							
Miscellaneous Parameters							
Biochemical Oxygen Demand	234	DLHC	75	mg/L		19-JAN-18	R3944725
Total Suspended Solids	254	DLHC	13	mg/L		23-JAN-18	R3944462
РН	7.88		0.10	Hq		25-JAN-18	R3945124
12046540-2 WWTP EFELUENT							
Sampled By: HB on 17-JAN-18 @ 14:15							
Matrix:							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		21-JAN-18	R3941107
Biochemical Oxygen Demand	<2.0		2.0	mg/L		19-JAN-18	R3944725
Chemical Oxygen Demand	<10		10	mg/L		21-JAN-18	R3940320
Orthophosphate-Dissolved (as P)	0.079		0.010	mg/L		19-JAN-18	R3939885
Coliform Bacteria - Fecal	2		1	CFU/100mL		18-JAN-18	R3939789
Nitrate (as N)	35.1	DLHC	0.10	mg/L		18-JAN-18	R3939685
Nitrite (as N)	<0.050	DLHC	0.050	mg/L		18-JAN-18	R3939685
Phosphorus (P)-Total	0.099		0.020	mg/L	23-JAN-18	24-JAN-18	R3944448
Total Suspended Solids	<3.0	DLHC	3.0	mg/L		23-JAN-18	R3944462
рН	7.97		0.10	рН		25-JAN-18	R3945124
NO2, NO3 and Sum of NO2/NO3							
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	35.1		0.11	mg/L		19-JAN-18	
L2046540-3 ELKRIVER UPSTREAM							
Sampled By: HB on 17-JAN-18 @ 14:30							
Matrix:							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		21-JAN-18	R3941107
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		19-JAN-18	R3939885
Coliform Bacteria - Fecal	<1		1	CFU/100mL		18-JAN-18	R3939789
Nitrate (as N)	2.01		0.020	mg/L		18-JAN-18	R3939685
Nitrite (as N)	<0.010		0.010	mg/L		18-JAN-18	R3939685
Phosphorus (P)- I otal	<0.020	DUUG	0.020	mg/L	23-JAN-18	24-JAN-18	R3944448
l otal Suspended Solids	3.3	DLHC	3.0	mg/L		23-JAN-18	R3944462
	8.32		0.10	рн		25-JAN-18	R3945124
Noz, NOS and Sull of NO2/NOS							
Nitrate and Nitrite (as N)	2.01		0.050	mg/L		19-JAN-18	
L2046540-4 ELKRIVER OUTFALL							
Sampled By: HB on 17-JAN-18 @ 14:45							
Matrix:							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		21-JAN-18	R3941107
Orthophosphate-Dissolved (as P)	0.012		0.010	mg/L		19-JAN-18	R3939885
Coliform Bacteria - Fecal	2		1	CFU/100mL		18-JAN-18	R3939789
Nitrate (as N)	0.315		0.020	mg/L		18-JAN-18	R3939685
Nitrite (as N)	<0.010		0.010	mg/L		18-JAN-18	R3939685
Phosphorus (P)-Total	<0.020		0.020	mg/L	23-JAN-18	24-JAN-18	R3944448
Total Suspended Solids	3.3	DLHC	3.0	mg/L		23-JAN-18	R3944462
рН	8.25		0.10	pН		25-JAN-18	R3945124
NO2, NO3 and Sum of NO2/NO3							

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 17-JAN-18 @ 14:45							
Matrix:							
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.315		0.050	mg/L		19-JAN-18	
L2046540-5 ELKRIVER DOWNSTREAM							
Sampled By: HB on 17-JAN-18 @ 15:00							
Matrix:							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		21-JAN-18	R3941107
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		19-JAN-18	R3939885
Coliform Bacteria - Fecal	1		1	CFU/100mL		18-JAN-18	R3939789
Nitrate (as N)	10.1	DLHC	0.10	mg/L		18-JAN-18	R3939685
INITITE (AS N)	<0.050	DLHC	0.050	mg/L	00 100140	18-JAN-18	K3939685
Priosphorus (P)-Total Total Suspended Salida	<0.020		0.020	mg/L	23-JAN-18	24-JAN-18	K3944448
	4.0	DLILC	3.0	ing/∟		23-JAN-18	K3944462
NO2 NO3 and Sum of NO2/NO3	8.20		0.10	рп		20-JAIN-10	rt3945124
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	10.1		0.11	mg/L		19-JAN-18	

### Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Raised	I: Dilution required due to high concentration of t	est analyte(s).
Test Method Re	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is c oxygen demand ( dissolved oxygen BOD (CBOD) is c	arried out using proced BOD) are determined I meter. Dissolved BOD letermined by adding a	lures adapted from APHA Method 5210B - "Bioc by diluting and incubating a sample for a specific (SOLUBLE) is determined by filtering the samp nitrification inhibitor to the diluted sample prior t	hemical Oxygen Demand (BOD)". All forms of biochemical d time period, and measuring the oxygen depletion using a le through a glass fibre filter prior to dilution. Carbonaceous o incubation.
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
The Chemical Ox contain a premixe dichromate. The Oxidizable organi measured colorm into the linear ran	eygen Demand (COD) t ad volume of reagents. COD reagents also cor c compounds react, re etrically and a decreas ge.	est is used to estimate the amount of organic mathematics. The sample is then heated for two hours on the nation silver and mercury ions. Silver is used as a ducing the dichromate ion to green chromic ion. e in absorbance at 420 nm is proportional to the	atter in the water. The sample is added to COD tubes, which COD reactor with a strong oxidizing agent, potassium catalyst and mercury is used to complex chloride interference. For samples in the 10 - 150 mg/L range the remaining Cr6+ is COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is c Coliform bacteria involves an initial bacteria (Fecal) a	arried out using procect is enumerated by cultured by cultured by cultured by cultured by cultured by a set of the set of	lures adapted from APHA Method 9222 "Membra uring and colony counting. A known sample volu 14.5 degrees C of the filter with the appropriate of id water with a low background bacteria level.	ane Filter Technique for Members of the Coliform Group". ne is filtered through a 0.45 micron membrane filter. The test prowth medium. This method is specific for thermotolerant
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is c of Chemistry, "Flo al.	arried out, on sulfuric a ow-injection analysis wi	cid preserved samples, using procedures modified the fluorescence detection for the determination of the determina	ed from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion Ch	romatography with conductivity and/or UV detection	tion.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion Ch	romatography with conductivity and/or UV detection	tion.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c persulphate diges	arried out using proced stion of the sample.	lures adapted from APHA Method 4500-P "Phos	phorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determined hold time from tin	in the laboratory using ne of sampling (field ar	a pH electrode. All samples analyzed by this me alysis is recommended for pH where highly acc	ethod for pH will have exceeded the 15 minute recommended arate results are needed)
PO4-DO-COL-ED	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c colourimetrically	arried out using procec on a sample that has b	lures adapted from APHA Method 4500-P "Phos een lab or field filtered through a 0.45 micron me	phorus". Dissolved Orthophosphate is determined embrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is c (TSS) are determ	arried out using procec ined by filtering a sam	lures adapted from APHA Method 2540 "Solids" ole through a glass fibre filter, and by drying the	Solids are determined gravimetrically. Total suspended solids iilter at 104 deg. C.
** ALS test method	ds may incorporate mo	difications from specified reference methods to i	nprove performance.
The last two lette	rs of the above test co	le(s) indicate the laboratory that performed anal	rtical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

### Test Method References:

ALS Test Code Matrix	Test Description	Method Reference**
----------------------	------------------	--------------------

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review. **ALS Environmental** 

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tet: 604-253-4188 Toll Free: 1-800-665-0243 F Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-558 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 I 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 Fr Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-( Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645



L2046540-COFC

SEND F	REPORT TO	D:					CHAIN OF	CUS	то	DY	FO	RM							<u> </u>		PAGE		Ur	
COMPA	ANY:	FERNIE AL	INE RESORT	UTILITIES CORPO	RATIÓN	ATTN:	PATRICK MAJER	AN	ALYS	SI\$ F	REQL	JEST	ED:							<u> </u>	/			<u>+</u>
ADDRE	SS:	1505 - 17TH	Avenue South	East															1		A	i.h.	07	F
CITY:		CALGARY		PROV: ALBER	TA	POSTAL CODE:	T2T 0E2														//	Ų,	~~~	<b>`</b>
TEL:		1 - 800 - 25	8 - 7669	FAX: 403 - 24	44 - 3774	SAMPLER:	Hungry Bayteluke										1				0~	$\mathcal{N}$		
PROJE		AND NO.:	FARUC-W	/inter 2017 EMS we	eek <b>65</b> HJS	QUOTE NO:																20		
PO NO.	<u>.</u>			ALS CONTACT:	Lydmyla Shvets	@ALSGlobal.com	m														-	$\mathcal{S}$		
REPOR	RTFORMAT	Т:		╏╱ □┣━	- I/// Ч	p <u>pajer@skirc</u>	r.com	t otiforms																
	WO#				DATE / TIME	COLLECTED	MATRIX		l o		P G	E E	3-N	N-50	02-N	50	g				NO	l'ES (sarr	ple spec	fic .
					YYYY-MM-DD	TIME		Ŭ, Ŭ,	,s⊢	표	δ	P	ž	Ň	ž	8	8			<u> </u>			f	
		WWTP Influ	ent Routine		2018 - 1 - 17	14:00	Water		Х	X	ļ										temp =	-//	4	
		WWTP Influ	ient BOD	2	2018 - 1 - 17	14:00	Water				<u> </u>					<u> </u>					temp =	10.	/	
										ļ									<u>                                     </u>					
		WWTP Efflu	uent Routine	2	2018 - 1 - 17	14:15	Water		X	×							×	_	┟───╋		temp =		-+-	
		WWTP Efflu	uent BOD	4	2018 – 1 – 17	14:15	Water			<u> </u>		ļ				X			┢╼╼╌┠╴		temp =	_47	$\frac{1}{2}$	<u> </u>
		WWTP Effl	uent Nutrient	5/	2018 - 1 - 17	14:15	Water	_		<u> </u>	X	X	×	X	х				┝━━┼		temp =	<u> h</u>	Υ	
		WWTP Effic	uent Bacti	6	2018-1-1-	14:15	Water	×	[										┝──╄	<u> </u>	temp =			
≿[								_				L							⊢∔	<u> </u>				~
8		Elkriver Ups	stram Routine	at	2018 - 1 - 17	14:30	Water		X	X	_	-							┢━━╂	<u> </u>	temp =			<u></u>
ISU I		Elkriver Ups	stream Nutrient	7	2018 - 1 - 17	14:30	Water				X	X	X	X	X				┟──╂	$\rightarrow$	temp =	$\dashv \downarrow$	4	<u> </u>
AB		Elkriver Ups	stream Bacti	<u> </u>	2018 - 1 - 17	14:30	Water	×		<u> </u>		ļ	<u> </u>						┢──┥		temp =	<u>Ų</u>		
цЧ							ļ		<u> </u>	<u> </u>				<u> </u>					┢╌┥					
12 [		Elkriver Out	tall Routine	10	2018 – 1 <b>– 1</b> 7	14:45	Water		X	X		<u> </u>		<u> </u>					$\square$		temp =	_1	A.	
		Elkriver O	utfall Nutrient	-11	2018 - 1 - 17	14:45	Water		ļ		x	×	×	X	X				$\square$		temp =		4	
		Elkriver Ou	tfall Bacti	12	2018 – t – 17	14:45	Water	×											$\vdash$		temp =	14	1	
~											<u> </u>		1.					-						
		Elkriver dov	vnstream Routir	1e 5,	2018 - 1 - 17	15:00	Water		X	×			L						╘	$\square$	temp =	_A	4	C
		Elkriver dov	vnstream Nutrie	ent 14	2018 - 1 - 17	15:00	Water				X	X	X	X	X				$\square$		temp =		-1	C
		Elkriver dov	vnstream Bacti	-15	2018 <b>-</b> 1 - 17	15;00	Water	X			1					<u> </u>					temp =	<u> </u>	<u> </u>	<u>с</u>
																						<del>_</del>		191
			<b>R</b>		SPECIFY DATE:	:	(surcharge may apply)			REL	.INQU	ISHED	DBY:		C	DATE:	201	8 – 1	<u>- 17 j</u>	RECEIN	ED BY	DATE:	1/	14
TURN	ANOUND									HU	NGR	( BAY	TALL	JKE		TIME:		5:0	0 pm	7	1/2	TIME:	4	4)
SEND	INVOICE T	0:		ДŀГ		┠╼╶┠╼╸	ĸr			REL	INQU	ISHE	) BY:		<u> </u>	ATE:				RECEN	ED BY:	DATE:		
INVOR	CE FORMA	T:		<u> </u>		ŀ									ŀ	TIME:			لمر		·	TIME:		
SPECI	AL INSTRU	CTIONS:	PLEASE FAX	A COPY OF THE P	RESULTS TO 25	0-423-4652 OR	E-MAIL TO			FO	RLA	BÜS	SE O	NLY	1				⇒		antine Ad-11			
			wastewater@	onii ettiile.cutti						Coo	ver Se Yes	al Inte No	tct?	N/A	Sam   Erozi	ple Té en?	mpera Yet	atur <u>e:</u> S	No		lcepacks	lce	N	one
										I					1.00		_							



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 29-JAN-18 Report Date: 05-FEB-18 16:19 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2050121 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - WINTER 2017 EMS WK #7 FOR #4 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled Bv: HB on 25-JAN-18 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	117	DLHC	75	mg/L		30-JAN-18	R3954718
Total Suspended Solids	176	DLHC	9.0	mg/L		31-JAN-18	R3950008
рН	8.11		0.10	рН		30-JAN-18	R3947606
L2050121-2 WWTP EFFLUENT							
Sampled By: HB on 25-JAN-18 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		01-FEB-18	R3950168
Biochemical Oxygen Demand	<2.0		2.0	mg/L		30-JAN-18	R3954718
Chemical Oxygen Demand	12		10	mg/L		01-FEB-18	R3951452
Orthophosphate-Dissolved (as P)	0.090		0.010	mg/L		30-JAN-18	R3947098
Coliform Bacteria - Fecal	7		1	CFU/100mL		29-JAN-18	R3947315
Phosphorus (P)- I otal	0.097		0.020	mg/L	04-FEB-18	05-FEB-18	R3954467
l otal Suspended Solids	<3.0		3.0	mg/L		31-JAN-18	R3950008
p⊓ NO2_NO3 and Sum of NO2/NO3	7.98		0.10	рн		30-JAN-18	R3947606
Noz, Nos and Sum of Noz/Nos							
Nitrate (as N)	36.2	DLHC	0.10	mg/L		29-JAN-18	R3947249
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	36.2		0.11	mg/L		30-JAN-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLHC	0.050	mg/L		29-JAN-18	R3947249
L2050121-3 ELKRIVER UPSTREAM							
Sampled By: HB on 25-JAN-18 @ 14:30							
Matrix: WATER							
Ammonia, Total (as N)	-0.050		0.050	ma/l		01 EEB 19	<b>B2050169</b>
Arithonia, Total (as N) Orthophosphoto Discolved (as P)	<0.050		0.050	mg/L		20 IAN 18	R3950100
Coliform Bacteria - Fecal	<0.010		0.010	CELI/100ml		20 JAN 19	R3947090
Phosphorus (P)-Total	< 1		0.020	ma/l	04-EEB-18	29-JAN-18	R3947315 R3054467
Total Suspended Solids	4.7		3.0	mg/L	041 EB 10	31-JAN-18	R3950008
pH	8.35		0.0	ng/E		30-JAN-18	R3947606
NO2, NO3 and Sum of NO2/NO3	0.00		5.10	P			
Nitrate in Water by IC							
Nitrate (as N)	1.95		0.020	mg/L		29-JAN-18	R3947249
Nitrate+Nitrite	4.05		0.050	mc/l		20 14 14 20	
Nitrate and Nitrite (as N)	1.95		0.050	mg/∟		29-JAN-18	
Nitrite in water by iC Nitrite (as N)	<0.010		0.010	ma/L		29-JAN-18	R3947249
L2050121-4 ELKRIVER OUTFALL				5			
Sampled By: HB on 25-JAN-18 @ 14:45							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		01-FEB-18	R3950168
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		30-JAN-18	R3947098
Coliform Bacteria - Fecal	1		1	CFU/100mL		29-JAN-18	R3947315
Phosphorus (P)-Total	<0.020		0.020	mg/L	04-FEB-18	05-FEB-18	R3954467
Total Suspended Solids	<3.0		3.0	mg/L		31-JAN-18	R3950008

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 25- IAN-18 @ 14:45							
Matrix: WATER							
pH	8.25		0.10	pН		30-JAN-18	R3947606
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	1.66		0.020	mg/L		29-JAN-18	R3947249
Nitrate+Nitrite Nitrate and Nitrite (as N)	1.66		0.050	ma/L		29-JAN-18	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/l		29-JAN-18	R3947249
	<0.010		0.010	iiig/E		20 0/11 10	10047240
Sampled By: HB on 25-JAN-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		01-FEB-18	R3950168
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		30-JAN-18	R3947098
Coliform Bacteria - Fecal	4		1	CFU/100mL		29-JAN-18	R3947315
Phosphorus (P)-Total	<0.020		0.020	mg/L	04-FEB-18	05-FEB-18	R3954467
Total Suspended Solids	4.7		3.0	mg/L		31-JAN-18	R3950008
	8.36		0.10	рН		30-JAN-18	R3947606
NO2, NO3 and Sum of NO2/NO3							
Nitrate (as N)	1.97		0.020	mg/L		29-JAN-18	R3947249
Nitrate+Nitrite							
Nitrate and Nitrite (as N) Nitrite in Water by IC	1.97		0.050	mg/L		29-JAN-18	
Nitrite (as N)	<0.010		0.010	mg/L		29-JAN-18	R3947249

### **Qualifiers for Sample Submission Listed:**

Qualifier	Description
EHR	Bacteriological, BOD, NO2/NO3, PO4 - Exceeded Recommended Holding Time prior to receipt at the lab.
EXTEMP10	13C - Samples Received with temperature >10 Degrees C

### Sample Parameter Qualifier Key:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is carried o oxygen demand (BOD) a dissolved oxygen meter. BOD (CBOD) is determin	ut using proc re determine Dissolved B0 ned by adding	edures adapted from APHA Method 5210B - "Bi d by diluting and incubating a sample for a spec DD (SOLUBLE) is determined by filtering the sar g a nitrification inhibitor to the diluted sample price	ochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a nple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
The Chemical Oxygen D contain a premixed volur dichromate. The COD re Oxidizable organic comp measured colormetrically into the linear range.	emand (COD ne of reagent agents also c ounds react, v and a decre	e) test is used to estimate the amount of organic is. The sample is then heated for two hours on the contain silver and mercury ions. Silver is used as reducing the dichromate ion to green chromic ic ase in absorbance at 420 nm is proportional to the	matter in the water. The sample is added to COD tubes, which he COD reactor with a strong oxidizing agent, potassium a catalyst and mercury is used to complex chloride interference. n. For samples in the 10 - 150 mg/L range the remaining Cr6+ is he COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is carried o Coliform bacteria is enun involves an initial 24 hou bacteria (Fecal) and is us	ut using proc nerated by cu r incubation a sed for non-tu	edures adapted from APHA Method 9222 "Mem Ilturing and colony counting. A known sample vo at 44.5 degrees C of the filter with the appropriat Irbid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". Jume is filtered through a 0.45 micron membrane filter. The test e growth medium. This method is specific for thermotolerant
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried o of Chemistry, "Flow-injec al.	ut, on sulfurio tion analysis	c acid preserved samples, using procedures mo with fluorescence detection for the determinatio	dified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society n of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are ana	lyzed by lon	Chromatography with conductivity and/or UV de	tection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are ana	lyzed by lon	Chromatography with conductivity and/or UV de	tection.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried o persulphate digestion of	ut using proc the sample.	edures adapted from APHA Method 4500-P "Ph	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determined in the la hold time from time of sa	aboratory usi mpling (field	ng a pH electrode. All samples analyzed by this analysis is recommended for pH where highly a	method for pH will have exceeded the 15 minute recommended ccurate results are needed)
PO4-DO-COL-ED	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried o colourimetrically on a sar	ut using proc nple that has	edures adapted from APHA Method 4500-P "Ph been lab or field filtered through a 0.45 micron	osphorus". Dissolved Orthophosphate is determined membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Laboratory Definition Code	e Labor	ratory Location	
ED	ALS E	NVIRONMENTAL -	EDMONTON, ALBERTA, CANADA
CL	ALS E	NVIRONMENTAL -	CALGARY, ALBERTA, CANADA

### Chain of Custody Numbers:

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

### ALS Environmental

ANALYTICAL CHEMISTRY & TESTING SERVICES



Vancouver BC, 1988 Triumph Street, VSL 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 F Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-555 Grand Prairie AB, 9595 - 111 Street, TBV 5W1, Tel: 780-539-5195 Toll Free: 1-800-668-9978 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586 Edmonton AB, 9936 - 67th Avenue, T6E 025, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fr Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-1 Saskatoon SK, B19 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toli Free: 1-800-667-7645



L2050121-COFC

#### SEND REPORT TO: CHAIN OF CUSTODY FORM PAGE OF FERNIE ALPINE RESORT UTILITIES CORPORATION COMPANY: ATTN: PATRICK MAJER ANALYSIS REQUESTED: ADDRESS: 1505 - 17TH Avenue South East CALGARY CITY: PROV: ALBERTA POSTAL CODE: T2T 0E2 1 - 800 - 258 - 7669 TEL: FAX: 403 - 244 - 3774 SAMPLER: Hungry Baytaluke F A R U C - Winter 2017 EMS wk # 7 for # 4 PROJECT NAME AND NO. QUOTE NO PO NO.: ALS CONTACT: Lydmyla Shvets@ALSGlobal.com $\mathbf{X}$ @skircr.com REPORT FORMAT: Coliforms WO# DATE / TIME COLLECTED ۵. ۵. NH3-N N-CON SAMPLE IDENTIFICATION NO2-N Fecal Ortho BODS MATRIX TSS Total NOTES (sample specific 00 YYYY-MM-DD TIME £ comments, due dates, etc.) WWTP Influent Routine 2018 - 1 - 25 14:00 Water х х temp = C WWTP Influent BOD 2018 - 1 - 25 14:00 Water х С temo = WWTP Effluent Routine 2018 - 1 - 2514:15 Water х Х х temp = С WWTP Effluent BOD $\overline{q}$ 2018 - 1 - 25 14:15 Water х temo = С WWTP Effluent Nutrient 2018 - 1 - 25 14:15 Water х х х х х temp = С WWTP Effluent Bacti 2018 - 1 - 25 0 14:15 Water Х temp = С ONLY Elkriver Upstram Routine 2018 - 1 - 2514:30 Water х X LAB USE temp = С Ś Elkriver Upstream Nutrient 2018 - 1 - 25 14:30 Water х х х х х temp = ÷ C Elkriver Upstream Bacti α 2018 - 1 - 2514:30 Water х temp = c FOR Elkriver Outfail Routine Ψ 2018 - 1 - 25 14:45 Water X ٠X temp = С Elkriver Outfall Nutrient 2018 - 1 - 25 14:45 Water х х х х х temp = С Elkriver Outfall Bacti 2018 - 1 - 25 14:45 Water. X ি না ব্ৰু temp = С 111日日本20 Elkriver downstream Routine 2018 🗮 1 🖣 25 15 00 2.51 Water X х 1 temp ⇒ С Elkriver downstream Nutrient 2018 1 25 15:00 Water х х х х х ç temp = Elkriver downstream Bacti 2018 - 1 - 25 15:00 Water х temp = С **d** SPECIFY DATE: TURN AROUND REQUIRED: (surcharge may apply) RELINQUISHED BY: 2018 - 1 - 25 RECEIVED BY: DATE: 29-JUNI DATE: HUNGRY BAYTALUKE 5:00 pm MM 9:41 TIME TIME: SEND INVOICE TO: X RELINQUISHED BY: DATE: RECEIVED BY: DATE: INVOICE FORMAT: П TIME. TIME: SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO FOR LAB USE ONLY wastewater@skifemie.com Cooler Seat Intact? Sample Temperature: , 10 °C Cooling Method? √Yes \_No N/A Frozen? \_No Licepacks \_\_\_\_ice Yes None



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:02-FEB-18Report Date:09-FEB-18 16:01 (MT)Version:FINAL

Client Phone: 403-254-7669

## Certificate of Analysis

Lab Work Order #: L2052150 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - WINTER 2017 EMS WK # 8 FOR # 5 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HUNGRY BAYTALLIKE on 01-FEB-18 @	14.00						
Matrix: WATER	14.00						
Miscellaneous Parameters							
Biochemical Oxygen Demand	103	DLHC	20	mg/L		02-FEB-18	R3956914
Total Suspended Solids	148	DLHC	5.0	mg/L		07-FEB-18	R3957426
рН	8.03		0.10	pH		02-FEB-18	R3954927
L2052150-2 WWTP EFFLUENT							
Sampled By: HUNGRY BAYTALUKE on 01-FEB-18 @	14:15						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		08-FEB-18	R3957532
Biochemical Oxygen Demand	<2.0	<2.0 2.0 mg/L 02-F	02-FEB-18	R3956914			
Chemical Oxygen Demand	12		10	mg/L		06-FEB-18	R3956616
Orthophosphate-Dissolved (as P)	0.196		0.010	mg/L		03-FEB-18	R3953309
Coliform Bacteria - Fecal	1		1	CFU/100mL		02-FEB-18	R3953271
Phosphorus (P)-Total	0.225		0.020	mg/L	08-FEB-18	09-FEB-18	R3958170
Total Suspended Solids	4.0		3.0	mg/L		07-FEB-18	R3957426
рН	8.06		0.10	рН		02-FEB-18	R3954927
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	00.0	DUUC	0.40				D0054500
Nitrate (as N)	29.2	DLHC	0.10	mg/∟		02-FEB-18	R3954569
Nitrate+Nitrite (as N)	29.2		0.11	ma/L		05-FEB-18	
Nitrite in Water by IC	20.2	0.11			00122.0		
Nitrite (as N)	<0.050 DLHC 0.050 mg/L					02-FEB-18	R3954569
L2052150-3 ELKRIVER UPSTREAM							
Sampled By: HUNGRY BAYTALUKE on 01-FEB-18 @	14:30						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		08-FEB-18	R3957532
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		03-FEB-18	R3953309
Coliform Bacteria - Fecal	1		1	CFU/100mL		02-FEB-18	R3953271
Phosphorus (P)-Total	<0.020		0.020	mg/L	08-FEB-18	09-FEB-18	R3958170
Total Suspended Solids	4.0		3.0	mg/L		07-FEB-18	R3957426
	8.46		0.10	рН		02-FEB-18	K3954927
NUCZ, NUS and Sum of NUZ/NUS							
Nitrate (as N)	1.79		0.020	mg/L		02-FEB-18	R3954569
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.79		0.050	mg/L		05-FEB-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		02-FEB-18	R3954569
L2052150-4 ELKRIVER OUTFALL							
Sampled By: HUNGRY BAYTALUKE on 01-FEB-18 @	14:45						
Matrix: WATER							
INISCEIIANEOUS MARAMETERS	.0.050		0.050	mc/l			D2057522
Annonia, Tolai (as N) Arthophosphato Dissolved (as P)	<0.050		0.050	mg/L			R395/532
Coliform Bacteria Eccol	0.073		0.010	CELI/100ml		03-FEB-18	R3953309
Dhosphorus (D)-Total			1	mc/l	08-EED 19	02-FED-10	R39332/1 D2059170
Total Suspended Solids	-2.0		0.020 3.0	ma/l	00-FED-10	03-FEB-10	R3057426
	~5.0		0.0			57120-10	1.0001420

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HUNGRY BAYTALUKE on 01-FEB-18 @	14:45						
Matrix: WATER							
рН	8.28		0.10	рН		02-FEB-18	R3954927
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	9.09		0 020	ma/l		02-FFB-18	R3054560
Nitrate+Nitrite	5.00		0.020	iiig/ E		0212010	10004000
Nitrate and Nitrite (as N)	9.09		0.050	mg/L		05-FEB-18	
Nitrite in Water by IC	~0.010		0.010	ma/l		02-FFB-18	R3054560
	<0.010		0.010	iiig/E		0212010	10004000
Sampled By: HUNGRY BAYTALUKE on 01-FEB-18 @	15:00						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		08-FEB-18	R3957532
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		03-FEB-18	R3953309
Coliform Bacteria - Fecal	5		1	CFU/100mL		02-FEB-18	R3953271
Phosphorus (P)-Total	<0.020		0.020	mg/L	08-FEB-18	09-FEB-18	R3958170
Total Suspended Solids	4.7		3.0	mg/L		07-FEB-18	R3957426
pH	8.45		0.10	рН		02-FEB-18	R3954927
NU2, NU3 and Sum of NU2/NU3							
Nitrate (as N)	1.83 0.020 mg/L					02-FEB-18	R3954569
Nitrate+Nitrite				Ū			
Nitrate and Nitrite (as N)	1.83		0.050	mg/L		05-FEB-18	
Nitrite in Water by iC Nitrite (as N)	<0.010		0.010	mg/L		02-FEB-18	R3954569

### Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Raised	: Dilution required due to high concentration of	of test analyte(s).
Test Method Re	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand ( dissolved oxygen BOD (CBOD) is o	arried out using proced (BOD) are determined I meter. Dissolved BOD determined by adding a	lures adapted from APHA Method 5210B - "Bi by diluting and incubating a sample for a spec 0 (SOLUBLE) is determined by filtering the sar nitrification inhibitor to the diluted sample price	ochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a nple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
The Chemical Ox contain a premixe dichromate. The Oxidizable organ measured colorm into the linear ran	eygen Demand (COD) t ed volume of reagents. COD reagents also cor ic compounds react, re tetrically and a decreas tige.	est is used to estimate the amount of organic The sample is then heated for two hours on th ntain silver and mercury ions. Silver is used as ducing the dichromate ion to green chromic io the in absorbance at 420 nm is proportional to t	matter in the water. The sample is added to COD tubes, which ne COD reactor with a strong oxidizing agent, potassium a catalyst and mercury is used to complex chloride interference. n. For samples in the 10 - 150 mg/L range the remaining Cr6+ is he COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is c Coliform bacteria involves an initial bacteria (Fecal) a	arried out using proced is enumerated by cultu 24 hour incubation at 4 and is used for non-turb	lures adapted from APHA Method 9222 "Mem uring and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriat id water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". Jume is filtered through a 0.45 micron membrane filter. The test e growth medium. This method is specific for thermotolerant
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is c of Chemistry, "Flo al.	arried out, on sulfuric a ow-injection analysis w	cid preserved samples, using procedures mo th fluorescence detection for the determinatio	dified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society n of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion Ch	romatography with conductivity and/or UV de	tection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by lon Ch	rromatography with conductivity and/or UV de	tection.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c persulphate diges	arried out using proced stion of the sample.	lures adapted from APHA Method 4500-P "Ph	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determined hold time from tir	in the laboratory using ne of sampling (field ar	a pH electrode. All samples analyzed by this alysis is recommended for pH where highly a	method for pH will have exceeded the 15 minute recommended ccurate results are needed)
PO4-DO-COL-ED	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c colourimetrically	arried out using procec on a sample that has b	lures adapted from APHA Method 4500-P "Ph een lab or field filtered through a 0.45 micron	osphorus". Dissolved Orthophosphate is determined membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is c (TSS) are determ	arried out using proced ined by filtering a sam	lures adapted from APHA Method 2540 "Solid ble through a glass fibre filter, and by drying th	ls". Solids are determined gravimetrically. Total suspended solids the filter at 104 deg. C.
** ALS test method	ds may incorporate mo	difications from specified reference methods to	o improve performance.
The last two lette	rs of the above test co	de(s) indicate the laboratory that performed ar	alytical analysis for that test. Refer to the list below:

 Laboratory Definition Code
 Laboratory Location

 ED
 ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA

 CL
 ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
---------------	--------	------------------	--------------------

**GLOSSARY OF REPORT TERMS** 

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review. ALS Enviro

SEND REPORT TO:





L2052150-COFC

ł,

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tet: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700 Tox 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587 IS95 - 111 Street, T8V SW1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 Fax: 780-513-2191 Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586 3 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

2150

### CHAIN OF CUSTODY FORM

_		<u> </u>					011/101	~~~				1.1.141			_					PAG	E OF		
CON	IPANY:	NY: FERNIE ALPINE RESORT UTILITIES CORPORATIONS: 1505 - 17TH Avenue South East			ORATION	ATTN	PATRICK MAJER		ALY	SIS	REQI	JEST	TED:										
ADD	RESS:	1505 - 17TH	Avenue South	i East		· · · ·	•		[		Γ				T	Τ		T		<u> </u>	$T_{i}$		
СП		CALGARY		PROV. ALBE	RTA	POSTAL CODE:	T2T 0E2	1										1			1 1 %	F	Ł
TEL		1 - 800 - 25	8 - 7669	FAX: 403 -	244 - 3774	SAMPLER	Hungry Baytatuke	-1										1		1	TALLU	2	
PRO	JECT NAME A	AND NO.:	FARUC-V	Vinter 2017 EMS v	vk # 8 for # 5	QUOTE NO:														/	N	6	
POM	10.:			ALS CONTACT	Lydmyla Shvets	@ALSGlobal.com	n														IN	Ten	Y
		<u>/</u>	<u>ن</u> م '	4/ 🛛 🖿		p najer@skirc	r.com	-							ĺ	1					100	<u> </u>	9
REP	ORT FÖRMAT	Γ:			- 1717			-  s								ł	]				- + •	-	
<u> </u>	14/0#	<b></b>						니통															
	VV()#	s	AMPLE IDENTIF	ICATION	DATE / TIME	COLLECTED	MATRIX	l al	0		thoF	tal P	N-EI	2-62	N-20	S I	2			N	OTES (sample sp	ecific	
<u> </u>					YYYY-MM-DD	TIME		<u> </u>	12	E	ō	ĥ	ź	ž	ž	8	3	'		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mments, due dates	, etc.)	
		WWTP Influ	ent Routine	<i>L</i>	2018 - 2 - 1	14:00	Water	_	X	X							_			temp	<u>= 91</u>	C	
		WWTP Influ	ent BOD	1	2018 - 2 - 1	14:00	Water									×				temp	= /. T	С	
		·		jjj																			
	_	WWTP Efflu	ent Routine	<u></u>	2018 - 2 - 1	14:15	Water		X	X							×			temp	=	С	
		WWTP Efflu	ent BOD	4	2018 - 2 - 1	14:15	Water									X				temp	= 1A 1	с	
		WWTP Efflu	ent Nutrient	5	2018 - 2 - 1	14:15	Water				х	x	x	х	x		_			temp	= 11 12	, C.	
		WWTP Efflu	ent Bacti	6	2018 - 2 - 1	14:15	Water	X							Ī					temp	= 70.p	c	
۲. ۲	-						1														<u> </u>		
8		Elkriver Upst	tram Routine	't	2018 - 2 - 1	14:30	Water		X	х							···   ···			temp	= ^	70	
Я		Elkriver Upst	tream Nutrient	<u> </u>	2018 - 2 - 1	14:30	Water				х	X	X	х	x			+		temp	= 1/1 (	c	
9		Elkriver Upst	tream Bacti 🗸	9	2018 - 2 - 1	14:30	Water	X				Ÿ			-	·				temp	= 11/5	с	
2			· · · · · · · · · · · · · · · · · · ·					1	1			<u> </u>		_				+-+					
6		Elkriver Outfa	all Routine	10	2018 - 2 - 1	14:45	Water	1-	x	x			_				+	┥┦		temp	= 1		
		Elkriver Ou	tfall Nutrient		2018 - 2 - 1	14:45	Water	+			x	x	x	$\overline{\mathbf{x}}$	x			+		temp	//_		
ľ		Elkriver Out	all Bacti	12	2018 - 2 - 1	14:45	Water	x	[						-		+	++	+	temp	- /./		
ľ								-1	-						-+			┼─┦	<u> </u>		- / (- )		
ŀ		Elkriver dowr	nstream Routin	e /3	2018 - 2 - 1	15:00	Water		x	x				-	-+	-		╉╍╍┥	-+				
ŀ		Elkriver dowr	nstream Nutrier	nt 14	2018 - 2 - 1	15:00	Water		<u> </u>	Ĥ	x	×	$\frac{1}{x}$	x	$\frac{1}{x}$			┦─┤	<u> </u>		<u> </u>	<u> </u>	
ŀ		Elkriver down	nstream Recti	15	2018 - 2 - 1	15:00		+		-					$\hat{-}$			┼━┦		1emp	<u>-     </u> 1	<u> </u>	
ŀ					2010-2-1		vvalei	Ļ^	<u> </u>						_			┥──┤		temp	<u> </u>		
		I					· · · ·										<u> </u>	느					
TUR					(surcharge may apply)			RELI		HED	BY:		DA	TE: 2	018 - 2	$\frac{2}{2} - 1$	RECEN		DATE:	4			
								HUN	GRT	BAYI	ALUI	-+	Ti	ME:	5:0	10 pm		(K}_			1		
				<b>ゲ</b> ビー	וקיע					RELI	NQUIS	HED	BY:	-+	DA	TE:			RECEN	ÆD BY:	DATE:		
	HAL INSTRUC					100 4652 OB 5	MALLING						IT	ME:	-				TIME:				
Gree		TIONS.	wastewater@s	kifemie.com	NESULIS IV 250	-423-4002 UK E	-MAIL TO			Coole					Samel	Tomm	arah ura-		<u>ह न</u>			]	
										Y	es deal	No	N/		Frozen	генця ? Ү	es	No ICensete Ice Noce					
				· · · · · · · · · · · · · · · · · · ·						<u> </u>	<u> </u>		_							energe	NC	at 400	

G/OUALITY/00\_DOCUMENTS/10\_AUTHORIZED/FORMS/Hungry's CoC for ALS MI EMS xts



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 15-MAR-18 Report Date: 21-MAR-18 16:48 (MT) Version: FINAL

Client Phone: 403-254-7669

## Certificate of Analysis

Lab Work Order #: L2068142 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - SPRING 2018 EMS WK #1 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 14-MAR-18 @ 14:00							
Matrix: WATER							
Matrix. Marene							
Biochemical Oxygen Demand	99	DLHC	75	mg/L		16-MAR-18	R3993069
Total Suspended Solids	238	DLHC	8.0	mg/L		19-MAR-18	R3990449
рН	8.00		0.10	pH		15-MAR-18	R3986687
L2068142-2 WWTP EFFLUENT							
Sampled By: HB on 14-MAR-18 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		19-MAR-18	R3988309
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-MAR-18	R3993069
Chemical Oxygen Demand	<10		10	mg/L		19-MAR-18	R3988308
Orthophosphate-Dissolved (as P)	0.270		0.010	mg/L		16-MAR-18	R3987001
Coliform Bacteria - Fecal	2		1	CFU/100mL		15-MAR-18	R3986837
Phosphorus (P)-Total	0.282		0.020	mg/L	16-MAR-18	17-MAR-18	R3987271
Total Suspended Solids	<3.0		3.0	mg/L		19-MAR-18	R3990449
pH	8.04		0.10	pН		15-MAR-18	R3986687
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	35.0	DLHC	0.10	ma/l		15-MAR-18	R3986720
	00.0	52.10	0.10	iiig/ E			110000720
Nitrate and Nitrite (as N)	35.0		0.11	mg/L		16-MAR-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLHC	0.050	mg/L		15-MAR-18	R3986720
L2068142-3 ELKRIVER UPSTREAM							
Sampled By: HB on 14-MAR-18 @ 14:30							
Matrix: WATER							
Miscellaneous Parameters	0.050		0.050			40 MAD 40	Deeeeee
Ammonia, Total (as N)	<0.050		0.050	mg/L		19-MAR-18	R3988309
Coliform Bactoria - Eccal	<0.010		0.010	CELI/100mL		10-IVIAR-10	R3987001
Phosphorus (P)-Total	ى 20.020		0.020	ma/l	16 MAD 19	17 MAR 19	R3900037
Total Suspended Solids	57		3.0	mg/L		19-MAR-18	R3990449
pH	8 40		0.10	nH		15-MAR-18	R3986687
NO2, NO3 and Sum of NO2/NO3	0.40		0.10	P			110000007
Nitrate in Water by IC							
Nitrate (as N)	1.89		0.020	mg/L		15-MAR-18	R3986720
Nitrate+Nitrite	4.00		0.070				
Nitrate and Nitrite (as N)	1.89		0.050	mg/L		16-MAR-18	
Nitrite in water by iC Nitrite (as N)	<0.010		0.010	ma/L		15-MAR-18	R3986720
	101010		0.010				
Sampled By: HB on 14-MAR-18 @ 14:45							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		19-MAR-18	R3988309
Orthophosphate-Dissolved (as P)	0.172		0.010	mg/L		16-MAR-18	R3987001
Coliform Bacteria - Fecal	<1		1	CFU/100mL		15-MAR-18	R3986837
Phosphorus (P)-Total	0.175		0.020	mg/L	16-MAR-18	17-MAR-18	R3987271
Total Suspended Solids	<3.0		3.0	mg/L		19-MAR-18	R3990449

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled Bv: HB on 14-MAR-18 @ 14:45							
Matrix: WATER							
рН	8.27		0.10	рН		15-MAR-18	R3986687
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	14.8		0 020	ma/l		15-MAR-18	R3986720
Nitrate+Nitrite			0.020				
Nitrate and Nitrite (as N)	14.8		0.050	mg/L		16-MAR-18	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		15-MAR-18	R3986720
L2068142-5 ELKRIVER DOWNSTREAM							
Sampled By: HB on 14-MAR-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters	<0.050		0.050	ma/l		19-MAR-18	P3088300
Orthophosphate-Dissolved (as P)	<0.030		0.010	mg/L		16-MAR-18	R3987001
Coliform Bacteria - Fecal	<1		1	CFU/100mL		15-MAR-18	R3986837
Phosphorus (P)-Total	<0.020		0.020	mg/L	16-MAR-18	17-MAR-18	R3987271
Total Suspended Solids	5.0		3.0	mg/L		19-MAR-18	R3990449
рН	8.42		0.10	рН		15-MAR-18	R3986687
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	1 01		0.020	ma/l		15-MAR-18	P3086720
Nitrate+Nitrite	1.91		0.020	ing/∟		13-IVIAR-10	K3900720
Nitrate and Nitrite (as N)	1.91		0.050	mg/L		16-MAR-18	
Nitrite (as N)	<0.010		0.010	mg/L		15-MAR-18	R3986720

### Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Raise	d: Dilution required due to high concentration	of test analyte(s).
MS-B	Matrix Spike recovery	could not be accurately calculated due to his	gh analyte background in sample.
Test Method R	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand dissolved oxyger BOD (CBOD) is	carried out using proceed (BOD) are determined n meter. Dissolved BOE determined by adding a	dures adapted from APHA Method 5210B - " by diluting and incubating a sample for a spe 0 (SOLUBLE) is determined by filtering the s a nitrification inhibitor to the diluted sample p	Biochemical Oxygen Demand (BOD) <sup>*</sup> . All forms of biochemical ccified time period, and measuring the oxygen depletion using a ample through a glass fibre filter prior to dilution. Carbonaceous rior to incubation.
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
The Chemical O contain a premix dichromate. The Oxidizable organ measured colorn into the linear ra	xygen Demand (COD) ed volume of reagents. COD reagents also co nic compounds react, re netrically and a decreas nge.	test is used to estimate the amount of organi The sample is then heated for two hours on intain silver and mercury ions. Silver is used a iducing the dichromate ion to green chromic se in absorbance at 420 nm is proportional to	c matter in the water. The sample is added to COD tubes, which the COD reactor with a strong oxidizing agent, potassium as a catalyst and mercury is used to complex chloride interference. ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is the COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is o Coliform bacteria involves an initia bacteria (Fecal)	carried out using procee a is enumerated by cult I 24 hour incubation at and is used for non-turk	dures adapted from APHA Method 9222 "Me uring and colony counting. A known sample 44.5 degrees C of the filter with the appropria bid water with a low background bacteria leve	mbrane Filter Technique for Members of the Coliform Group". volume is filtered through a 0.45 micron membrane filter. The test ate growth medium. This method is specific for thermotolerant el.
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is of of Chemistry, "Fallenging of Chemistry, "Fallenging of the second	carried out, on sulfuric a low-injection analysis w	acid preserved samples, using procedures m ith fluorescence detection for the determinat	odified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society ion of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion Cl	nromatography with conductivity and/or UV d	letection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion Cl	nromatography with conductivity and/or UV d	letection.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is o persulphate dige	carried out using proced stion of the sample.	dures adapted from APHA Method 4500-P "F	Phosphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determined hold time from ti	d in the laboratory using me of sampling (field ar	a pH electrode. All samples analyzed by thi nalysis is recommended for pH where highly	s method for pH will have exceeded the 15 minute recommended accurate results are needed)
PO4-DO-COL-E	D Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using procee on a sample that has b	dures adapted from APHA Method 4500-P "F een lab or field filtered through a 0.45 micro	Phosphorus". Dissolved Orthophosphate is determined n membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is ( (TSS) are deterr	carried out using procee nined by filtering a sam	dures adapted from APHA Method 2540 "Sol ple through a glass fibre filter, and by drying	ids". Solids are determined gravimetrically. Total suspended solids the filter at 104 deg. C.
** ALS test metho	ds may incorporate mo	difications from specified reference methods	to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Chain of Custody Num	n of Custody Numbers:		

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review. **ALS Environmental** 

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Tol: Free: 1-809 005 5049. For 604 059 6709



L2068142-COFC

PAGE

vr\_

### CHAIN OF CUSTODY FORM

Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 485, Tel: 780-791-1524 Fax Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toli Free: 1-80

Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Fr

Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1

SEN										<u> </u>	<u>- 0</u>	1 / 141											UF.	
сом	IPANY:	FERNIE ALP	INE RESORT	UTILITIES CORP	ORATION	ATTN:	PATRICK MAJER		ALYS	SIS R	REQL	JEST	ED:	1			r		- 1	— <del>—</del> т		+		
ADD	RESS:	1505 - 17TH	Avenue South	East		<u>,                                     </u>												- 1				L	6-	+
сптү	<i>c</i> ;	CALGARY		PROV: ALBE	RTA	POSTAL CODE:	T2T 0E2														7	i wol	2	I
TEL:	:	1 - 800 - 25	8 - 7669	FAX: 403 -	244 - 3774	SAMPLER:	Hungry Baytaluke															MI	· .	
PRO	JECT NAME A	ND NO.:	FARUC-S	pring 2018 EMS v	vk # 1	QUOTE NO:																- K	- 00	
POI	NO.:			ALS CONTAC	r: Lydmyla Shvets	@ALSGlobal.com	n										1					$\odot$		
					- 1\ / 4	p naje r@skirc	r.com																	ſ
REP	ORT FORMAT	:	│ <sup>└┙</sup> ▋ │ ┌┐ ▋	╶╴┖──				form																ľ
<u> </u>	10(0#	r —					<u> </u>	<sup>1</sup> 8			٩	L.	z	z	z	<u>ہ</u>					-			acific
	4404	s	AMPLE IDENTIF	ICATION			MATRIX	ecal	SS	Ŧ	₩	[otal	Ë	ğ	ğ		8				-   ·	comments, d	ue dates	, etc.)
┣	T	MAA/TP Influ	ent Routine	A	2018 - 3 - 14	14:00	Water	<u>_</u>		x	۲Ť,		1		-						ten	ip = /	100	c
			ent BOO		2018 - 3 - 14	14:00	Water		<u>                                      </u>		┼──				-	x			- 1		terr	up = /	1	с
					2010 0 14	+			<u> </u>	<u>† – i</u>	+													•
	┣	NARA/TR EM	uent Routine		2018 - 3 - 14	14:15	Water	<del></del> -	$\frac{1}{x}$	$\mathbf{x}$	┼─		<u> </u>				x				terr	ıp =		ç
		WAAATD Eff	ent BOD	<u> </u>	2018 - 3 - 14	14:15	Water		$\vdash$		<del>                                     </del>	┿──	$\vdash$	-		х					terr	ıp =	1	/c
	<b> </b>		jent Nutrient	Ţ	2018-3-14	14:15	Water		<u> </u>	<u>+</u>	X	x	x	x	х				-		terr	1p = /	7.(	) C
			ent Bacti	<u> </u>	2018-3-14	14:15	Water	×	+	$\vdash$	┼━	┢	<del>                                     </del>			<u> </u>					ten	1p = /	ΛŪ	c
SE ONLY					2				+	$\vdash$	+	1	$\vdash$										·	
	}	Elkriver Line	tram Routine		2018 - 3 - 14	14:30	Water		x	1 x	1	┼──	$\vdash$	-			···				ten	1 = qr	, [	с
	┣	Fikriver Line	tream Nutrient	<u> </u>	2018 - 3 - 14	14:30	Water		1		$\mathbf{x}$	x	x	x	х						ten	1p = /	4	с
١s	┣		tream Recti	<u>a</u>	2018 - 3 - 14	14-30	Water		+	+	+	┢	+	1-		†	-				ten	1p = [, `		С
[۲	<b> </b>			7_			+	-1	+	+	+	+	$\vdash$	†			<u> </u>					K	1	
١ <u></u>		Elkriver Out	fall Routine		2018 - 3 - 14	14:45	Water		×	T <sub>x</sub>	+		$\vdash$								ten	1p = 🧹	77	с
۳	ļ	Elkriver O	utfall Nutrient	<u> </u>	2018 - 3 - 14	14:45	Water		+	┼╾╍	x	x	x	x	х						ten	np =		n c
	· · · · · · · · · · · · · · · · · · ·	Elkriver Out	fall Bacti	 	2 2018 - 3 - 14	14:45	Water	<b>-</b>	$\uparrow$	+	+	1	1-	1			1	<u> </u>			ter	np = /	- ¥	́с
1						+	1		+	+	+-	$\uparrow$	1	† <b>-</b>		1		†						
		Elkriver dow	mstream Routie	ne /7	2018 - 3 - 14	15:00	Water		x	$\frac{1}{x}$	1-	1-	$\top$	1			1				ter	np =	Τ	С
		Elkriver dov	vostream Nutrie	ent 14	2018 - 3 - 14	15:00	Water		+	+-	†x	T x	x	x	x	<u> </u>	1	1		-	ter	np =	/	с
		Elkriver dow	vnstream Barti	<u> </u>	2018 - 3 - 14	15:00	Water	$+\overline{x}$	+	+	1	$\top$	+				1	1			ter	np =		С
	<b> </b>			· · · · · · · · · · · · · · · · · · ·	<u>}</u>		+		+		-	+	+	1		$\square$		1	<u> </u>					$h_{L}$
	<b>_</b>	<b></b>				<u></u>	(surcharbe may apply)			REL	.INQU	ISHED	) BY:	4		DATE:	201	8 - 3	- 14	RECE	EIVED	: DATE	31	15-
TU	RN AROUND I	REQUIRED:	∣ᄬᠠᠺ		N CONTRACT	···				HUI	NGR	( BAY	TALL	JKE		TIME:		5:0	)0 pm		120		0	QU
SE	ND INVOICE T	0:			<b>HI</b>	—	RF			REL	.INQU	ISHE	) BY:			DATE:				RECE	EIVED BY	DATI		
	OICE FORMA	<u>т.</u>	┤╔╻┛	<b>T</b> ''		<b>}</b>							-	,		TIME:		,				тіма		
SP	ECIAL INSTRU	ICTIONS:	PLEASE FAX	A COPY OF TH	E RESULTS TO 2	50-423-4652 OR	E-MAIL TO	•		FO	RLA	BUS	SE O	NLY			<u> </u>	$\mathcal{L}$	Ŧ					
		wastewater@skifemie.com							Cooler Seal Intact?					Sam	ple Te	emper	atùre;	<u>¥</u> -	<u>°C</u>	Cooling (	Method?			
										1	Yes	Nc	<u>`                                    </u>	<u>N/A</u>	]Froz	.en? _	Ye	s	No		lceps	icks	<u>*</u>	NONé



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 22-MAR-18 Report Date: 29-MAR-18 14:09 (MT) Version: FINAL

Client Phone: 403-254-7669

## Certificate of Analysis

Lab Work Order #: L2071001 Project P.O. #: NOT SUBMITTED Job Reference: FARUC- SPRING 2018 EMS WK#2 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

FARUC- SPRING 2018 EMS WK#2

L2071001 CONTD.... PAGE 2 of 5 Version: FINAL

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HUNGRY BAYTALUKE on 21-MAR-18 @	14.00						
Matrix: WATER	11.00						
Miscellaneous Parameters							
Biochemical Oxygen Demand	93	DLHC	75	mg/L		23-MAR-18	R3999291
Total Suspended Solids	196	DLHC	10	mg/L		26-MAR-18	R3996318
рН	7.87		0.10	pН		27-MAR-18	R3996929
L2071001-2 WWTP EFFLUENT							
Sampled By: HUNGRY BAYTALUKE on 21-MAR-18	14:15						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		26-MAR-18	R3995667
Biochemical Oxygen Demand	<2.0		2.0	mg/L		23-MAR-18	R3999291
Chemical Oxygen Demand	17		10	mg/L		27-MAR-18	R3996940
Orthophosphate-Dissolved (as P)	0.703	DLHC	0.050	mg/L		23-MAR-18	R3994659
Coliform Bacteria - Fecal	800	DLA	100	CFU/100mL		22-MAR-18	R3994579
Phosphorus (P)-Total	0.751		0.020	mg/L	27-MAR-18	28-MAR-18	R3997798
Total Suspended Solids	<3.0		3.0	mg/L		26-MAR-18	R3996318
	7.97		0.10	рН		27-MAR-18	R3996929
NO2, NO3 and Sum of NO2/NO3							
Nitrate in water by iC Nitrate (as N)	14.3		0 020	ma/l		22-MAR-18	R3994246
Nitrate+Nitrite	11.0		0.020				10001210
Nitrate and Nitrite (as N)	14.3		0.050	mg/L		23-MAR-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		22-MAR-18	R3994246
L2071001-3 ELKRIVER UPSTREAM							
Sampled By: HUNGRY BAYTALUKE on 21-MAR-18	14:30						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Iotal (as N)	<0.050		0.050	mg/L		26-MAR-18	R3995667
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		23-MAR-18	R3994659
Collform Bacteria - Fecal	18		1	CFU/100mL	07 140 40	22-MAR-18	R3994579
Phosphorus (P)-1 otal	<0.020		0.020	mg/L	27-MAR-18	28-MAR-18	R3997798
	<3.0		3.0	nig/L		20-IVIAR-10	R3996318
NO2 NO3 and Sum of NO2/NO3	0.31		0.10	pri		27-IVIAIX-10	K3990929
Nitrate in Water by IC							
Nitrate (as N)	2.01		0.020	mg/L		22-MAR-18	R3994246
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	2.01		0.050	mg/L		23-MAR-18	
Nitrite in Water by IC	-0.010		0.010	ma/l		22 MAD 19	P2004246
	<0.010		0.010	iiig/L		22-10/411-10	K3994240
Sampled By: HUNGRY RAVIALUKE on 21 MAD 19 6	11.15						
Matrix: WATED	5 14.4J						
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	ma/L		26-MAR-18	R3995667
Orthophosphate-Dissolved (as P)	0.111		0.010	ma/L		23-MAR-18	R3994659
Coliform Bacteria - Fecal	91		1	CFU/100mL		22-MAR-18	R3994579
Phosphorus (P)-Total	0.116		0.020	mg/L	27-MAR-18	28-MAR-18	R3997798
Total Suspended Solids	6.0		3.0	mg/L		26-MAR-18	R3996318

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HUNGRY BAYTALUKE on 21-MAR-18 @	⊉ 14:45						
Matrix: WATER	_						
рН	8.18		0.10	рН		27-MAR-18	R3996929
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	2.80		0.020	ma/l		22-MAR-18	P300/2/6
Nitrate+Nitrite	2.00		0.020	ing/E		22 10/11/10	10004240
Nitrate and Nitrite (as N)	2.80		0.050	mg/L		23-MAR-18	
Nitrite in Water by IC	~0.010		0.010	ma/l		22-MAR-18	R3004246
	<0.010		0.010	ing/E			1(3334240
Sampled By: HUNGRY BAYTALUKE on 21-MAR-18 @	2 15:00						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		26-MAR-18	R3995667
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		23-MAR-18	R3994659
Coliform Bacteria - Fecal	9		1	CFU/100mL		22-MAR-18	R3994579
Phosphorus (P)-Total	<0.020		0.020	mg/L	27-MAR-18	28-MAR-18	R3997798
Total Suspended Solids	3.3		3.0	mg/L		26-MAR-18	R3996318
p⊟ NO2_NO3 and Sum of NO2/NO3	8.32		0.10	рн		27-MAR-18	R3996929
Nitrate in Water by IC							
Nitrate (as N)	2.03		0.020	mg/L		22-MAR-18	R3994246
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	2.03		0.050	mg/L		23-MAR-18	
Nitrite (as N)	<0.010		0.010	mg/L		22-MAR-18	R3994246

- 1101 - ---

## **Reference Information**

### Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

#### Test Method References: ALS Test Code Matrix Method Reference\*\* **Test Description** BOD-BC-CL Biochemical Oxygen Demand (BOD) APHA 5210 B-5 day Incub.-O2 electrode Water This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation. COD-T-COL-CL Water Chemical Oxygen Demand (COD) APHA 5220 D Colorimetry The Chemical Oxygen Demand (COD) test is used to estimate the amount of organic matter in the water. The sample is added to COD tubes, which contain a premixed volume of reagents. The sample is then heated for two hours on the COD reactor with a strong oxidizing agent, potassium dichromate. The COD reagents also contain silver and mercury ions. Silver is used as a catalyst and mercury is used to complex chloride interference. Oxidizable organic compounds react, reducing the dichromate ion to green chromic ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is measured colormetrically and a decrease in absorbance at 420 nm is proportional to the COD. Samples with concentrations > 150 mg/L can be diluted into the linear range. FCC-MF-CL Water Fecal Coliform Count-MF APHA 9222D This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level. N2N3-CALC-CL Water Nitrate+Nitrite CALCULATION NH3-F-CL Water Ammonia by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al. NO2-IC-N-CL Water Nitrite in Water by IC EPA 300.1 (mod) Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. NO3-IC-N-CL Water Nitrate in Water by IC EPA 300.1 (mod) Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. P-T-COL-ED Total P in Water by Colour **APHA 4500-P PHOSPHORUS** Water This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample. APHA 4500 H-Electrode PH-CL Water bН pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)

PO4-DO-COL-ED

Diss. Orthophosphate in Water by Colour APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

TSS-CL Water Total Suspended Solids

Water

APHA 2540 D-Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Chain of Custody Num	bers:		

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

### **ALS Environmental**

www.alsenviro.com

ANALYTICAL CHEMISTRY & TESTING SERVICES



Management Book 1000 Themeth Owner MOL 4K5, Tak 204 050 4108, Toll Free: 1-800-665-0243, Fax: 604-253-6700 -261-5517 Fax: 250-261-5587 Toll Free: 1-800-668-9878 Fax: 780-513-2191 )1-1524 Fax: 780-791-1586 oll Free; 1-800-668-9878 Fax: 780-437-2311 9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298 Toll Free: 1-800-667-7645 Fax: 306-668-8383

1001

SEND	REPORT T	0:						UTAN UP	000	<u></u>	וט	<u>, J</u>	RM			_						PAGE		OF	
COM	PANY:	FERNIE AL	PINE RESORT	UTILITIES	CORPO	RATION	ATTN:	PATRICK MAJER	AN	ALY	YSIS REQUESTED:														
ADDF	ESS:	1505 - 17TH	Avenue South	East														1		1					
CITY:		CALGARY		PROV:	ALBER	TA	POSTAL CODE:	T2T 0E2																	
TEL:		1 - 800 - 25	58 - 7669	FAX:	403 - 2	44 - 3774	SAMPLER:	Hungry Baytaluke																	
PROJ		AND NO.:	FARUC-S	pring 2018	EMS wk	#2	QUOTE NO:																		
PO N	0.:	T		ALS CO	DNTACT:	Lydmyla Shvets	@ALSGlobal.co	m												Ì					
REPC	ORT FORMA	T:				- N/I /	p <u>paier@skirc</u>	x,com	oliforms																
	WO#		SAMPLE IDENTIF	- ICATIÓN	-	DATE / TIME	COLLECTED	MATRIX		S		р Ц	al P	N-C	N-E0	25-N	05	8				NO	íES (san	uple spe dates	cific etc.)
L						YYYY-MM-DD	TIME			12	<u><u> </u></u>	δ	ř	ź	ž	ž	80	<u></u>		-+					<del></del>
	<u> </u>	WWTP Infl	uent Routine		<u> </u>	2018 - 3 - 21	14:00	Water		×	<u> </u>									$\rightarrow$		temp =	_₩	<u> </u>	<u></u>
	~~~ <b>`</b>	WWTP Infl	uent BOD		2	2018 - 3 - 21	14:00	Water		<u> </u>											-+	temp =	<u> </u>		
		· · · ·				<u> </u>				1			ļ.									·			
	(	WWTP Eff	uent Routine		<u> </u>	2018 - 3 - 21	14:15	Water		X	X							<u>×</u>		$\rightarrow$		temp =			$\frac{c}{7}$
	·	WWTP, Effi	uent BOD		4	2018 - 3 - 21	14:15	Water			1						<u>×</u>					temp =	_1	71	$\frac{1}{2}$
		WWTP Eff	uent Nutrient		5	2018 - 3 - 21	14:15	Water			-	X	X	X	X	Χ.				-		temp =	$-\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	-	<u>- c</u>
	(	WWTP Eff	vent Bacti	. i	6	2018 - 3 - 21	14;15	Water	<u> </u>	<u> </u>				<u> </u>		<u> </u>				$\square$		temp =		<u> </u>	C
날			<u>v</u>		<u> </u>					1			 					-			-+				
Ó	(	Elkriver Up	stram Routine		10	2018 - 3 - 21	14:30	Water		<u> </u>	×		<u> </u>							$\vdash$		temp =		-1	
ISI ISI		Elkriver Up	stream Nutrient	_	ð	2018 - 3 - 21	14:30	Water				×	×	×		×				$\vdash$		temp =		7	<u> </u>
R		Elkriver Up	stream Bacti		<u>9</u> _	2018 - 3 - 21	14:30	Water	×			<u> </u>		<u> </u>	<u> </u>							temp =		e)	
Ē		,			<u> </u>				_					-						┝╌┥		<u> </u>		_	
۱۳	C	Elkriver Ou	tfall Routine		2	2018 - 3 - 21	14:45	Water	_		<u> ×</u>	<u> </u>	<u> </u>	<u> </u>	-					<u>     </u>		temp =		$\leq$	
		Elkriver O	utfall Nutrient		1	2015 - 3 - 21	14:45	Water			_	×	×	X	X	×				┝──┨	<u> </u>	temp =		+	<u> </u>
		Elkriver Ou	tfall Bacti	!	12	2018 - 3 - 21	14:45	Water	-×		+	<u> </u>			ļ					┝──┦	<u> </u>	temp =			
		,			17	<u> </u>						┨								┢──┥				· 1	<u> </u>
		Elkriver do	wnstream Routi	ne	12	2018-3-21	15:00	Water		×	<u>  ×</u>				<del> </del> -							temp =	4	_	<u> </u>
	ح>	Elkriver do	wnstream Nutrie	ent	14	2018 - 3 - 21	15:00	Water		-	+	<u> ^</u>		<u>⊢</u>	<u> </u> ^	×		ļ		$\left  - \right $	$\rightarrow$	temp -		<del>}_</del> +	<u> </u>
		Elkriver do	wnstream Bacti		15	2018 - 3 - 21	15:00	Water	×			<u> </u>			┨━───		<b> </b>		-			temp -		-+-	<u> </u>
	$ \_ $					L		<u> </u>	L	J	+						1							\$1	$\frac{1}{\sqrt{2}}$
TUR	N AROUND	REQUIRED:	•   K	φ ]	R	SPECIFY DATE	:	(surcharge may apply)			REL			BY:	IVE	<u> </u>	DATE:	201	5-3- 5-0	- <u>2</u> 1			DATE:	0	分
											HU	NGRI	BAT			-	TIME:	-		o pin			DATE:	<u> </u>	70
SEN		<u> </u>	-  ≥ _	ĻΓ	۲	קיע					REL	.INQU	ISHEE	J BY:		<u> </u>	JATE:				RECEIV	EUBT:	UATE:		
INVO							0.423.4652 OP	E-MAIL TO			FO	RIĂ	BUS	E O			TIME:	I					TIME:		
SPE	ÇIAL INSTRI	UCTIONS:	wastewater@	skifemie.co	n Smi	RESULIS IU ZE						ler Se	al Inte	<u>,</u> id?		Sam	pie Te	mpen	ature: _	7		oling Meth	od?		
												Yes	Na		N/A	Froz	en7	Ye	s Ī	No		Icepacks	Ice	N	lone



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:29-MAR-18Report Date:06-APR-18 15:42 (MT)Version:FINAL

Client Phone: 403-254-7669

## Certificate of Analysis

Lab Work Order #: L2073990 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - SPRING 2018 EMS WK #3 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L 2073990-1 WWTP INFLUENT							
Sampled By: HB on 28-MAR-18 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	97	DLHC	20	mg/L		29-MAR-18	R4004519
Total Suspended Solids	113	DLHC	8.0	mg/L		03-APR-18	R4004697
pН	7.51		0.10	pН		06-APR-18	R4006171
L2073990-2 WWTP EFFLUENT							
Sampled By: HB on 28-MAR-18 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		02-APR-18	R4002475
Biochemical Oxygen Demand	<2.0		2.0	mg/L		29-MAR-18	R4004519
Chemical Oxygen Demand	13		10	mg/L		02-APR-18	R4003550
Orthophosphate-Dissolved (as P)	0.485		0.010	mg/L		31-MAR-18	R4000713
Colliorm Bacteria - Fecal	48		1	CFU/100mL		29-MAR-18	R4000574
Total Supported Solida	0.537		0.020	mg/L	04-APR-18	05-APR-18	R4005480
	<3.0		3.0	nig/L		06 APR-10	R4004697
P⊓ NO2_NO3 and Sum of NO2/NO3	7.04		0.10	рп		00-AFR-10	R4006171
Nitrate in Water by IC							
Nitrate (as N)	34.2	HTD	0.10	mg/L		02-APR-18	R4001868
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	34.2		0.10	mg/L		02-APR-18	
Nitrite in Water by IC	0.040		0.040			00 MAD 40	D 4004000
	<0.010		0.010	mg/L		29-MAR-18	R4001868
L2073990-3 ELKRIVER UPSTREAM							
Sampled By: HB on 28-MAR-18 @ 14:30							
Matrix: WATER							
Ammonia Total (as N)	~0.050		0.050	ma/l		02-APR-18	R4002475
Orthophosphate-Dissolved (as P)	<0.000		0.000	mg/L		31-MAR-18	R4000713
Coliform Bacteria - Fecal	5		1	CFU/100mL		29-MAR-18	R4000574
Phosphorus (P)-Total	<0.020		0.020	ma/L	04-APR-18	05-APR-18	R4005480
Total Suspended Solids	4.7		3.0	mg/L		03-APR-18	R4004697
рН	8.25		0.10	рН		06-APR-18	R4006171
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	2.09		0.020	mg/L		29-MAR-18	R4001868
NITRATE+NITITE Nitrate and Nitrite (as N)	2 00		0.050	ma/l		02-APR-18	
Nitrite in Water by IC	2.09		0.050	ing/∟		02-AI 11-10	
Nitrite (as N)	<0.010		0.010	mg/L		29-MAR-18	R4001868
L2073990-4 ELKRIVER OUFALL							
Sampled By: HB on 28-MAR-18 @ 14:45							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		02-APR-18	R4002475
Orthophosphate-Dissolved (as P)	0.071		0.010	mg/L		31-MAR-18	R4000713
Coliform Bacteria - Fecal	21		1	CFU/100mL		29-MAR-18	R4000574
Phosphorus (P)-Total	0.086		0.020	mg/L	04-APR-18	05-APR-18	R4005480
Total Suspended Solids	13.3		3.0	mg/L		03-APR-18	R4004697
		1					

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 28-MAR-18 @ 14:45							
Matrix: WATER							
рН	8.05		0.10	рН		06-APR-18	R4006171
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	5.95		0.020	mg/L		29-MAR-18	R4001868
Nitrate+Nitrite				_			
Nitrate and Nitrite (as N)	5.95		0.050	mg/L		02-APR-18	
Nitrite (as N)	<0.010		0.010	mg/L		29-MAR-18	R4001868
L2073990-5 ELKRIVER DOWNSTREAM							
Sampled By: HB on 28-MAR-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters Ammonia, Total (as N)	<0.050		0.050	ma/l		02-APR-18	R4002475
Orthophosphate-Dissolved (as P)	<0.010		0.010	ma/L		31-MAR-18	R4000713
Coliform Bacteria - Fecal	4		1	CFU/100mL		29-MAR-18	R4000574
Phosphorus (P)-Total	<0.020		0.020	mg/L	04-APR-18	05-APR-18	R4005480
Total Suspended Solids	3.3		3.0	mg/L		03-APR-18	R4004697
pН	8.25		0.10	рН		06-APR-18	R4006171
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	2 16		0.020	ma/l		20 MAD 19	P4001969
Nitrate+Nitrite	2.10		0.020	ing/∟		29-IVIAIN-10	R4001000
Nitrate and Nitrite (as N)	2.16		0.050	mg/L		02-APR-18	
Nitrite (as N)	<0.010		0.010	mg/L		29-MAR-18	R4001868

### Sample Parameter Qualifier Key:

Qualifier	Description							
DLHC	Detection Limit Raised	d: Dilution required due to high concentration	on of test analyte(s).					
HTD	Hold time exceeded for	or re-analysis or dilution, but initial testing w	as conducted within hold time.					
Test Method Ro	eferences:							
ALS Test Code	Matrix	Test Description	Method Reference**					
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode					
This analysis is o oxygen demand dissolved oxyger BOD (CBOD) is o	carried out using proceed (BOD) are determined a meter. Dissolved BOE determined by adding a	dures adapted from APHA Method 5210B - by diluting and incubating a sample for a sp 0 (SOLUBLE) is determined by filtering the a nitrification inhibitor to the diluted sample	"Biochemical Oxygen Demand (BOD)". All forms of biochemical becified time period, and measuring the oxygen depletion using a sample through a glass fibre filter prior to dilution. Carbonaceous prior to incubation.					
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry					
The Chemical O: contain a premix dichromate. The Oxidizable organ measured colorn into the linear ran	The Chemical Oxygen Demand (COD) test is used to estimate the amount of organic matter in the water. The sample is added to COD tubes, which contain a premixed volume of reagents. The sample is then heated for two hours on the COD reactor with a strong oxidizing agent, potassium dichromate. The COD reagents also contain silver and mercury ions. Silver is used as a catalyst and mercury is used to complex chloride interference. Oxidizable organic compounds react, reducing the dichromate ion to green chromic ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is measured colormetrically and a decrease in absorbance at 420 nm is proportional to the COD. Samples with concentrations > 150 mg/L can be diluted into the linear range.							
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D					
This analysis is o Coliform bacteria involves an initia bacteria (Fecal) a	carried out using proceed is enumerated by culti 24 hour incubation at and is used for non-turk	dures adapted from APHA Method 9222 "M uring and colony counting. A known sample 44.5 degrees C of the filter with the approp oid water with a low background bacteria le	embrane Filter Technique for Members of the Coliform Group". e volume is filtered through a 0.45 micron membrane filter. The test riate growth medium. This method is specific for thermotolerant vel.					
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION					
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC					
This analysis is o of Chemistry, "Fl al.	carried out, on sulfuric a ow-injection analysis w	acid preserved samples, using procedures ith fluorescence detection for the determina	modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society ation of trace levels of ammonium in seawater", Roslyn J. Waston et					
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)					
Inorganic anions	are analyzed by Ion Cl	nromatography with conductivity and/or UV	detection.					
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)					
Inorganic anions	are analyzed by Ion Cl	nromatography with conductivity and/or UV	detection.					
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS					
This analysis is o persulphate dige	carried out using proced stion of the sample.	dures adapted from APHA Method 4500-P	"Phosphorus". Total Phosphorus is determined colourimetrically after					
PH-CL	Water	рН	APHA 4500 H-Electrode					
pH is determined hold time from tir	l in the laboratory using me of sampling (field ar	a pH electrode. All samples analyzed by t nalysis is recommended for pH where highl	his method for pH will have exceeded the 15 minute recommended y accurate results are needed)					
PO4-DO-COL-EI	D Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS					
This analysis is c colourimetrically	carried out using proced on a sample that has b	dures adapted from APHA Method 4500-P een lab or field filtered through a 0.45 micr	"Phosphorus". Dissolved Orthophosphate is determined on membrane filter.					
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric					
This analysis is o (TSS) are detern	carried out using procee nined by filtering a sam	dures adapted from APHA Method 2540 "S ple through a glass fibre filter, and by dryin	olids". Solids are determined gravimetrically. Total suspended solids g the filter at 104 deg. C.					
** ALS test metho	ds may incorporate mo	difications from specified reference method	Is to improve performance.					

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Chain of Custody Num	bers:		

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.
#### **ALS Environmental**

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, VSL 1K5, Tel: 604-253-4188 Toil Free: 1-800-665-024 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tei: 250-261-5517 Fax: 250-261-Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toil Free: 1-800-668-98: Fort McMurray AB, Bay 1, 245 Macdenald Cr, T9H 485, Tel: 780-791-1524 Fax: 780-791-1 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toil Free: 1-800-668-987 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toil Free: 1-800-667-7.



PAGE

U۲

### CHAIN OF CUSTODY FORM

SENC	REPORT				RATION		PATRICK MAJER	AN/	ALYS	IS R	EQU	EST	ED:												
COMI	PANY:	FERNIE ALP							- 1	T			_	Т	- T		<u> </u>					- 1	_ ( <	A	l
ADDF	RESS:	1505 - 17TH	Avenue South				T2T 0E2									1			Í			A	1 m	lol	
CITY		CALGARY		PROV: ALBER		POSTAL CODE:	Hungor Baytaluke															7	$\sim \sim \sim$		l
TEL:		1 - 800 - 25	8 - 7669	FAX: 403 - 24	14 - 3774	SAMPLER	Hungry Baytalake											1				പ്പ്			
PRO.	IECT NAME A	ND NO.:	FARUC-S	pring 2018 EMS wk	#3	QUOTE NO:							ł							1		0	้ ส	C	
PO N	0.:			ALS CONTACT:	Lydmyla Shvets	@ALSGlobal.co	m	4									]					x	<u></u>		
REPO	ORT FORMAT	Г:		┨ <mark>╱╴╗┣━╸</mark>	- \\ / / ⋈		<u>27.00m</u>	liforms																	ļ
	WO#	<u> </u>			DATE / TIME	COLLECTED		۱ŭ			<u>ا م</u>	d l	Z	z l	Z-N	8						NOTE	S (sample s	pecific	
		s	AMPLE IDENTIF	TICATION	YYYY-MM-DD	TIME		l Se	TSS	Ŧ	Ð	Tot	Η̈́Ζ	ĝ	ş	8	8				$\perp$	comine	ms, oue care	(a, etc.)	1
		WW/TP Influ	ent Routine		2018 - 3 - 28	14:00	Water		х	x											te	+mp =	1/-/	<u> </u>	-
			ent BOD		2018 - 3 - 28	14:00	Water								_	х					te	3mp =	11.	<u>p</u> c	1
						<u></u>	<u>+</u>																		1
		MAAATTO EAN	uent Routine	7	2018 - 3 - 28	14:15	Water	$\mathbf{T}$	x	X							x				tr	emp =		c	1
				<u> </u>	2018 - 3 - 25	14:15	Water	1							_	х					t	emp =	12	20	
		WWIP Emi			2018 3 28	14:15	Water				х	x	x	х	x						ŧ	emp =	144	h c	
		WWTP Effic			2010 - 3 - 20	14:15	Water	1 x	1			-			•			_			t	emp =	<i>t</i>	c	]
		WWTP Effi	uent Bacti		2016 - 3 - 20	14.13		+				$\vdash$								- 1-					1
L 고				- 7		44.00	10/minr	┥─	+ <del>v</del>	×										-+	<b></b> [;	emp =	1	<u>)</u> c	1
ð		Elkriver Ups	stram Routine	Ŧ	2018 - 3 - 28	14:30	Water		Ê	<u> </u> ^-	x	X	X	x	x	<u> </u>					;	emp =	1	7 c	1
ŝ		Elkriver Ups	stream Nutrien		2018 - 3 - 28	14:30	vvater	÷	-		<u> </u>	<u> </u>		<u> </u>	- <u>-</u>				-	-		emp =	10	/	1
ΒB		Elkriver Up:	stream Bacti	7	2018 - 3 - 28	14:30	vvater	+^		+		ļ	-		-							· · · · · · · · · · · · · · · · · · ·			1
цЧ					<u> </u>	*	<u> </u>								_					$\rightarrow$	-+		_	<u>/</u> c	-
G		Elkriver Ou	tfall Routine		2018 - 3 - 28	14:45	Water		<u> </u>	<u>×</u>	-	<u> </u>		<u> </u>				┞╌┦					7-		-
		Elkriver O	utfall Nutrien	t <u>//     </u>	2018 - 3 - 28	14:45	Water	4			X	<u> </u>	×	· ·	<u>  ^</u>		-			$\rightarrow$	-+	emp -	$\overline{}$	<u>6</u>	-{
		Elkriver Ou	tfall Bacti	12	2018 - 3 - 28	14:45	Water	<u>×</u>	4					<b> </b>				┞╴╿				emp +		~ 0	-
	<u> </u>				•			4_	<u> </u>			_	_				-	┝──┤			-+				-
1		Elkriver do	wnstream Rout	íne 13.	2018 - 3 - 28	15:00	Water		X	×	1	1		<b> </b>	ļ							emp =	A	$\frac{c}{c}$	-
l	<b>⊢</b> −−	Elkriver do	wnstream Nutr	ient 74	2018 - 3 - 28	15:00	Water		<u> </u>		X	X	×	×	<u>x</u>			<u>                                     </u>				temp =	-/	$\mathbf{r}$	4
		Elkriver do	wnstream Bact	1 16	2018 - 3 - 28	15:00	Water	X			1	<u> </u>			<u> </u>		<u> </u>					temp =	10	<u> </u>	_
					+																				4.
$\vdash$	1				SPECIFY DATE	<u> </u>	(surcharge may apply)			REL	INQU	IISHEI	DBY:			DATE	201	8 – 3	- 28	RECE	IVED	BY:	DATE: 24	img.	-119
TUP	RN AROUND	REQUIRED:				···				ΗU	NGR	Y BAY	TALL	JKE		TIME	:	5:0	0 pm	6	ΛM		TIME: 6	2:15	
-				TINT			RF_			REL	INQU	ISHE	D BY:			DATE				RECE	IVED	BY:	DATE:		
3E								-						TIME		_					TIME:				
					RESULTS TO 2	50-423-4652 OI	R E-MAIL TO			FO	RLA	BU	SE O	NLY					~						
SP			wastewater(	@skifemie.com						Cooler Seal Intact? Sample Temperature: 2 °C Cooling Method?															
								Ves No N/A Frozen? Yes No Cepacks to No					_None												



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 05-APR-18 Report Date: 11-APR-18 16:04 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2076246 Project P.O. #: NOT SUBMITTED Job Reference: FARUC-SPRING 2018 EMS WK #4 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 04-APR-18 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	143	DLHC	75	mg/L		05-APR-18	R4007837
Total Suspended Solids	194	DLHC	10	mg/L		10-APR-18	R4008391
рН	8.16		0.10	pН		10-APR-18	R4008242
L2076246-2 WWTP EFFLUENT							
Sampled By: HB on 04-APR-18 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		09-APR-18	R4007177
Biochemical Oxygen Demand	<2.0		2.0	mg/L		05-APR-18	R4007837
Chemical Oxygen Demand	16		10	mg/L		10-APR-18	R4008025
Orthophosphate-Dissolved (as P)	0.184		0.010	mg/L		06-APR-18	R4005998
Coliform Bacteria - Fecal	<1		1	CFU/100mL		05-APR-18	R4006381
Phosphorus (P)-Total	0.207		0.020	mg/L	09-APR-18	10-APR-18	R4007717
l otal Suspended Solids	<3.0		3.0	mg/L		10-APR-18	R4008391
PH NO2 NO3 and Sum of NO2/NO3	8.06		0.10	рн		10-APR-18	R4008242
Noz, Nos and Sum of Noz/Nos							
Nitrate (as N)	34.4	DLHC	0.10	mg/L		06-APR-18	R4006388
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	34.5		0.11	mg/L		07-APR-18	
Nitrite in Water by IC		51110					
Nitrite (as N)	0.075	DLHC	0.050	mg/L		06-APR-18	R4006388
L2076246-3 ELKRIVER UPSTREAM							
Sampled By: HB on 04-APR-18 @ 14:30							
Matrix: WATER							
Ammonia, Total (as N)	-0.050		0.050	ma/l			P4007177
Arthonhosphate-Dissolved (as P)	<0.050		0.050	mg/L		09-AFR-18	R4007177
Coliform Bacteria - Fecal	<0.010		0.010	CEU/100ml		05-APR-18	R4005998
Phosphorus (P)-Total	<0.020		0 020	ma/l	09-APR-18	10-APR-18	R4007717
Total Suspended Solids	3.0		3.0	ma/l	00741110	10-APR-18	R4008391
pH	8.38		0.10	ng,=		10-APR-18	R4008242
NO2, NO3 and Sum of NO2/NO3			0110	F			
Nitrate in Water by IC							
Nitrate (as N)	2.20		0.020	mg/L		06-APR-18	R4006388
Nitrate+Nitrite	0.00		0.050				
Nitrate and Nitrite (as N)	2.20		0.050	mg/∟		07-APR-18	
Nitrite (as N)	<0.010		0.010	ma/L		06-APR-18	R4006388
				5			
Sampled By: HB on 04-APR-18 @ 14:45							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		09-APR-18	R4007177
Orthophosphate-Dissolved (as P)	0.182		0.010	mg/L		06-APR-18	R4005998
Coliform Bacteria - Fecal	5		1	CFU/100mL		05-APR-18	R4006381
Phosphorus (P)-Total	0.220		0.020	mg/L	09-APR-18	10-APR-18	R4007717
Total Suspended Solids	<3.0		3.0	mg/L		10-APR-18	R4008391

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 04-APR-18 @ 14:45							
Matrix: WATER							
рН	8.04		0.10	pН		10-APR-18	R4008242
NO2, NO3 and Sum of NO2/NO3							
Nitrate in water by IC Nitrate (as N)	34.6	DLHC	0.10	mg/L		06-APR-18	R4006388
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	34.6		0.11	mg/L		07-APR-18	
Nitrite (as N)	<0.050	DLHC	0.050	mg/L		06-APR-18	R4006388
L2076246-5 ELKRIVER DOWNSTREAM							
Sampled By: HB on 04-APR-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters Ammonia Total (as N)	~0.050		0.050	ma/l		09-APR-18	R4007177
Orthophosphate-Dissolved (as P)	<0.030		0.030	ma/L		06-APR-18	R4005998
Coliform Bacteria - Fecal	<1		1	CFU/100mL		05-APR-18	R4006381
Phosphorus (P)-Total	<0.020		0.020	mg/L	09-APR-18	10-APR-18	R4007717
Total Suspended Solids	3.0		3.0	mg/L		10-APR-18	R4008391
pH NO2_NO3 and Sum of NO2/NO3	8.40		0.10	рН		10-APR-18	R4008242
Nitrate in Water by IC							
Nitrate (as N)	2.27		0.020	mg/L		06-APR-18	R4006388
Nitrate+Nitrite	2.27		0.050	ma/l			
Nitrite in Water by IC	2.21		0.050	ing/L		07-4110-10	
Nitrite (as N)	<0.010		0.010	mg/L		06-APR-18	R4006388

#### Sample Parameter Qualifier Key:

Qualifier Descript	ion									
DLHC Detection	n Limit Raise	ed: Dilution required due to high concentration of	of test analyte(s).							
Test Method Reference	s:									
ALS Test Code	Matrix	Test Description	Method Reference**							
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode							
This analysis is carried out oxygen demand (BOD) are dissolved oxygen meter. D BOD (CBOD) is determine	using proce determined issolved BO d by adding	edures adapted from APHA Method 5210B - "B I by diluting and incubating a sample for a spec D (SOLUBLE) is determined by filtering the sa a nitrification inhibitor to the diluted sample prior	iochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a mple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.							
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry							
The Chemical Oxygen Der contain a premixed volume dichromate. The COD reag Oxidizable organic composi measured colormetrically a into the linear range.	The Chemical Oxygen Demand (COD) test is used to estimate the amount of organic matter in the water. The sample is added to COD tubes, which contain a premixed volume of reagents. The sample is then heated for two hours on the COD reactor with a strong oxidizing agent, potassium dichromate. The COD reagents also contain silver and mercury ions. Silver is used as a catalyst and mercury is used to complex chloride interference. Oxidizable organic compounds react, reducing the dichromate ion to green chromic ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is measured colormetrically and a decrease in absorbance at 420 nm is proportional to the COD. Samples with concentrations > 150 mg/L can be diluted into the linear range.									
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D							
This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level.										
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION							
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC							
This analysis is carried out of Chemistry, "Flow-injection al.	a, on sulfuric on analysis v	acid preserved samples, using procedures mo with fluorescence detection for the determination	dified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society n of trace levels of ammonium in seawater", Roslyn J. Waston et							
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)							
Inorganic anions are analy	zed by Ion C	Chromatography with conductivity and/or UV de	tection.							
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)							
Inorganic anions are analy	zed by Ion C	Chromatography with conductivity and/or UV de	tection.							
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS							
This analysis is carried out persulphate digestion of th	using proce e sample.	edures adapted from APHA Method 4500-P "Pt	hosphorus". Total Phosphorus is determined colourimetrically after							
PH-CL	Water	рН	APHA 4500 H-Electrode							
pH is determined in the lab hold time from time of sam	ooratory usin pling (field a	g a pH electrode. All samples analyzed by this analysis is recommended for pH where highly a	method for pH will have exceeded the 15 minute recommended ccurate results are needed)							
PO4-DO-COL-ED	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS							
This analysis is carried out colourimetrically on a sam	using proce ple that has	edures adapted from APHA Method 4500-P "Ph been lab or field filtered through a 0.45 micron	nosphorus". Dissolved Orthophosphate is determined membrane filter.							
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric							
This analysis is carried out (TSS) are determined by fi	using proce Itering a san	edures adapted from APHA Method 2540 "Solic nple through a glass fibre filter, and by drying th	ds". Solids are determined gravimetrically. Total suspended solids ne filter at 104 deg. C.							
** ALS test methods may in	corporate m	odifications from specified reference methods t	o improve performance.							
The last two letters of the a	above test co	ode(s) indicate the laboratory that performed a	nalytical analysis for that test. Refer to the list below:							

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

#### **Test Method References:**

ALS Test Code	Matrix	Test Description	Method Reference**
---------------	--------	------------------	--------------------

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

#### **ALS Environmental**

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-614 Average Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-80 Fort McMurray AB, Bay 1, 245 Macdonaid Cr, T9H 485, Tel: 780-791-1524 Fax 7 Edmonton AB, 9936 - 67th Avenue, TEE CP5, Tel: 780-413-5227 Toll Free; 1-800 Catgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free Seskatcon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-669-8370 Toll Free: 1-81



L2076246-COFC

SEN	D REPORT TO	<b>)</b> :			_			CHAIN OF	cus	то	DY	FO	RM									PAGE	<u>.</u>	ÔF	
CON	IPANY:	FERNIE AL	PINE RESORT	UTILITIES	CORPOR	RATION	ATTN:	PATRICK MAJER	AN	ALY	SIS F	REQI	JEST	ED:											<del>.</del>
ADD	RESS:	1505 - 17TH	Avenue South	East						Γ	[												1	1 L	L
СІТУ	/:	CALGARY		PROV:	ALBER	ГА	POSTAL CODE:	T2T 0E2														A	mp	out	
TEL:		1 - 800 - 25	8 - 7669	FAX:	403 - 24	4 - 3774	SAMPLER:	Hungry Baytaluke											i I				AN	<u>^</u> .	~ •
PRO	JECT NAME A	ND NO.:	FARUC-S	pring 2018	EMS wk	# 4	QUOTE NO:												1			6	) -	· [	or
PO	.:			ALS CC	ONTACT:	Lydmyla Shvets	@ALSGlobal.com	<del></del> د		]								i	łl			- I C	~	U	
REP	ORT FORMAT				┈┠╍╸ ┝╍╍	/ו/\ ש⊗	p naje <u>r@skirc</u>	<u>r.com</u>	oliforms														_		
┢╴	WO#					DATE / TIME	COLLECTED	MATRIX	ŭ T		1	e e	ЧЬ	Z-	z-	Z-N	8	۵				N	OTES (SF	- Imple sper	zfic
					YYYY-MM-DD	TIME	MAIRIA	<u> </u>	<u>ې</u>	E	ð	Тор Т	ΗN	Ŷ	Ŷ	B	8		$ \longrightarrow $	$\perp$	60	mments, d	ue dates, e	etc.)	
		WWTP Influ	ent Routine			201B - 4 - 4	14:00	Water		x	X									i – †		temp	<i>=∔£</i>	12	c
		WWTP Influ	ent BOD		2	2018 - 4 - 4	14:00	Water								_	х			$\square$		temp	<u>=10</u>	•7	C
																				$\vdash$					
		WWTP Eff	uent Routine		3	2018 - 4 - 4	14:15	Water		X	X		_				<u> </u>	X		$\vdash$		temp	×		<u> </u>
i i		WWTP Eff	uent BOD		4	2018 - 4 - 4	14:15	Water			ļ	-					X			$\vdash$		temp	<u>=  </u>	14	<u> </u>
		WWTP Eff	uent Nutrient		5	2018 - 4 - 4	14:15	Water				X	х	X	х	×	ļ			$\vdash$	$\rightarrow$	temp	<u>-</u> /-	Ц	<u> </u>
	-	WWTP Eff	uent Bacti		6	2018 - 4 - 4	14:15	Water	X											┝──╋		temp	<u>=  /</u>	· / /	C
12														L.						$\vdash$					
S		Elkriver Up:	stram Routine		H.	2018 – 4 – 4	14:30	Water		X	×									<b> </b>	$ \rightarrow $	temp	= 7	, 	C
К		Elkriver Up:	stream Nutrient		8	2018 - 4 - 4	14:30	Water		 		×	X	X	×	×				$\vdash$	$\rightarrow$	temp	<u> </u>	Ľ	С
ÅB		Elkriver Up:	stream Bacti		9	2018 – 4 – 4	14:30	Water	×	1		<u> </u>		<b>.</b>						$\square$	$\rightarrow$	temp	= /	$\mathcal{L}$	C
L L											<u> </u>	<u> </u>								- 1	$\rightarrow$				
L 문		Elkriver Ou	tfall Routine		10	2018 - 4 - 4	14:45	Water		X	X	<u> </u>	<b>_</b>			<u> </u>			$\square$	$\square$		temp		$\vdash \downarrow$	C
		Elkriver O	utfall Nutrient		<u>'//</u>	2018 - 4 - 4	14:45	Water				×	Х	X	X	X				$\square$	$\rightarrow$	temp	<u>- 4</u>	-1-	<u> </u>
		Elkriver Ou	tfell Bacti		12	2018 - 4 - 4	14:45	Water	<u>×</u>						<u> </u>		<u> </u>	ļ		$\square$		temp	<u> </u>	$\underline{\psi}$	<u> </u>
								ļ		<u> </u>		<u> </u>				ļ				$\vdash$				<u>-</u>	
		Elkriver dov	wnstream Routin	10	15	2018 - 4 - 4	15:00	Water		X	X				<b></b>	<u> </u>	<b> </b>					temp	· =	<u>~</u> _{	<u>, c</u>
		Elkriver dov	wnstream Nutrie	nt /	4	2018 - 4 - 4	15:00	Water				X	X	X	<u>×</u>	×	ļ					temp	<u>'</u> =	$\perp X$	<u></u>
		Elkriver do	wnstream Bacti		15	2018 - 4 - 4	15:00	Water	×									ļ				temp	<u>' = U</u>	120	<u>с</u>
								<u> </u>							<u> </u>						┉			1 1	
-			• K	( ¢	R	SPECIFY DATE		(surcharge May apply)			REL	INQU	ISHEC	BY:		<sup>[</sup>	DATE	20	18 – 4	-4	RECEI	NED BY:	DATE	5/1	$p_{i}$
Ľ			<u> </u>	- 1		<b></b>	<b>.</b>				HU	NGR	( BAY	TALL	IKE	<u> </u>	TIME:		5:0	.0 pm		MM	TIME	9.0	<u>75</u>
SE	ND INVOICE T	0:		ĻΓ	Þ	<b>ار</b>		ĸF			REL	INQU	ISHED	BY:		<u> </u>	DATE:	_	<u></u>		RECE	VED BY:	DATE	<u></u>	·
INV		Т:		<u> </u>			ľ								arv		TIME:			لميد			TIME	:1	
SPE	ECIAL INSTRU	ICTIONS:	PLEASE FAX	A COPY C skifemie.co	OF THE P m	ESULTS TO 25	0-423-4652 OR	E-MAIL TO			FO		B US		AL Y	Sam				<del>S</del> ;		Cooling Mr		<u>_</u>	<u> </u>
1											~	Yes	No		N/A	Froz	en?	Ye	sV	 No			uslo	eN	one



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 12-APR-18 Report Date: 19-APR-18 14:37 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2079242 Project P.O. #: NOT SUBMITTED Job Reference: FARUC-SPRING 2018 EMS WK #5 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HUNGRY BAYTALLIKE on 11-APR-18 (	ଇ 14∙∩∩						
Matrix: Water	3 14.00						
Miscellaneous Parameters							
Biochemical Oxygen Demand	37	BODP	20	mg/L		12-APR-18	R4016108
Total Suspended Solids	66.3		3.0	mg/L		16-APR-18	R4015866
рН	7.97		0.10	pН		18-APR-18	R4017285
L2079242-2 WWTP EFFLUENT							
Sampled By: HUNGRY BAYTALUKE on 11-APR-18	@ 14:15						
Matrix: Water							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		13-APR-18	R4014117
Biochemical Oxygen Demand	<2.0		2.0	mg/L		12-APR-18	R4016108
Chemical Oxygen Demand	<10		10	mg/L		17-APR-18	R4016385
Orthophosphate-Dissolved (as P)	0.205		0.010	mg/L		13-APR-18	R4010289
Coliform Bacteria - Fecal	1		1	CFU/100mL		12-APR-18	R4011171
Phosphorus (P)-Total	0.223		0.020	mg/L	16-APR-18	17-APR-18	R4015970
Total Suspended Solids	<3.0		3.0	mg/L		16-APR-18	R4015866
pH	8.08		0.10	pН		18-APR-18	R4017285
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	25.3	DI HC	0.10	ma/l		12-APR-18	R4010335
Nitrate+Nitrite	20.0	DEITO	0.10	iiig/ L			114010333
Nitrate and Nitrite (as N)	25.3		0.11	mg/L		13-APR-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLHC	0.050	mg/L		12-APR-18	R4010335
L2079242-3 ELKRIVER UPSTREAM							
Sampled By: HUNGRY BAYTALUKE on 11-APR-18	@ 14:30						
Matrix: Water							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		13-APR-18	R4014117
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		13-APR-18	R4010289
Coliform Bacteria - Fecal	11		1	CFU/100mL		12-APR-18	R4011171
Phosphorus (P)-Total	<0.020		0.020	mg/L	16-APR-18	17-APR-18	R4015970
Total Suspended Solids	7.7		3.0	mg/L		16-APR-18	R4015866
pH	8.37		0.10	рН		18-APR-18	R4017285
NUZ, NUS and Sum of NUZ/NUS							
Nitrate (as N)	1.73		0.020	ma/L		12-APR-18	R4010335
Nitrate+Nitrite				3-			
Nitrate and Nitrite (as N)	1.73		0.050	mg/L		13-APR-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		12-APR-18	R4010335
L2079242-4 ELKRIVER OUTFALL							
Sampled By: HUNGRY BAYTALUKE on 11-APR-18	@ 14:45						
Matrix: Water							
Miscellaneous Parameters						10 100 10	
Ammonia, I otal (as N)	<0.050		0.050	mg/L		13-APR-18	R4014117
Orthophosphate-Dissolved (as P)	0.010		0.010	mg/L		13-APR-18	R4010289
Conform Bacteria - Fecal	3		1	CFU/100mL		12-APR-18	K4U11171
Hosphorus (H)-100al	0.023		0.020	mg/L	10-APK-18	17-APK-18	K4015970
Total Suspended Solids	11.0		3.0	ing/L		10-APK-10	R4013800

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HUNGRY BAYTALUKE on 11-APR-18 @	14:45						
Matrix: Water							
рН	8.22		0.10	рН		18-APR-18	R4017285
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	0.232		0.020	ma/L		12-APR-18	R4010335
Nitrate+Nitrite	0.202		01020				
Nitrate and Nitrite (as N)	0.232		0.050	mg/L		13-APR-18	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		12-APR-18	R4010335
L2079242-5 ELKRIVER DOWNSTREAM							
Sampled By: HUNGRY BAYTALUKE on 11-APR-18 @	15:00						
Matrix: Water							
Miscellaneous Parameters	0.050		0.050				DADAAAT
Antimonia, rotal (dS N) Arthonhosphate_Dissolved (as D)	<0.050		0.050	mg/L		13-APK-18	R4014117
Coliform Bacteria - Fecal	22		1	CFU/100ml		12-APR-18	R4010269
Phosphorus (P)-Total	<0.020		0.020	ma/L	16-APR-18	17-APR-18	R4015970
Total Suspended Solids	9.0		3.0	ma/L		16-APR-18	R4015866
pH	8.34		0.10	рН		18-APR-18	R4017285
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.87		0.020	mg/L		12-APR-18	R4010335
Nitrate and Nitrite (as N)	1.87		0.050	mg/L		13-APR-18	
Nitrite in Water by IC	0.010		0.010				D 4040005
	<0.010		0.010	mg/∟		12-APR-18	R4010335

### Sample Parameter Qualifier Key:

Qualifier	Description								
BODP	BOD dilution results d	iffered by more than 30% RPD. Precision	n of reported BOD result may be less than usual.						
DLHC	Detection Limit Raised	d: Dilution required due to high concentra	tion of test analyte(s).						
RRQC	Refer to report remark	s for information regarding this QC result							
Test Method R	eferences:								
ALS Test Code	Matrix	Test Description	Method Reference**						
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode						
This analysis is o oxygen demand dissolved oxyger BOD (CBOD) is	carried out using proced (BOD) are determined n meter. Dissolved BOE determined by adding a	dures adapted from APHA Method 5210B by diluting and incubating a sample for a 0 (SOLUBLE) is determined by filtering th a nitrification inhibitor to the diluted sampl	<ul> <li>"Biochemical Oxygen Demand (BOD)". All forms of biochemical specified time period, and measuring the oxygen depletion using a e sample through a glass fibre filter prior to dilution. Carbonaceous e prior to incubation.</li> </ul>						
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry						
The Chemical O: contain a premix dichromate. The Oxidizable organ measured colorn into the linear rat	The Chemical Oxygen Demand (COD) test is used to estimate the amount of organic matter in the water. The sample is added to COD tubes, which contain a premixed volume of reagents. The sample is then heated for two hours on the COD reactor with a strong oxidizing agent, potassium dichromate. The COD reagents also contain silver and mercury ions. Silver is used as a catalyst and mercury is used to complex chloride interference. Oxidizable organic compounds react, reducing the dichromate ion to green chromic ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is measured colormetrically and a decrease in absorbance at 420 nm is proportional to the COD. Samples with concentrations > 150 mg/L can be diluted into the linear range.								
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D						
This analysis is of Coliform bacteria involves an initia bacteria (Fecal)	carried out using proced a is enumerated by cult I 24 hour incubation at and is used for non-turk	dures adapted from APHA Method 9222 " uring and colony counting. A known samp 44.5 degrees C of the filter with the appro pid water with a low background bacteria	Membrane Filter Technique for Members of the Coliform Group". Devolume is filtered through a 0.45 micron membrane filter. The test opriate growth medium. This method is specific for thermotolerant level.						
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION						
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC						
This analysis is o of Chemistry, "Fl al.	carried out, on sulfuric a ow-injection analysis w	acid preserved samples, using procedure ith fluorescence detection for the determi	s modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society nation of trace levels of ammonium in seawater", Roslyn J. Waston et						
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)						
Inorganic anions	are analyzed by Ion Cl	nromatography with conductivity and/or U	V detection.						
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)						
Inorganic anions	are analyzed by Ion Cl	nromatography with conductivity and/or U	V detection.						
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS						
This analysis is o persulphate dige	carried out using proced stion of the sample.	dures adapted from APHA Method 4500-F	P "Phosphorus". Total Phosphorus is determined colourimetrically after						
PH-CL	Water	рН	APHA 4500 H-Electrode						
pH is determined hold time from til	l in the laboratory using me of sampling (field ar	a pH electrode. All samples analyzed by nalysis is recommended for pH where hig	this method for pH will have exceeded the 15 minute recommended hly accurate results are needed)						
PO4-DO-COL-EI	D Water	Diss. Orthophosphate in Water by Colo	ur APHA 4500-P PHOSPHORUS						
This analysis is o colourimetrically	carried out using procee on a sample that has b	dures adapted from APHA Method 4500-F een lab or field filtered through a 0.45 mi	P "Phosphorus". Dissolved Orthophosphate is determined cron membrane filter.						
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric						
This analysis is o (TSS) are detern	carried out using proced nined by filtering a sam	dures adapted from APHA Method 2540 " ple through a glass fibre filter, and by dry	Solids". Solids are determined gravimetrically. Total suspended solids ing the filter at 104 deg. C.						
** ALS test metho	ds may incorporate mo	difications from specified reference meth	ods to improve performance.						

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

#### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**				
Chain of Custody Numbers:							

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

#### **ALS Environmental**

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, V Fort St. John BC, Box 256, 9831 - 98A Grand Prairie AB, 9595 - 111 Street, Th Fort McMurray AB, Bay 1, 245 Macdon Edmonton AB, 9936 - 67th Avenue, T6 Calgary AB, Bay 7, 1313 - 44th Avenue Saskatoon SK, 819 - 58th Street East, .



1-0298 83

1

SENC	REPORT	0:						CHAIN OF C	CUS	TO	DY	FO	RM_								P	'AGE	OF	
сом	PANY:	FERNIE ALPII	NE RESORT (	JTILITIES (	CORPOR	RATION	ATTN:		AN/	ALYS	IS R	EQU	ESTI	ED:								- <b>I</b>		· 
ADD	RESS:	1505 - 17TH A	venue South	East																		Ask	2°~ 1	F
CITY	:	CALGARY		PROV:	ALBER		POSTAL CODE:	T2T 0E2			1											pur	new.	15
TEL:		1 - 800 - 258	- 7669	FAX:	403 - 24	4 - 3774	SAMPLER:	Hungry Baytaluke														and	- F	5
PRO.		AND NO.:	ARUC-Sp	oring 2018 E	EMS wk	#5	QUOTE NO:										ł				1			
	10.:			ALS CO	NTACT:	Lydmyla Shvets	@ALSGlobal.com	n																
REP	ORT FORMA	T:		، مر ا ا ت		/ ۱/۱ - س∝		<u>r.com</u>	oliforms														<u> </u>	
	WO#					OATE / TIME	COLLECTED	MATRIX	Ŭ R	6		머니	P P	z e	Z S	N-0				1		NOTES (s	ample spe	cific
		SA		CATION		YYYY-MM-DD	TIME		лес С	ΤSS	F	ē	<u>1</u>	ž	ĝ	2 2	8 8			$\square$		comments, c	JUe dates, i	81C.)
		WWTP Influe	nt Routine		1	2018 <b>- 4 - 11</b>	14:00	Water .	<u> </u>	X	х						_	_		┢━━╋	t	.emp =	L-U	C
	١	WWTP Influe	nt BOD		2	2018 – 4 – 11	14:00	Water								,				$\vdash$	t	:emp = 1	· [	
									<b> </b>									<u> </u>						
	5	WWTP Efflue	ent Routine		3	2018 – 4 – 11	14:15	Water		X	х						<u> </u>				t	lemp =	1-7	
I		WWTP Efflue	nt BOD		- 44	2018 – 4 – 11	14:15	Water								,			$\square$	$\vdash$	<u>1</u>	uemp=	$\mapsto$	
		WWTP Efflue	nt Nutrient		5	2018 – 4 – 11	14:15	Water				X	X	<u>×</u>	×	<u>×</u>	4		<u> </u> '	┝──┥	t	.emp =	<u>  _</u>	
		WWTP Efflue	nt Bacti		<u>_</u>	2018 - 4 - 11	14:15	Water						<u> </u>			_		<u> </u>	┢╼╍╌┤		iemp ≠		
Ľ							·	·											–∣	-+	<b>⊢_</b>			
ő	7	Elkriver Upstr	am Routine		<u>+</u>	2018 – 4 – 11	14:30	Water	<b>_</b>	X	X						+-	_	+	┨━━─┤		temp =	-#	, <u> </u>
USE		Elkriver Upstr	eam Nutrient		8	2018 - 4 - 11	14:30	Water	<u> </u>			X	_ <u>×</u>	<u>×</u>	×	<u>^</u>	+				<u> </u>			
ÅΒ		Elkriver Upstr	ream Bacti		9	2018 - 4 - 11	14:30	Water	×					_					╀	$\left  \right $	┟╌╼╉	temp - 0		
ЪR Г					10														┼	┝──┤	┝──╂	temp =	7	
Ĕ	1	Elkriver Outfa	all Routine		10	2018 - 4 - 11	14:45	Water	1	×	×			v	~		-		┼──	┢──┤	┝──╋	temp -	+- †	<u> </u>
	<u> </u>	Elkriver Out	fall Nutrient		11	2018 - 4 - 11	14:45	Water				<u> </u>	~	<u>^</u>	_	^	+		╂──	┼──┤	H	temp =	と	$-\frac{1}{c}$
	<u> </u>	Elkriver Outfa	all Bacti		12	2018 - 4 - 11	14:45	Water	<u> ^</u>										+	┨──┤			<u> </u>	
					12			18/16-1	╉──								_		+	$\left  \right $	$\left  \right $	temp = 📕	1-2	<u>1 c</u>
		Elkriver dowr	stream Routin	ne	<u></u>	2018 - 4 - 11	15:00	· vvater		$\uparrow$	<u> </u>		-		y	x	+-		┿──	$\left  \right $		temp = /		₽÷
		Elkriver dowr	istream Nutrie	nt	14	2018 - 4 - 11	15:00	Water	┼┯		-	<u> </u>	<u>^</u>	<u> </u>				+	+	+		temp = /	$\frac{1}{1}$	
	<b></b>	Elkriver down	nstream Bacti		15	2018 - 4 - 11	15:00	vvaler	<u> </u>									+	+	++			<u>_v</u>	100
<u> </u>				1			<u> </u>			1	051						· =· 20	)18 - 4	   _ 11	RECI			<sub>€</sub> ाम	tiz-
TUF		REQUIRED:	• K	9	R	SPECIFY DATE:		(surcharge may apply)			HUN	IGRY	BAY	TALU	KE			5:	00 pm	1	16		E 0	2h
		TO:		71 1	⊢∎−			RF		_	REL	INOU	SHED	BY			E:			RECI	EIVED	BY: DAT	 E::	<u></u>
OE!		NT:		<b>7</b> '	7 L		<b>`</b>									TIA				$\top$			E:	
SPC	CILL INSTR	HCTIONS:		A COPY C		RESULTS TO 25	0-423-4652 OR	E-MAIL TO			FO	RLA	B US	E ON	<b>ILY</b>	L	<u> </u>		7	<u> </u>				
J. L			wastewater@	skifemie.co	om 🛛						Cool	ler Sea	al Inter	ct?		Semple	Temp	erature:	7	°C	Coolir	ng Method?		
											1 5	100	No		J/Δ	Erozeo'	, <b>,</b>	'es	Ńn		I Io	repacks	.ce N	-lone



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:19-APR-18Report Date:24-APR-18 17:28 (MT)Version:FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2082258 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - SPRING 2018 EMS WK #6 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

FARUC - SPRING 2018 EMS WK #6

L2082258 CONTD.... PAGE 2 of 5 Version: FINAL

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: Hungry Baytaluke on 18-APR-18 @ 14:00	)						
Matrix: Water							
Miscellaneous Parameters							
Biochemical Oxygen Demand	28.9	DLHC	6.0	mg/L		19-APR-18	R4022290
Total Suspended Solids	45.3		3.0	mg/L		23-APR-18	R4022078
рН	8.17		0.10	pН		23-APR-18	R4021864
L2082258-2 WWTP EFFLUENT							
Sampled By: Hungry Baytaluke on 18-APR-18 @ 14:15	5						
Matrix: Water							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		23-APR-18	R4021168
Biochemical Oxygen Demand	<2.0		2.0	mg/L		19-APR-18	R4022290
Chemical Oxygen Demand	<10		10	mg/L		23-APR-18	R4021818
Orthophosphate-Dissolved (as P)	0.220		0.010	mg/L		20-APR-18	R4018218
Coliform Bacteria - Fecal	17		1	CFU/100mL		19-APR-18	R4018303
Phosphorus (P)-Total	0.248		0.020	mg/L	23-APR-18	24-APR-18	R4022111
Total Suspended Solids	<3.0		3.0	mg/L		23-APR-18	R4022078
pH	8.27		0.10	рН		23-APR-18	R4021864
Noz, NOS and Sum of NOZ/NOS							
Nitrate in Water by iC	11.4		0.020	ma/L		19-APR-18	R4018067
Nitrate+Nitrite				5			
Nitrate and Nitrite (as N)	11.4		0.050	mg/L		20-APR-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		19-APR-18	R4018067
L2082258-3 ELKRIVER UPSTREAM							
Sampled By: Hungry Baytaluke on 18-APR-18 @ 14:30	)						
Matrix: Water							
Miscellaneous Parameters							<b>D</b> / 00 / / 00
Ammonia, Total (as N)	<0.050		0.050	mg/L		23-APR-18	R4021168
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		20-APR-18	R4018218
Comorni Bacteria - Fecal	1		1	CFU/100mL		19-APR-18	R4018303
Total Supported Solida	<0.020		0.020	mg/∟	23-APR-18	24-APR-18	R4022111
	5.3		3.0	nig/L		23-AFR-10	R4022076
NO2. NO3 and Sum of NO2/NO3	0.30		0.10	μΠ		20-AF K-10	1,4021004
Nitrate in Water by IC							
Nitrate (as N)	1.57		0.020	mg/L		19-APR-18	R4018067
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.57		0.050	mg/L		20-APR-18	
Nitrite in Water by IC	-0.010		0.010	ma/l			D4019067
	<0.010		0.010	ing/∟		19-AFK-10	K4010007
L2U02230-4 ELKKIVEK UUTFALL							
Sampleu by. Hungry baytaluke on 18-APK-18 @ 14:4t	)						
Miscellaneous Parameters							
Ammonia. Total (as N)	<0.050		0.050	ma/l		23-APR-18	R4021168
Orthophosphate-Dissolved (as P)	0.013		0.010	ma/l		20-APR-18	R4018218
Coliform Bacteria - Fecal	30		1	CFU/100ml		19-APR-18	R4018303
Phosphorus (P)-Total	0.022		0.020	ma/L	23-APR-18	24-APR-18	R4022111
Total Suspended Solids	6.7		3.0	ma/L		23-APR-18	R4022078
	-			Ŭ		-	

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2U02200-4 ELNKIVEK OUTFALL Sampled By: Hungry Baytaluke on 18-APR-18 @ 14-44	5						
Matrix: Water	•						
pH	8.28		0.10	рН		23-APR-18	R4021864
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	0.400		0.000				D 4040007
Nitrate (as N)	0.199		0.020	mg/∟		19-APR-18	R4018067
Nitrate and Nitrite (as N)	0.199		0.050	mg/L		20-APR-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		19-APR-18	R4018067
L2082258-5 ELKRIVER DOWNSTREAM							
Sampled By: Hungry Baytaluke on 18-APR-18 @ 15:00	)						
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		23-APR-18	R4021168
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		20-APR-18	R4018218
Coliform Bacteria - Fecal	2		1	CFU/100mL		19-APR-18	R4018303
Phosphorus (P)-Total	<0.020		0.020	mg/L	23-APR-18	24-APR-18	R4022111
Total Suspended Solids	7.3		3.0	mg/L		23-APR-18	R4022078
p⊓ NO2_NO3 and Sum of NO2/NO3	8.38		0.10	рн		23-APR-18	R4021864
Nitrate in Water by IC							
Nitrate (as N)	1.73		0.020	mg/L		19-APR-18	R4018067
Nitrate+Nitrite	1 70		0.050	mg/l			
Nitrite in Water by IC	1.73		0.050	ing/∟		20-AFK-10	
Nitrite (as N)	<0.010		0.010	mg/L		19-APR-18	R4018067

#### Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Raised	: Dilution required due to high concentration of	of test analyte(s).
Test Method Re	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand ( dissolved oxygen BOD (CBOD) is o	arried out using proced (BOD) are determined I meter. Dissolved BOD determined by adding a	lures adapted from APHA Method 5210B - "Bi by diluting and incubating a sample for a spec 0 (SOLUBLE) is determined by filtering the sar nitrification inhibitor to the diluted sample price	ochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a nple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
The Chemical Ox contain a premixe dichromate. The Oxidizable organ measured colorm into the linear ran	eygen Demand (COD) t ed volume of reagents. COD reagents also cor ic compounds react, re tetrically and a decreas tige.	est is used to estimate the amount of organic The sample is then heated for two hours on th ntain silver and mercury ions. Silver is used as ducing the dichromate ion to green chromic io the in absorbance at 420 nm is proportional to t	matter in the water. The sample is added to COD tubes, which ne COD reactor with a strong oxidizing agent, potassium a catalyst and mercury is used to complex chloride interference. n. For samples in the 10 - 150 mg/L range the remaining Cr6+ is he COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is c Coliform bacteria involves an initial bacteria (Fecal) a	arried out using proced is enumerated by cultu 24 hour incubation at 4 and is used for non-turb	lures adapted from APHA Method 9222 "Mem uring and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriat id water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". Jume is filtered through a 0.45 micron membrane filter. The test e growth medium. This method is specific for thermotolerant
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is c of Chemistry, "Flo al.	arried out, on sulfuric a ow-injection analysis w	cid preserved samples, using procedures mo th fluorescence detection for the determinatio	dified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society n of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by lon Ch	romatography with conductivity and/or UV de	tection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by lon Ch	rromatography with conductivity and/or UV de	tection.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c persulphate diges	arried out using proced stion of the sample.	lures adapted from APHA Method 4500-P "Ph	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determined hold time from tir	in the laboratory using ne of sampling (field ar	a pH electrode. All samples analyzed by this alysis is recommended for pH where highly a	method for pH will have exceeded the 15 minute recommended ccurate results are needed)
PO4-DO-COL-ED	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c colourimetrically	arried out using procec on a sample that has b	lures adapted from APHA Method 4500-P "Ph een lab or field filtered through a 0.45 micron	osphorus". Dissolved Orthophosphate is determined membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is c (TSS) are determ	arried out using proced ined by filtering a sam	lures adapted from APHA Method 2540 "Solid ble through a glass fibre filter, and by drying th	ls". Solids are determined gravimetrically. Total suspended solids the filter at 104 deg. C.
** ALS test method	ds may incorporate mo	difications from specified reference methods to	o improve performance.
The last two lette	rs of the above test co	de(s) indicate the laboratory that performed ar	alytical analysis for that test. Refer to the list below:

 Laboratory Definition Code
 Laboratory Location

 ED
 ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA

 CL
 ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

#### **Test Method References:**

ALS Test Code	Matrix	Test Description	Method Reference**
---------------	--------	------------------	--------------------

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

#### **ALS Environmental**

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-41P1 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel:: Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-51 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 78 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-522 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-3 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-E



.....

· -

L2082258-COFC

SEN	D REPORT 1	TO:					CHAIN OF	CUS	то	DY	Fυ	<b>IKIV</b>	r								PAGE	1	OF	
CON	IPANY:	FERNIE AL	PINE RESORT	UTILITIES CORPO	DRATION	ATTN	PATRICK MAJER	AN		SIS F	REQI	JEST	ED:											
ADD	RESS:	1505 - 17TI	Avenue South	East															T		١.			
сіту	/: 	CALGARY		PROV. ALBE	RTA	POSTAL CODE:	T2T 0E2																	
TEL:		1 - 800 - 25	58 - 7669	FAX: 403 - 1	244 - 3774	SAMPLER	Hungry Baytaluke									1								
PRO	JECT NAME	AND NO.:	FARUC-S	pring 2018 EMS w	k#6	QUOTE NO:																		
109	NO.:			ALS CONTACT	Lydmyla Shvets	@ALSGlobal.co	m												ĺ					
REP	ORT FORMA	AT:		┫ <mark>┟</mark> 図┣ <u>□┣━</u>	-N/I/ 		<u>x,com</u>	oliforms																
	WO#				DATE / TIME	COLLECTED	MATRIX		l o		Ho F	<u></u>	3-N	N-0	2-N	ů Ö	o				NO	TES (sam	ple specific	
L.				<b>4</b>	YYYY-MM-DD	TIME		<u> </u>	13	F	5	1 <sup>1</sup>	Ξ	ž	2	B	8							_
		WWTP Infl	uent Routine	<del>_</del>	2018 - 4 - 18	14:00	Water		×	×	[										temp =		<u></u>	의
	<u> </u>	WWTP Infl	uent BOD	2	2018 - 4 - 18	14:00	Water		-							×					temp =	=		4
		<u> </u>			·	ļ		_	<u> </u>	1		ļ								_	<u> </u>			
ł	-7-	WWTP Eff	uent Routine	<u>Ş</u>	2018 - 4 - 18	14:15	Water	4	. ×	<u>×</u> _							×				temp =	-		4
		WWTP Eff	uent BOD	4	2018 - 4 - 18	14:15	Water		<u> </u>	<u> </u>						×		_		<u> </u>	temp =	=		1
	A-	WWTP Eff	uent Nutrient	5	2018 - 4 - 18	14:15	Water		┼_	<b> </b>	<u>×</u>	×	×	×	X					——	temp =			
		WWTP Effi	uent Bacti	_ 6	2018 - 4 - 18	14:15	Water	_  ×			<u> </u>	<u> </u>	[		<u> </u>		_				temp =	=		4
Σ				<u> </u>		44.00			╞	Ļ		<u> </u>								+			<u></u>	
Ю Ш	-2	Elkriver Ups	stream Routine	·	2018 - 4 - 18	14:30	vvater		<u> </u>	<u>  ^</u>	+	-	<b>.</b>	~	-				+	+	tame :	- 		$\exists$
S	$\vdash \smile$	Elkriver Up:	stream Nutnent	<u> </u>	2018 - 4 - 18	14:30	vvater				<u> </u>	<u> </u> ^	<u> </u> ^	<u>^</u>	<u>^</u>			-+			temp			1
ß		Elkriver Up:	stream Bact	7	2018 - 4 - 16	14:30	vva(er	-+-			<u> </u>	<u> </u>												-
SR 1		Ellucium Cur		10	2018 - 4 - 19	14:45	Water		×	×	-				-				-+-	<del></del>	temp :			
l <sup>LL</sup>	┠╶┟╶┟	Eikniver Ou			2010 - 4 - 10	14:45	Water		+^	Ê	×	×	x	x	x						temp :			
1	┝╺┶┦	Elknver O	uttall Nutrient	[/ _/#	2010 - 4 - 10	14:45	Water	+	-	┼─-	<u> </u> ^-	Ê	<u> </u> ^_	<u> </u>	Â						temo	 =		
1	<u>⊢</u>	Eikniver Ou	(14)  Dacii 	IV	2010 - 4 - 18		YValci	- <u> </u> ^		+										+	+	-		-
1		Elkriver do	wostream Routin	18 12	2018 - 4 - 18	15:00	Water	-	x	x			-							-	temp	 =		5
1	+ -	Elkriver do	wostream Nutrie	nt IU	2018 - 4 - 18	15:00	Water	+-			x	x	x	x	x					+	temp			5
	$\vdash \checkmark$	Elkriver do	vostream Bacti	····	2018 - 4 - 18	15:00	Water	- x	1-		-	-								+	temp			5
										· · · ·	-	<b></b>		-		·	-				<u> </u>			
TUP		REQUIRED:	•R		SPECIFY DATE:		(surcharge may apply)		,	REL		SHEC	BY:	IKE			2018	- 4 -	18 <u>R</u> E	ECEIVE	D BY:	DATE:		
		<u></u>		7 <b>7</b> 167																- CEIGE	 ∂dv∌		ratio	₼
		ΔT·		<b>ም ጜ</b> ዚ		┎── ┎── ┣				<u>Rel</u>		IGHEL								J	$\mathbb{K}$	TIME.	-46-	北
SPE		UCTIONS	PLEASE FAX	A COPY OF THE	RESULTS TO 25	0-423-4652 OR	E-MAIL TO			FO	RLA	B US	EOI	NLY		INC:			<u>,                                    </u>	4	47	( INVIE:	<u> </u>	Ψ
. 			wastewater@	skifemie.com						Coo	ler Se	al Inta	ct?		Sam	ole Te	mpera	ure: _	<u>O</u> c	Coc	ling Meth	nod?		
											Yes _	No		A/A	Froz	an? _	<b>∠</b> Yes	N	,		Icepacks	ice	None	



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 06-DEC-18 Report Date: 19-DEC-18 13:46 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2206878 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - FALL 2018 EMS WK #1 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

FARUC - FALL 2018 EMS WK #1

L2206878 CONTD.... PAGE 2 of 5 Version: FINAL

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 05-DEC-18 @ 14:00							
Matrix: WATER							
Maurix. WATER Miscellaneous Parameters							
Biochemical Oxygen Demand	42	DLHC	20	ma/L		07-DEC-18	R4392847
Total Suspended Solids	66.7		3.0	mg/L		11-DEC-18	R4393639
pH	7.89		0.10	pH		10-DEC-18	R4389590
12206878-2 WWTP EEELUENT							
Sampled By: HB on 05-DEC-18 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		13-DEC-18	R4393652
Biochemical Oxygen Demand	<2.0		2.0	mg/L		07-DEC-18	R4392847
Chemical Oxygen Demand	<10		10	mg/L		10-DEC-18	R4389749
Orthophosphate-Dissolved (as P)	0.132	HTD	0.050	mg/L		09-DEC-18	R4384278
Coliform Bacteria - Fecal	<1		1	CFU/100mL		06-DEC-18	R4382187
Nitrate (as N)	21.4		0.020	mg/L		07-DEC-18	R4388287
Nitrate and Nitrite (as N)	21.4		0.050	mg/L		11-DEC-18	
Nitrite (as N)	0.021		0.010	mg/L		07-DEC-18	R4388287
Phosphorus (P)-Total	<0.0050	RRV	0.0050	mg/L		18-DEC-18	R4400354
Total Suspended Solids	<3.0		3.0	mg/L		11-DEC-18	R4393639
рН	8.22		0.10	рН		10-DEC-18	R4389590
L2206878-3 ELKRIVER UPSTREAM							
Sampled By: HB on 05-DEC-18 @ 14:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		13-DEC-18	R4393652
Orthophosphate-Dissolved (as P)	0.0111	HTD	0.0050	mg/L		09-DEC-18	R4384278
Coliform Bacteria - Fecal	<1		1	CFU/100mL		06-DEC-18	R4382187
Nitrate (as N)	1.68		0.020	mg/L		07-DEC-18	R4388287
Nitrate and Nitrite (as N)	1.68		0.050	mg/L		11-DEC-18	
Nitrite (as N)	<0.010		0.010	mg/L		07-DEC-18	R4388287
Phosphorus (P)-Total	<0.0050	RRV	0.0050	mg/L		18-DEC-18	R4400354
Total Suspended Solids	<3.0		3.0	mg/L		11-DEC-18	R4393639
рН 	8.44		0.10	рН		10-DEC-18	R4389590
L2206878-4 ELKRIVER OUTFALL							
Sampled By: HB on 05-DEC-18 @ 14:45							
Matrix: WATER							
Miscellaneous Parameters	0.050		0.050				D 4000050
Ammonia, Total (as N) Orthophosphato Dissolved (as P)	<0.050	нтр	0.050	mg/L		13-DEC-16	R4393052
Coliform Bactoria – Eccal	0.0370		0.0050	CELI/100ml		09-DEC-18	R4304270
Nitrate (as N)	5 2.52		0.020	ma/l		07 DEC 18	R4302107
Nitrate and Nitrite (as N)	2.52		0.020	mg/L		11-DEC-18	14300207
Nitrite (as N)	<0.02		0.030	ma/l		07-DEC-18	R4388287
Phosphorus (P)-Total		RRV	0.010	ma/l		18-DEC-18	R4400354
Total Suspended Solids	<0.0000 <2 0		3.0000	ma/l		11-DEC-18	R4393639
pH	8.34		0.10	nH		10-DFC-18	R4389590
	0.07		0.10	P''		10 0 2 0 10	
Sampled By: HB on 05-DEC-18 @ 15:00							
Matrix WATED							

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2206878-5 ELKRIVER DOWNSTREAM Sampled By: HB on 05-DEC-18 @ 15:00 Matrix: WATER Miscellaneous Parameters Ammonia, Total (as N) Orthophosphate-Dissolved (as P) Coliform Bacteria - Fecal Nitrate (as N) Nitrate and Nitrite (as N) Nitrite (as N) Phosphorus (P)-Total Total Suspended Solids	<0.050 0.0099 <1 1.66 1.66 <0.010 <0.0050 4.0 8.43	HTD	0.050 0.0050 1 0.020 0.050 0.010 0.0050 3.0 0.10	mg/L mg/L CFU/100mL mg/L mg/L mg/L mg/L mg/L		13-DEC-18 09-DEC-18 06-DEC-18 07-DEC-18 11-DEC-18 18-DEC-18 11-DEC-18 10-DEC-18	R4393652 R4384278 R4382187 R4388287 R4388287 R4388287 R4400354 R4393639 R4389590

#### Sample Parameter Qualifier Key:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.
RRV	Reported Result Verified By Repeat Analysis
Test Method	1 References:

#### ALS Test Code Matrix Method Reference\*\* **Test Description** BOD-BC-CL Biochemical Oxygen Demand (BOD) APHA 5210 B-5 day Incub.-O2 electrode Water This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation. COD-T-COL-CL Water Chemical Oxygen Demand (COD) APHA 5220 D Colorimetry The Chemical Oxygen Demand (COD) test is used to estimate the amount of organic matter in the water. The sample is added to COD tubes, which contain a premixed volume of reagents. The sample is then heated for two hours on the COD reactor with a strong oxidizing agent, potassium dichromate. The COD reagents also contain silver and mercury ions. Silver is used as a catalyst and mercury is used to complex chloride interference. Oxidizable organic compounds react, reducing the dichromate ion to green chromic ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is measured colormetrically and a decrease in absorbance at 420 nm is proportional to the COD. Samples with concentrations > 150 mg/L can be diluted into the linear range. FCC-MF-CL Water Fecal Coliform Count-MF APHA 9222D This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level. N2N3-CALC-CL Water Nitrate+Nitrite CALCULATION NH3-F-CL Water Ammonia by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al. NO2-IC-N-CL Water Nitrite in Water by IC EPA 300.1 (mod) Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. NO3-IC-N-CL Water Nitrate in Water by IC EPA 300.1 (mod) Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. P-T-COL-CL Total P in Water by Colour **APHA 4500-P PHOSPHORUS** Water This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample. APHA 4500 H-Electrode PH-CL Water pН pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed) PO4-DO-COL-CL Water Diss. Orthophosphate in Water by Colour **APHA 4500-P PHOSPHORUS** This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. TSS-CL **Total Suspended Solids** APHA 2540 D-Gravimetric Water This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C. \*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

#### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Chain of Custody Num	bers:		

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

#### **ALS Environmental**

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, VSL 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: <sup>6</sup> Fort SL 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 Fort McMurray AB, Bay 1, 245 Macdonaid Cr, T9H 485, 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: 1 Calgery AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tal: 403-291-9897 Toll Free: 1-800-668-9878 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-9370 Toll Free: 1-800-667-7645 Fa:



L2206878-COFC

SEND REPOR	NT TO:				CHAIN OF	cus	то	DΥ	FO	RM			_					PAĜE	OF	
COMPANY	FERNIE ALPINE RESORT	UTILITIES CORPO	RATION	ATTN:	PATRICK MAJER	AN	ALYS	SIS F	REQU	JEST	ED:							<del>-</del>		
	1505 - 17TH Avenue South	East																Ple	iase sh	p
	CALGARY	PROV. ALBER	RTA	POSTAL CODE:	T2T 0E2		1							1				BU	ance he	ind
FI	1 - 800 - 258 - 7669	FAX: 403 - 2	44 - 3774	SAMPLER:	Hungry Baytaluke													0.00	les u	Ţ
	MEAND NO.: FARUC-F	all 2018 EMS wk #	1	QUOTE NO:									1					Br	Do X6	
	1	ALS CONTACT	Nancy Sonompi	i@ALSGlobal.co	om													Ray	the 5X	6
EPORT FOI		╡ <mark>╱</mark> ╺┝	- \\// ¤	p paje (Qskirc	<u>pr.com</u>	oliforms												Nut	riest4× hi4K6	6
WO#			DATE / TIME	COLLECTED	MATRIX	al C	6		ਿਖ	ы Б	3-N	N-0	2-N	s   o				NO.	TES (sample spec	lic .
	SAMPLEIDENTI	FICATION	YYYY-MM-DD	TIME		<u>Fe</u>	l Si	표	ō	절	Ŧ	2	2 2	2 3					nems, bue dates, e	u.,
	WWTP Influent Routine	1	2018 - 12 - 5	14:00	Water		X	×				_			-			temp =	_(/	<u>с</u>
	WWTP Influent BOD	2	2018 - 12 - 5	14:00	Water								;	<u> </u>				temp =	DIU	c
								 				_						<u> </u>		
	WWTP Effluent Routine	3	2018 - 12 - 5	14:15	Water		х	X						×				temp =		<u> </u>
	WWTP Effluent BOD		2018 - 12 - 5	14:15	Water								:	<u>×  </u>			_	temp =	$ \gamma $	<u> </u>
	WWTP Effluent Nutrient	5.	2018 - 12 - 5	14:15	Water			[	X	х	х	х	х			_	_	temp =	$\left  \int J \right $	c
	WWTP Effluent Bacti	6	2018 - 12 - 5	14:15	Water	х												temp =	· / / -	_ C
>.		· · · · · · · · · · · · · · · · · · ·																	<u> </u>	
z –	Elkriver Upstream Routine	7	2018 - 12 - 5	14:30	Water		X	X										temp =	$-\Lambda -\mu$	_ C
ы. 	Elkriver Upstream Nutrient	· '8'	2018 - 12 - 5	14:30	Water			ļ	Х	x	х	х	x				_	temp =		С
	Elkriver Upstream Bacti	9	2018 - 12 - 5	14:30	Water	×												temp =	$\psi, v$	С
5,																				
<u>ت</u> ا	Elkriver Outfall Routine		2018 - 12 - 5	14:45	Water		X	X	Γ									temp =	$\cdot + \bigcirc$	C
	Elkriver Outfall Nutrient	11	2018 - 12 - 5	14:45	Water				X	х	x	X	X					temp =	·   _/	c
	Elkriver Outfall Bacti	12	2018 - 12 - 5	14:45	Water	X			<u> </u>									temp =	. 1.	С
	···						1				Γ									-/
	Elkriver downstream Rout	ine 13	2018 - 12 - 5	15:00	Water		x	X										temp :	<u>- A -</u>	/c
	Elkriver downstream Nutri	ent 14	2018 - 12 - 5	15:00	Water			<b> </b>	X	X	х	х	X					temp =	<u>•    [</u>	С
i	Elkriver downstream Bact	15	2018 - 12 - 5	15:00	Water	X	1											temp :	<u> </u>	С
		<u> </u>				_									_					
			SPECIFY DATE:	;	(surcharge may apply)	<b>_</b>		REL		ISHED	BY:		DA	TE: 20	18 – 1	2 - 5	RECEIV	ÆÐ-BY:	DATE: 12	′6 <u>,</u>
TURN AROL	JND REQUIRED:	I ALV		<u> </u>				нu	NGR	BAY	TALL	IKE	TI	VE:	5:0	00 pm	4	Z_	TIME: 9:	20
SEND INVO				$\mathbf{H}$	RF			REL	INQU	ISHED	BY:		DA	TE:			RECEIV	ED 8Y:	DATE:	
INVOICE FO		T''i		} `									т	ME:					TIME:	
SPECIAL IN	STRUCTIONS: PLEASE FAU	X A COPY OF THE	RESULTS TO 25	0-423-4652 OR	E-MAIL TO			FØ	RLA	B US	E OI	NLY				ą_				
	wastewater@	gskifernie.com						Coo	oler Se	al Inta	ct?		Sample	Tempe	rature:	<u>s</u>		soling Meth	10d?	~~~
									Yes	No		A/A	Frozen	<u> Y</u>	es	nto		_icepacks	<u> </u>	



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 13-DEC-18 Report Date: 28-DEC-18 10:57 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2209949 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - FALL 2018 EMS WEEK #2 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

FARUC - FALL 2018 EMS WEEK #2

L2209949 CONTD.... PAGE 2 of 5 Version: FINAL

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 12-DEC-18 @ 14:00							
Matrix: WATER							
Maux. WATER Miscellaneous Parameters							
Biochemical Oxygen Demand	42	DLHC	20	ma/L		13-DEC-18	R4401508
Total Suspended Solids	48.0	DLHC	9.0	ma/L		17-DEC-18	R4400807
pH .	7.97		0.10	Ha		13-DEC-18	R4395413
				-			
Sampled By: HB on 12-DEC-18 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		20-DEC-18	R4405928
Biochemical Oxygen Demand	<2.0		2.0	mg/L		13-DEC-18	R4401508
Chemical Oxygen Demand	<10		10	mg/L		18-DEC-18	R4402051
Orthophosphate-Dissolved (as P)	0.152		0.0050	mg/L		15-DEC-18	R4396544
Coliform Bacteria - Fecal	<1		1	CFU/100mL		13-DEC-18	R4396156
Nitrate (as N)	27.9	DLHC	0.10	mg/L		13-DEC-18	R4396158
Nitrite (as N)	<0.050	DLHC	0.050	mg/L		13-DEC-18	R4396158
Phosphorus (P)-Total	0.219		0.0050	mg/L		21-DEC-18	R4409788
Total Suspended Solids	<3.0		3.0	mg/L		17-DEC-18	R4400807
pH	8.00		0.10	pН		13-DEC-18	R4395413
L2209949-3 ELKRIVER UPSTREAM							
Sampled By: HB on 12-DEC-18 @ 14:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.062		0.050	mg/L		20-DEC-18	R4405928
Orthophosphate-Dissolved (as P)	0.0104		0.0050	mg/L		15-DEC-18	R4396544
Coliform Bacteria - Fecal	<1		1	CFU/100mL		13-DEC-18	R4396156
Nitrate (as N)	2.10		0.020	mg/L		13-DEC-18	R4396158
Nitrite (as N)	<0.010		0.010	mg/L		13-DEC-18	R4396158
Phosphorus (P)-Total	<0.0050	RRV	0.0050	mg/L		21-DEC-18	R4409788
Total Suspended Solids	4.7		3.0	mg/L		17-DEC-18	R4400807
pH	5.56		0.10	рН		13-DEC-18	R4395413
L2209949-4 ELKRIVER OUTFALL							
Sampled By: HB on 12-DEC-18 @ 16:45							
Matrix: WATER							
Miscellaneous Parameters	_						<b>_</b>
Ammonia, Total (as N)	<0.050		0.050	mg/L		20-DEC-18	R4405928
Orthophosphate-Dissolved (as P)	0.0198		0.0050	mg/L		15-DEC-18	R4396544
Coliform Bacteria - Fecal	11		1	CFU/100mL		13-DEC-18	R4396156
Nitrate (as N)	0.124		0.020	mg/L		13-DEC-18	R4396158
Nitrite (as N)	<0.010	551	0.010	mg/L		13-DEC-18	R4396158
Phosphorus (P)-I otal	0.0106	KKV	0.0050	mg/L		21-DEC-18	K4409788
i otal Suspended Solids	<3.0		3.0	mg/L		17-DEC-18	R4400807
	4.88		0.10	рн		13-DEC-18	K4395413
L2209949-5 ELKRIVER DOWNSTREAM							
Sampled By: HB on 12-DEC-18 @ 15:00							
Matrix: WATER Miscollanoous Parametera							
Ammonia Total (as N)			0.050	ma/l		20-DEC 19	D440E020
Arthonhosnhate-Dissolved (as P)	<0.000 0.0109		0.000	mg/L		15-DEC 10	RA306544
Chilophosphale Dissolved (as 1)	0.0190		0.0000	iiig/L		13-020-16	114390344

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2209949-5 ELKRIVER DOWNSTREAM Sampled By: HB on 12-DEC-18 @ 15:00 Matrix: WATER Coliform Bacteria - Fecal Nitrate (as N) Nitrite (as N) Phosphorus (P)-Total Total Suspended Solids pH	1 2.08 <0.010 <0.0050 <3.0 8.32	RCR	1 0.020 0.010 0.0050 3.0 0.10	CFU/100mL mg/L mg/L mg/L mg/L pH		13-DEC-18 13-DEC-18 13-DEC-18 27-DEC-18 17-DEC-18 13-DEC-18	R4396156 R4396158 R4396158 R4411807 R4400807 R4395413
	0.02		0.10	P11			

#### Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Raise	d: Dilution required due to high concentration o	f test analyte(s).
RCR	Result Confirmed Afte	er Data Review	
RRV	Reported Result Verif	ied By Repeat Analysis	
Test Method R	oferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is oxygen demand dissolved oxyger BOD (CBOD) is	carried out using proce (BOD) are determined n meter. Dissolved BOI determined by adding	dures adapted from APHA Method 5210B - "Bid by diluting and incubating a sample for a speci D (SOLUBLE) is determined by filtering the sam a nitrification inhibitor to the diluted sample prio	ochemical Oxygen Demand (BOD)". All forms of biochemical fied time period, and measuring the oxygen depletion using a through a glass fibre filter prior to dilution. Carbonaceous r to incubation.
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
The Chemical O contain a premix dichromate. The Oxidizable organ measured colorr into the linear ra	xygen Demand (COD) ed volume of reagents COD reagents also co ic compounds react, re netrically and a decrea nge.	test is used to estimate the amount of organic r . The sample is then heated for two hours on th ntain silver and mercury ions. Silver is used as educing the dichromate ion to green chromic ion se in absorbance at 420 nm is proportional to th	matter in the water. The sample is added to COD tubes, which e COD reactor with a strong oxidizing agent, potassium a catalyst and mercury is used to complex chloride interference. h. For samples in the 10 - 150 mg/L range the remaining Cr6+ is the COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is Coliform bacteria involves an initia bacteria (Fecal)	carried out using proce a is enumerated by cult I 24 hour incubation at and is used for non-tur	dures adapted from APHA Method 9222 "Meml uring and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriate bid water with a low background bacteria level.	orane Filter Technique for Members of the Coliform Group". Jume is filtered through a 0.45 micron membrane filter. The test growth medium. This method is specific for thermotolerant
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is of of Chemistry, "Fallenging of Chemistry, "Fallenging of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second	carried out, on sulfuric low-injection analysis v	acid preserved samples, using procedures mod ith fluorescence detection for the determination	lified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with conductivity and/or UV det	ection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with conductivity and/or UV det	ection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate dige	carried out using proce stion of the sample.	dures adapted from APHA Method 4500-P "Pho	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determined hold time from ti	d in the laboratory using me of sampling (field a	g a pH electrode. All samples analyzed by this nalysis is recommended for pH where highly ac	method for pH will have exceeded the 15 minute recommended curate results are needed)
PO4-DO-COL-C	L Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using proce on a sample that has I	dures adapted from APHA Method 4500-P "Pho been lab or field filtered through a 0.45 micron r	osphorus". Dissolved Orthophosphate is determined nembrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is ( (TSS) are deterr	carried out using proce nined by filtering a sam	dures adapted from APHA Method 2540 "Solids ple through a glass fibre filter, and by drying th	s". Solids are determined gravimetrically. Total suspended solids e filter at 104 deg. C.
** ALS test metho	ds may incorporate mo	odifications from specified reference methods to	improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA
Chain of Custody Numbers:	

#### **Test Method References:**

ALS Test Code	Matrix	Test Description	Method Reference**
---------------	--------	------------------	--------------------

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

#### **ALS Environmental**

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, VSL 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700 Fort SL, John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587 Grand Praine AB, 9595 - 111 Street, T8V SW1, 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: 1-800-668-9876 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

SEN	D REPORT TO	);						CHAIN OF	CUS	то	DY	FO	RM				-	•				<u></u> '	PAGE		OF	
сом	IPANY:	FERNIE ALF	INE RESORT L	JTILITIES (	CORPO	RATION	ATTN	PATRICK MAJER	AN	ALY	SIS F	REQL	JEST	ED:							<b></b>			<u></u>		
ADDI	RESS:	1505 - 17TH	Avenue South	East						ļ	اعدىم ا				ـــــــــــــــــــــــــــــــــــــ								1			<b>^</b> `
CITY	·:	CALGARY		PROV:	ALBER	ТА	POSTAL CODE	T2T 0E2									١U						Au	pre	W	ur
TEL:		1 - 800 - 25	8 - 7669	FAX:	403 - 2	44 - 3774	SAMPLER	Hungry Baytaluke															ĺ.		1	90
PRO	JECT NAME A	ND NO.:	FARUC – Fa	II 2018 EM	S wk # :	2			_ '				L2	209	949	9-C	OFC	;					PW	7		
PON	NO.:			ALS CC	NTACT:	Nancy Sonompi	@ALSGlobal.co	om																V		
REP	ORT FORMAT	:				- I\/I / 		<u>xr.com</u>	coliforms				<b>-</b>		••• ••											
	WO#	s	AMPLE IDENTIFI	CATION		DATE / TIME	COLLECTED	MATRIX	10	0		thoF	tal P	N-61	03-N	02-N	202	8			1	[	NOT	ES (se tends, d	umple sp ue date:	vecific s. etc.)
L						YYYY-MM-DD	TIME		ă L	<u>₽</u>	표	δ.	4	ц,	ž	ž.	<u> </u>	<u>ŏ</u>	┥—┥	$\left  - \right $	-	<b>├</b> ┣		<u> </u>		
		WWTP Influ	ent Routine			2018 - 12- 12	14:00	Water		×	×									$\square$	-	<sup>1</sup>	temp =	(4	$\mathcal{C}$	
		WWTP Influ	ent BOD		2	2018 - 12- 12	14:00	Water		<u> </u>	-			_			X			┝─┦	┟──┥	└──┦	temp =	Å		<u> </u>
											<b> </b>							 			<b> </b>	┟──┨			-	
		WWTP Efflu	ent Routine		3	2018 - 12- 12	14;15	Water		X	X					<u> </u>	<u> </u>	X		$\vdash$		┝──┤	temp =	4	—	
		WWTP Efflu	ent BOD		4	2018 - 12- 12	14:15	Water			<u> </u>						×				<b>↓</b>	<b> </b> '	temp =	$\perp$	╄┥	<u>// c</u>
		WWTP Efflu	ent Nutrient		5	2018 - 12- 12	14:15	Water				X	х	X	×	X				<b> </b>	$\mid$	Ľ	temp =	$\perp$	14	<u>7                                    </u>
		WWTP Efflu	ient Bacti		6	2018 - 12 - 12	14:15	Water	<u>×</u>	ļ	<u> </u>									<u>                                     </u>			temp =	<u> </u>	<u>l  (</u>	<u> </u>
Γ											<u> </u>						<u> </u>		—	$\vdash$	┟──┤	$\vdash$				
ð		Elkriver Ups	Iream Routine		1	2018 - 12- 12	14:30	Water		X	×								<u> </u>	_──	$\mid$	$\vdash$	temp =	-	Ŧ	
USE		Elkriver Ups	tream Nutrient		<u> </u>	2018 - 12- 12	14:30	Water				X	X	X	×_	X				$\vdash$	$\square$		temp =	<u>_</u> {.	$\vdash \!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	
AB		Elkriver Ups	tream Bacti			2018 - 12 12	14:30	Water	X					<b> </b>				ļ		$\square$			temp =		<u> </u>	<u> </u>
ц Ч					,									<b></b>		<u> </u>	<u> </u>		ļ	<u> </u>						
R		Elkriver Out	fall Routine		O	2018 - 12- 12	14:45	Water		X	X				ļ				1				temp =		+	<u>7 c</u>
		Elkriver Ou	utfall Nutrient		11_	2018 - 12- 12	14:45	Water		-		X	X	X	×	×		<u> </u>					temp =	4	L	<u>r c</u>
		Elkriver Out	fall Bacti		12	2018 - 12- 12	14:45	Water	х			<u> </u>	1	<u> </u>			<u> </u>	ļ	-				temp =	W	<u> </u>	<u> </u>
					17_			ļ			_	<b> </b>		<b> </b>				<u> </u>		<b>_</b>	<u> </u>					
·		Elkriver dow	nstream Routin	6	12	2018 - 12 12	15:00	Water		X	×				<u> </u>	_				┥	<u> </u>		temp =	<del></del>		<u> </u>
		Elkriver dow	nstream Nutrier	nt	14_	2018 - 12- 12	15:00	Water			1	X	X	X	x	×	ļ						temp =		$\square$	<u>r c</u>
		Elkriver dow	instream Bacti		15	2018 - 12- 12	15:00	Water	X				<u> </u>			ļ			ļ	<u> </u>			temp =	$\downarrow \!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	<u>+</u>	C
																		<u> </u>	<u> </u>	<u> </u>			<u> </u>			<del></del>
			• K	( þ	R	SPECIFY DATE:	·	(surcharge may apply)			REL	INQU	ISHED	BY:			DATE	201	18 13	2- 12	REC	EIVED	BY:	DATE	12	<u> }</u>
	KN AROUND P	CEQUIRED:		<b>•</b> ·							HU	NGR	/ BAY	TALL	JKE	<b> </b>	TIME	:	5:0	00 pm	-	<u>_</u>	<u>́</u>	TIME	: <b> </b>	9:00
SEN	ND INVOICE T	0;		Aľ	╘╻	<b>)</b>  ⊢		K F			REL	INQU	ISHED	) BY:			DATE	:	_		REC	EIVED	BY:	DATE		
INV	OICE FORMA	T:	▎ <b>▖┣╌┨</b> ╵	H.			<u> </u>										TIME	:						TIME	:	
SPE	ECIAL INSTRU	ICTIONS:	PLEASE FAX	A COPY C	FTHE	RESULTS TO 25	0-423-4652 OR	E-MAIL TO			FÒ	RLA	BUS	SE O	NLY	10										
			wastewater@s	skilernie.co							Coc	ver Se Yes	al Inta No	ict7	N/A	San From	iple To 2en?	empe: ≏Y≏	returio: 	No	уC	Coolir   In	ng Metric zebacks	лғ Іс	e	None
[												105	N0		HIM .	1-102						<u></u> _				



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 20-DEC-18 Report Date: 04-JAN-19 14:58 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2213201 Project P.O. #: NOT SUBMITTED Job Reference: FARUC - FALL 2018 EMS WK #3 C of C Numbers: Legal Site Desc:

Comments: ADDITIONAL 02-JAN-19 15:03

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

FARUC - FALL 2018 EMS WK #3

L2213201 CONTD.... PAGE 2 of 5 Version: FINAL

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 19-DEC-18 @ 14:00							
Matrix: WATER							
Maux. WATER Miscellaneous Parameters							
Biochemical Oxygen Demand	65	DLHC	20	ma/L		22-DEC-18	R4415949
Total Suspended Solids	98.8	DLHC	6.0	mg/L		23-DEC-18	R4414188
pH	7.72		0.10	pH		24-DEC-18	R4414029
12213201-2 WWTP EFELUENT							
Sampled By: HB on 19-DEC-18 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		27-DEC-18	R4417495
Biochemical Oxygen Demand	<2.0		2.0	mg/L		22-DEC-18	R4415949
Chemical Oxygen Demand	<10		10	mg/L		28-DEC-18	R4419125
Orthophosphate-Dissolved (as P)	0.335	DLHC	0.050	mg/L		22-DEC-18	R4412127
Coliform Bacteria - Fecal	6		1	CFU/100mL		20-DEC-18	R4412754
Nitrate (as N)	21.2		0.020	mg/L		20-DEC-18	R4412308
Nitrite (as N)	<0.010		0.010	mg/L		20-DEC-18	R4412308
Phosphorus (P)-Total	0.445		0.020	mg/L	03-JAN-19	04-JAN-19	R4427733
Total Suspended Solids	<3.0		3.0	mg/L		23-DEC-18	R4414188
рН	8.09		0.10	pН		24-DEC-18	R4414029
L2213201-3 ELKRIVER UPSTREAM							
Sampled By: HB on 19-DEC-18 @ 14:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		27-DEC-18	R4417495
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		22-DEC-18	R4412127
Coliform Bacteria - Fecal	3		1	CFU/100mL		20-DEC-18	R4412754
Nitrate (as N)	1.88		0.020	mg/L		20-DEC-18	R4412308
Nitrite (as N)	<0.010		0.010	mg/L		20-DEC-18	R4412308
Phosphorus (P)-Total	<0.020		0.020	mg/L	03-JAN-19	04-JAN-19	R4427733
Total Suspended Solids	<3.0		3.0	mg/L		23-DEC-18	R4414188
рН	8.41		0.10	рН		24-DEC-18	R4414029
L2213201-4 ELKRIVER OUTFALL							
Sampled By: HB on 19-DEC-18 @ 14:45							
Matrix: WATER							
	0.050		0.050				D4447405
Arthonhosphate_Dissolved (as P)	<0.020		0.050	mg/L		21-DEC-18	R441/495
Coliform Bacteria - Fecal	0.0220		0.0050	CELI/100ml		22-DEC-18	R4412121
Nitrate (as NI)	∠ I 0.170		1	ma/l		20-DEC-10 20-DEC-19	R4412104
Nitrite (as N)	~0.170		0.020	ma/l		20-DEC-10 20-DEC-19	RAA12200
Phosphorus (P)-Total	0.010		0.010	ma/l	<u>03-</u> ΙΔΝ₋10	10 DE0-10	RAA27722
Total Suspended Solids	6.0		3.020	ma/L	00-07-11-13	23-DEC-18	R4414188
pH	8.25		0.10	nH		24-DEC-18	R4414020
	0.20		0.10	P''		2.020-10	117023
L22 1320 1-3 ELKRIVER DOWINSTREAMSampled By: HB on 10-DEC-18 @ 15:00							
Matrix WATED							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	ma/L		27-DEC-18	R4417495
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	ma/L		22-DEC-18	R4412127
				3			

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2213201-5 ELKRIVER DOWNSTREAM Sampled By: HB on 19-DEC-18 @ 15:00 Matrix: WATER Coliform Bacteria - Fecal Nitrate (as N) Nitrite (as N) Phosphorus (P)-Total Total Suspended Solids oH	6 1.73 <0.010 <0.020 <3.0 8 39		1 0.020 0.010 0.020 3.0 0.10	CFU/100mL mg/L mg/L mg/L mg/L nH	03-JAN-19	20-DEC-18 20-DEC-18 20-DEC-18 04-JAN-19 23-DEC-18 24-DEC-18	R4412754 R4412308 R4412308 R4427733 R4414188 R4414029
	0.39		0.10				

#### Sample Parameter Qualifier Key:

Qualifier	Description								
DLHC	Detection Limit Raised	d: Dilution required due to high concentration	on of test analyte(s).						
Test Method Re	ferences:								
ALS Test Code	Matrix	Test Description	Method Reference**						
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode						
This analysis is ca oxygen demand (l dissolved oxygen BOD (CBOD) is d	arried out using proced BOD) are determined meter. Dissolved BOE etermined by adding a	lures adapted from APHA Method 5210B - by diluting and incubating a sample for a s 0 (SOLUBLE) is determined by filtering the nitrification inhibitor to the diluted sample	"Biochemical Oxygen Demand (BOD)". All forms of biochemical pecified time period, and measuring the oxygen depletion using a sample through a glass fibre filter prior to dilution. Carbonaceous prior to incubation.						
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry						
The Chemical Ox contain a premixe dichromate. The C Oxidizable organic measured colorm into the linear ran	The Chemical Oxygen Demand (COD) test is used to estimate the amount of organic matter in the water. The sample is added to COD tubes, which contain a premixed volume of reagents. The sample is then heated for two hours on the COD reactor with a strong oxidizing agent, potassium dichromate. The COD reagents also contain silver and mercury ions. Silver is used as a catalyst and mercury is used to complex chloride interference. Oxidizable organic compounds react, reducing the dichromate ion to green chromic ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is measured colormetrically and a decrease in absorbance at 420 nm is proportional to the COD. Samples with concentrations > 150 mg/L can be diluted into the linear range.								
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D						
This analysis is ca Coliform bacteria involves an initial bacteria (Fecal) a	arried out using proced is enumerated by cult 24 hour incubation at nd is used for non-turk	lures adapted from APHA Method 9222 "M uring and colony counting. A known sample 44.5 degrees C of the filter with the approp bid water with a low background bacteria le	lembrane Filter Technique for Members of the Coliform Group". e volume is filtered through a 0.45 micron membrane filter. The test riate growth medium. This method is specific for thermotolerant vel.						
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC						
This analysis is ca of Chemistry, "Flo al.	arried out, on sulfuric a w-injection analysis w	acid preserved samples, using procedures ith fluorescence detection for the determine	modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society ation of trace levels of ammonium in seawater", Roslyn J. Waston et						
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)						
Inorganic anions a	are analyzed by Ion Cl	nromatography with conductivity and/or UV	detection.						
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)						
Inorganic anions a	are analyzed by Ion Cł	nromatography with conductivity and/or UV	detection.						
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS						
This analysis is ca persulphate diges	arried out using proced tion of the sample.	lures adapted from APHA Method 4500-P	"Phosphorus". Total Phosphorus is determined colourimetrically after						
PH-CL	Water	рН	APHA 4500 H-Electrode						
pH is determined hold time from time	in the laboratory using ne of sampling (field ar	a pH electrode. All samples analyzed by t alysis is recommended for pH where high	his method for pH will have exceeded the 15 minute recommended y accurate results are needed)						
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS						
This analysis is ca colourimetrically c	arried out using proced on a sample that has b	lures adapted from APHA Method 4500-P een lab or field filtered through a 0.45 micr	"Phosphorus". Dissolved Orthophosphate is determined on membrane filter.						
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric						
This analysis is ca (TSS) are determi	arried out using proced ined by filtering a sam	lures adapted from APHA Method 2540 "S ple through a glass fibre filter, and by dryin	olids". Solids are determined gravimetrically. Total suspended solids g the filter at 104 deg. C.						
** ALS test method	s may incorporate mo	difications from specified reference method	ds to improve performance.						
The last two letter	s of the above test co	de(s) indicate the laboratory that performed	analytical analysis for that test. Refer to the list below:						
Laboratory Defin	ition Code Labor	atory Location							

ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

#### **Test Method References:**

ALS Test Code	Matrix	Test Description	Method Reference**
---------------	--------	------------------	--------------------

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.
### ALS Environmental

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

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: 250-261-555 Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 760-791-1586 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 F Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tol: 403-291-9897 Toll Free: 1-800-668-Saskatoon SK, 619 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645



SEND REPO	RT TO:				CHAIN OF	CUS	STO	DY	FC	RN	1			È						
COMPANY:	FERNIE ALPINE RESORT	UTILITIES CORPO	ORATION	ATTN:	PATRICK MAJER	AN	ALY	SIS	REQ	UES	TED:									
ADDRESS:	1505 - 17TH Avenue South	East									[								Λι	
слту:	CALGARY	PROV: ALBEI	RTA	POSTAL CODE:	T2T 0E2				1		-						1			1
TEL:	1 - 800 - 258 - 7669	FAX: 403 - 2	244 - 3774	SAMPLER:	Hungry Baytaluke								i			1			HWNM	م '
PROJECT NA	ME AND NO.: FARUC-F	all 2018 EMS wk #	3	QUOTE NO:				ĺ			[		·							$\cap$
PO NO.:		ALS CONTACT	Nancy Sonompi	I@ALSGlobal.co	m	1													Hi/	$\bigcirc$
			- 1\// /	p naie to skiro	r.com														IX'	
REPORT FOR						form														
WO#			DATE / TIME		l	- 3			٩	٩	z	z	z	_ س						
ľ	SAMPLE IDENTIF	CATION	YYYY-MM-DD	TIME	MATRIX	8	S	Ŧ	Ę	[otal	불	ço,	ζΟ,	õ	8	-			NOTES (sam comments, due	ple specific dates, etc.)
	WWTP Influent Routine	1	2018 - 12- 19	14:00	Water		X	x	Ť		-	<u>~</u> .	-		<u> </u>		- [	+	temp = 🕢	1 0
	WWTP Influent BOD	1/	2018 - 12- 19	14:00	Water		<u> </u>		·····	1	-	+		x	-+			╡╴┨	temp = // I	1
				· · · · · · · · · · · · · · · · · · ·			1	1	1			$\square$			-			╡╴┨	······································	+
	WWTP Effluent Routine	3	2018 - 12- 19	14:15	Water		×	x		-					x		+	╎╴┨	temp =	c
	WWTP Effluent BOD		2018 - 12- 19	14:15	Water							1		x	-1				temp = [ ]	NC
	WWTP Effluent Nutrient		2018 - 12- 19	14:15	Water		1		x	x	x	x	x	-	-+				temp =	Xc
	WWTP Effluent Bacti	6	2018 - 12- 19	14:15	Water	x	ſ		· · · ·					- 1	$\neg$				temp =	. <del>()</del>
>		<u>_</u>	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	1-						1			[			1		
l z – – –	Elkriver Upstream Routine	1	2018 - 12- 19	14:30	Water		x	x	1										temp =	<b>^</b> c
ы Ш	Elkriver Upstream Nutrient	2	2018 - 12- 19	14:30	Water				x	x	x	x	X						temp = 1	<u>'</u> ~ c
	Elkriver Upstream Bacti	9	2018 - 12- 19	14:30	Water	X												+	temp = 1	
		•							<u> </u>		1									••
<u>8</u>	Elkriver Outfall Routine	10	2018 - 12- 19	14:45	Water		x	X								-1			temp = 🔥	1 c
	Elkriver Outfall Nutrient	11	2018 - 12- 19	14:45	Water			1	x	X	x	X	x						temp = /	/ c
	Elkriver Outfall Bacti	12	2018 - 12- 19	14:45	Water	X						,							temp = / T	K c
						-		Í												
	Elkriver downstream Routin	e (3	2018 - 12- 19	15:00	Water		x	X		-									temp = 🔥	, c
	Elkriver downstream Nutrie	nt 14	2018 - 12- 19	15:00	Water			1	x	x	x	X	х						temp = /	c
	Elkriver downstream Bacti	15	2018 - 12- 19	15:00	Water	×		1.				<u> </u>	_						temp = /	c
			,	······································		-		- 1	• • • • • • • •	÷.		1		-					/ •	
			SPECIFY DATE:		(surcharge may apply)	/	·	REL	INQUI	SHED	BY:	<u> </u>		ATE:	2018-	- 12- 1	9 RE(	CEIVED	BY: DATE:	DD
TURN AROUN						-		HUN	IGRY	BAY	TALL	IKE	Т	IME:		5:00 p	m	1	L TIME:	89
SEND INVOIC	е то:							REL	INQUI	SHED	BY;		D	ATË:			REC	EIVED	BY: DATE:	
INVOICE FOR		┟╵┢┝		•									Т	IME:					TIME:	
SPECIAL INS	RUCTIONS: PLEASE FAX	A COPY OF THE F	RESULTS TO 250	-423-4652 OR E	-MAIL TO		_	FOF	R LAI	B US	E OI	NLY					,			
	wastewater@s	ikileimie.com						Çeol	er Sea	al Inte	ct?		Samp	le Terr	iperati	ne 🝸	_•¢	Coolin	ng Method?	
								۲ <u>–</u> ۱	res	_No		N/A	Froze	n?	Yes	No		IC6	epackstce	None



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 28-DEC-18 Report Date: 07-JAN-19 10:25 (MT) Version: FINAL

Client Phone: 403-258-7669

## Certificate of Analysis

Lab Work Order #: L2214870 Project P.O. #: NOT SUBMITTED Job Reference: F A R U C - FALL 2018 EMS WK # 4 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: KIRKI AND MATCHIM on 27-DEC-18 @	14.00						
Matrix: WATER	14.00						
Miscellaneous Parameters							
Biochemical Oxygen Demand	157	BODP	75	ma/L		28-DEC-18	R4425752
Total Suspended Solids	298	DLHC	23	ma/L		02-JAN-19	R4425290
Hq	7.34		0.10	Hq		04-JAN-19	R4427594
1 2214870-2 WWTP EFELUENT				•			
Sampled Bv: KIRKLAND MATCHIM on 27-DEC-18 @	14:15						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		03-JAN-19	R4427380
Biochemical Oxygen Demand	<2.0		2.0	mg/L		28-DEC-18	R4425752
Chemical Oxygen Demand	18		10	mg/L		29-DEC-18	R4419329
Orthophosphate-Dissolved (as P)	0.262		0.0050	mg/L		29-DEC-18	R4418962
Coliform Bacteria - Fecal	48		1	CFU/100mL		28-DEC-18	R4419159
Nitrate (as N)	31.3		0.020	mg/L		28-DEC-18	R4418887
Nitrite (as N)	<0.010		0.010	mg/L		28-DEC-18	R4418887
Phosphorus (P)-Total	0.335		0.0050	mg/L		02-JAN-19	R4423468
Total Suspended Solids	<3.0		3.0	mg/L		02-JAN-19	R4425290
рН	7.83		0.10	рН		04-JAN-19	R4427594
L2214870-3 ELKRIVER UPSTREAM							
Sampled By: KIRKLAND MATCHIM on 27-DEC-18 @	14:30						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		03-JAN-19	R4427380
Orthophosphate-Dissolved (as P)	0.0091		0.0050	mg/L		29-DEC-18	R4418962
Coliform Bacteria - Fecal	<1		1	CFU/100mL		28-DEC-18	R4419159
Nitrate (as N)	1.91		0.020	mg/L		28-DEC-18	R4418887
Nitrite (as N)	<0.010		0.010	mg/L		28-DEC-18	R4418887
Phosphorus (P)-Total	<0.0050	RRV	0.0050	mg/L		02-JAN-19	R4423468
Total Suspended Solids	<3.0		3.0	mg/L		02-JAN-19	R4425290
pH	8.35		0.10	рН		04-JAN-19	R4427594
L2214870-4 ELKRIVER OUTFALL							
Sampled By: KIRKLAND MATCHIM on 27-DEC-18 @	14:45						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Iotal (as N)	< 0.050		0.050	mg/L		03-JAN-19	R4427380
Orthophosphate-Dissolved (as P)	0.0230		0.0050	mg/L		29-DEC-18	R4418962
Coliform Bacteria - Fecal	59		1	CFU/100mL		28-DEC-18	R4419159
Nitrate (as N)	0.280		0.020	mg/∟		28-DEC-18	R4418887
Nitrite (as N)	<0.010		0.010	mg/L		28-DEC-18	R4418887
	0.0180	KKV	0.0050	rng/L		02-JAN-19	R4423468
	<3.0		3.0	mg/L		02-JAN-19	R4425290
рп 	8.20		0.10	р⊓		04-JAN-19	R4427594
L22148/0-5 ELKRIVER DOWNSTREAM	45.00						
Sampled By: KIRKLAND MATCHIM on 27-DEC-18 @	15:00						
Matrix: WATER							
Ammonia Total (as N)	-0.050		0.050	mc/l		02 10 11 10	D4407000
Arthonhoshata-Dissolved (as D)	<0.000			ma/l		20-DEC 10	D44427 300
Uniophosphale-Dissolved (ds F)	0.0105		0.0050	mg/∟		29-020-10	R4410902

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2214870-5 ELKRIVER DOWNSTREAM Sampled By: KIRKLAND MATCHIM on 27-DEC-18 @ Matrix: WATER Coliform Bacteria - Fecal Nitrate (as N) Nitrite (as N) Phosphorus (P)-Total Total Suspended Solids oH	<pre>15:00       &lt;1             1.86             &lt;0.010             &lt;0.0050             &lt;3.0</pre>	RRV	1 0.020 0.010 0.0050 3.0 0.10	CFU/100mL mg/L mg/L mg/L mg/L nH		28-DEC-18 28-DEC-18 28-DEC-18 02-JAN-19 02-JAN-19 04-JAN-19	R4419159 R4418887 R4418887 R4423468 R4425290 R4427594

### Sample Parameter Qualifier Key:

Qualifier	Description			
BODP	BOD dilution re	esults dif	fered by more than 30% RPD. Precision of repo	orted BOD result may be less than usual.
DLHC	Detection Limit	t Raised:	Dilution required due to high concentration of te	est analyte(s).
RRV	Reported Resu	ult Verifie	ed By Repeat Analysis	
Test Method Re	eferences:			
ALS Test Code	Mat	trix	Test Description	Method Reference**
BOD-BC-CL	Wate	er	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand dissolved oxygen BOD (CBOD) is o	arried out using (BOD) are detern meter. Dissolve determined by a	g procedu rmined b red BOD adding a	ures adapted from APHA Method 5210B - "Bioch y diluting and incubating a sample for a specifie (SOLUBLE) is determined by filtering the sampl nitrification inhibitor to the diluted sample prior to	nemical Oxygen Demand (BOD)". All forms of biochemical d time period, and measuring the oxygen depletion using a e through a glass fibre filter prior to dilution. Carbonaceous o incubation.
COD-T-COL-CL	Wate	er	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
The Chemical O2 contain a premix dichromate. The Oxidizable organ measured colorn into the linear ran	kygen Demand ( ed volume of rea COD reagents a ic compounds re netrically and a c nge.	(COD) te agents. <sup>-</sup> also cont eact, red decrease	est is used to estimate the amount of organic ma The sample is then heated for two hours on the tain silver and mercury ions. Silver is used as a lucing the dichromate ion to green chromic ion. I a in absorbance at 420 nm is proportional to the	tter in the water. The sample is added to COD tubes, which COD reactor with a strong oxidizing agent, potassium catalyst and mercury is used to complex chloride interference. For samples in the 10 - 150 mg/L range the remaining Cr6+ is COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Wate	er	Fecal Coliform Count-MF	APHA 9222D
This analysis is of Coliform bacteria involves an initial bacteria (Fecal) a	arried out using is enumerated 24 hour incubat and is used for n	g procedu by cultu ation at 4 non-turbi	ures adapted from APHA Method 9222 "Membra ring and colony counting. A known sample volur 4.5 degrees C of the filter with the appropriate g d water with a low background bacteria level.	ne Filter Technique for Members of the Coliform Group". ne is filtered through a 0.45 micron membrane filter. The test rowth medium. This method is specific for thermotolerant
NH3-F-CL	Wate	er	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is o of Chemistry, "Fl al.	arried out, on su ow-injection ana	ulfuric ac alysis wit	cid preserved samples, using procedures modifient h fluorescence detection for the determination o	ed from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society f trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Wate	er	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by	y Ion Chi	romatography with conductivity and/or UV detection	tion.
NO3-IC-N-CL	Wate	er	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by	y Ion Chi	romatography with conductivity and/or UV detection	tion.
P-T-COL-CL	Wate	er	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is o persulphate dige	arried out using stion of the sam	g procedu ople.	ures adapted from APHA Method 4500-P "Phos	ohorus". Total Phosphorus is determined colourimetrically after
PH-CL	Wate	er	рН	APHA 4500 H-Electrode
pH is determined hold time from tir	l in the laborator ne of sampling (	ry using (field and	a pH electrode. All samples analyzed by this me alysis is recommended for pH where highly accu	thod for pH will have exceeded the 15 minute recommended rate results are needed)
PO4-DO-COL-CL	- Wate	er	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c colourimetrically	arried out using on a sample tha	g procedu at has be	ures adapted from APHA Method 4500-P "Phosp een lab or field filtered through a 0.45 micron me	ohorus". Dissolved Orthophosphate is determined mbrane filter.
TSS-CL	Wate	er	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is o (TSS) are determ	arried out using nined by filtering	j procedi j a samp	ures adapted from APHA Method 2540 "Solids". le through a glass fibre filter, and by drying the f	Solids are determined gravimetrically. Total suspended solids liter at 104 deg. C.
** ALS test metho	ds may incorpora	rate mod	ifications from specified reference methods to in	nprove performance.
The last two lette	rs of the above	test cod	e(s) indicate the laboratory that performed analy	tical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA
Chain of Custody Numbers:	

### **Test Method References:**

ALS Test Code Matrix	Test Description	Method Reference**
	•	

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

P.O. Box 390, 154 Hwy 540B, Gore Bay, Ontario POP 1H0 Toll Free 1-800-265-1 www.manitoulintra	Manitoulin Transport Inc. Manitoulin Logistics Inc. Northwest Transport Ld. Pacific Northwest Carriers Inc. Reinbow Transport (1974) Lid. [485 nsport.com	. MId– Arctic Transporation C Dolfo Transport Inc. . Ridedale Transport Ltd. Exaita Transport Duckering's Transport Ltd.	5.7 	_2214870-CO	FC
Month Mors Jour AN BAL or Pro, No. 12 27 18	Unit No. ™ d'Unite 837059DP CO.	LPPD UALITY SYSTEM LL ISO,9001:2015	CAL 0501	19580477	/ #01
FERNIE ALPINE RESORTS, 5339	FERNIE SKI H	dress / Adresse HILL RD, FER	NIE, BC V	V0B1M6	
ALS CANADA LTD ENVIRONMENTA	AL, 2559 29 ST	<b>F NE</b> , CALGAR	Y, AB T1Y	Y7B5	
Danster (* Bransleker),	At/A I/O	* Bill To / Facturer (0074877) ALS CANAD	A LTD ENVI	RONMENTAL	
1.       PIECE COOLER       Description         DOLFOFAK-85 20181227 1       FUEL SURCHARGE         GST/TPS	9:34:10		Weignt / Poids F	Rate / Tant	Amount / Montani
Une of delivery and initialed by the delivery driver. Toute perte ou dominances riolvent être notés sur ta Received in or	ours, 2% per mole (24% per a	innee) sur comptes en so	uffrance		
fourthe d'expédition au moment de la livraison et light structure d'expédition au moment de la livraison et Signature X	Prin	it Name / Imprimer Nom		Total	
Date Received / Date de Réception (mmddyy)	In Time / Arrivée (hhmm)	906	Out Time / Départ (hhmm)		

Ľ

ALS Environmental

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel; 604-253-4188 Toll Free: 1-800-Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 (Fax: ) Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toli Free: 1-800-Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 78 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-6 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-



PAGE

ÔF

L2214870-COFC

### CHAIN OF CUSTODY FORM

SEN	ID REPORT T	0:						CHAIN OF	CUS	510	זט	FU	RIV	<u> </u>								P	AGE		ЭF	
COI	MPANY:	FERNIE AL	ALPINE RESORT UTILITIES CORPORATION ATTN					PATRICK MAJER	AN	ALYS	sis i	REQL	JEST	ED:	_											
ADD	DRESS:	1505 - 17TI	Avenue South	East																						
СП	—— Y:	CALGARY		PROV	ALBER	RTA	POSTAL CODE	T2T 0E2																		
TEL		1 - 800 - 2	58 - 7669	FAX	403 - 2	244 - 3774	SAMPLER	Kirkland Matchim																		
PRO	JECT NAME	AND NO.:	FARUC-F	all 2018 El	VIS wk #	4	QUOTE NO					ŀ							!							
PO	NO.:	<u> </u>		ALS C	ONTACT	Nancy Sonompi	@ALSGlobal.co	om				•														
-		<b>.</b>		4 /		- 1\ /1 /	p naje rejskire	cr.com																		
REF	PORT FORMA	T:						1	Ë			Į	1													I
┣	WO#	<del>,</del>						T	- 5			٩	6	z	z	z							<u> </u>	. <u></u>		
Į	****		SAMPLE IDENTIF	ICATION				MATRIX	ecal	8	Ŧ	ę	dal 1	H3-I	8 03	02-	ão	8					NOTE: commer	S (sample ris, due d	e specil lates, et	ίic. tc.)
┣			ent Routine		1	2018 - 12-27	14:00	Water		X	X	<u> </u>		Z	z	<u>z</u> _	8		┝╼╼╾┥		i – †	te		111	0	c
1	$\vdash \leq$	WAATP Infi	ient BOD			2018 - 12 - 27	14:00	Water		~		┨──	<u> </u>				x		┟──┤	$\left  \right $			+mp =	$\frac{1}{1}$	0	c
											<u> </u>							┝━┄┥	┝──┦						<u> </u>	
			uent Routine		2	2018 - 12-27	14:15	Water		x	x		<b> </b>					x	┝╌─┦			te		12	.6	С
	$\vdash \neq$		uent BOD		<u>4</u> -	2018 - 12-27	14:15	Water	+ ·	-	<u> </u>						x			- '		te	 ≥mo ≈	$\frac{1}{12}$	6	c
	$\leftarrow$	WWTP Fff	uent Nutrient		<u>र</u>	2018 - 12 - 27	14:15	Water		-		x	x	x	x	x				╏──┤		te		12.	6	с
		WWTP Eff	uent Bacti		Ť	2018 - 12-27	14:15	Water	+		<u>-</u>							┝ <b>─</b> ─┤		++		te		12.	<u>*</u>	c
≻					<u> </u>				+																<u>v</u>	-
Ż		Elikriver Up:	stream Routine		7	2018 - 12-27	14:30	Water		· X	x									┼─┥		te	emp ≈	0,	5	c
Ш		Elkriver Up:	stream Nutrient		8	2018 - 12-27	14:30	Water	-			X	x	х	x	x						te	emp =	0,	5	c
۱ ۵		Elkriver Up	stream Bacti		ġ_	2018 - 12-27	14:30	Water	×	<u> </u>			-	[				<b></b>	<b> </b>			te	≥mp =	0.	5	с
2					•				-																<u> </u>	
þ		Elkriver Ou	tfall Routine		10	2018 - 12-27	14:45	Water		x	×	·										te	emp =	0.7	{	С
	· · · · · · · · · · · · · · · · · · ·	Elkriver O	utfall Nutrient		Ū	2018 - 12-27	14:45	Water	1	1		x	x	x	x	x				++		tr	emp =	0.3	;;	С
ł		Elkriver Ou	tfall Bacti		$\overline{1}$	2018 - 12-27	14:45	Water	×	<u> </u>	1		1	<u> </u>						+ +	-+	te	emp =	0,7	3	с
		F				+						·				-								/		
1		Elkriver do	vnstream Routin	ne .	13	2018 - 12- 27	15:00	Water	1-	İx	x	<u> </u>	<b> </b> -	<u> </u>	<b> </b>					╞╼┦	†	tr	emp =	0.0	2	с
1		Elkriver dov	vnstream Nutrie	nt	14	2018 - 12-27	15:00	Water	1	1-	-	x	x	x	x	x		<u> </u>				tı	emp =	0+(	2	с
1		Elkriver dov	vnstream Bacti		15	2018 - 12-27	15:00	Water	1 x			1	<u>├</u> ─-		<u> </u>							tı	emp =	0,0	2	с
						<u> </u>	·	<u> </u>	-			1							<u> </u>			<b>†</b> -				
	<b>I</b> .	L .		Ι à	Ĩ	SPECIFY DATE:	ι	(surcharge may apply)			REL		SHED	) BY:			DATE:	201	8- 12	2- 27	RECE	EIVED B	iY: Di		XE	12
TU	RN AROUND F	REQUIRED:		L Y							Kirk	land I	Match	im			TIME:		5:C	10 pm	1	Z	т Т	IME:	4	20
SE		0:		Δ	F		┣━━ ┣━━━	RF			REL	INQU	ISHED	BY:			DATE:				RECE	EIVED B	iY: D,	ATE		
INV	OICE FORMA	T:	1 • <b>}-1</b>	Ζ'													TIME:						T	IME:		
SPE	ECIAL INSTRU	ICTIONS:	PLEASE FAX	A COPY (	OF THE	RESULTS TO 25	0-423-4652 OR	E-MAIL TO			FO	R <u>L</u> A	B US	E OI	NLY					مىسىت. سەربىر						
			wastewater@:	skifernie.c	m						Coo	ter Se	ai Inta	ct?		Sam	ple Te	mpera	ature:	4	°C	Cooling	Method	?		
1											j`	Yes _	No	!	€/A	Froz	en? _	Yer	<u>_</u> د	_No		lcer	packs _	_ice _	Nor	ne



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 03-JAN-19 Report Date: 10-JAN-19 10:28 (MT) Version: FINAL

Client Phone: 403-254-7669

## Certificate of Analysis

Lab Work Order #: L2216097 Project P.O. #: NOT SUBMITTED Job Reference: F A R U C - FALL 2018 EMS WK # 5 C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HUNGRY BAYTALUKE on 02-JAN-19 @	14:00						
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	178	DLHC	75	mg/L		04-JAN-19	R4436287
Total Suspended Solids	277	DLHC	15	mg/L		03-JAN-19	R4427534
pH	7.77		0.10	pH		07-JAN-19	R4432731
L2216097-2 WWTP EFFLUENT							
Sampled By: HUNGRY BAYTALUKE on 02-JAN-19 @	14:15						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.092	RRV	0.050	mg/L		07-JAN-19	R4430507
Biochemical Oxygen Demand	<2.0		2.0	mg/L		04-JAN-19	R4436287
Chemical Oxygen Demand	20		10	mg/L		07-JAN-19	R4431928
Orthophosphate-Dissolved (as P)	0.501		0.010	mg/L		04-JAN-19	R4428652
Coliform Bacteria - Fecal	54		1	CFU/100mL		03-JAN-19	R4429074
Nitrate (as N)	35.1	DLHC	0.10	mg/L		04-JAN-19	R4429300
Nitrite (as N)	0.109	DLHC	0.050	mg/L		04-JAN-19	R4429300
Phosphorus (P)-Total	0.689		0.020	mg/L	05-JAN-19	06-JAN-19	R4429575
Total Suspended Solids	3.3		3.0	mg/L		03-JAN-19	R4427534
рН	7.90		0.10	pН		07-JAN-19	R4432731
L2216097-3 ELKRIVER UPSTREAM							
Sampled By: HUNGRY BAYTALUKE on 02-JAN-19 @	14:30						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		07-JAN-19	R4430507
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		04-JAN-19	R4428652
Coliform Bacteria - Fecal	<1		1	CFU/100mL		03-JAN-19	R4429074
Nitrate (as N)	1.66		0.020	mg/L		04-JAN-19	R4429300
Nitrite (as N)	<0.010		0.010	mg/L		04-JAN-19	R4429300
Phosphorus (P)-Total	<0.020		0.020	mg/L	05-JAN-19	06-JAN-19	R4429575
Total Suspended Solids	<3.0		3.0	mg/L		03-JAN-19	R4427534
рН	8.34		0.10	рН		07-JAN-19	R4432731
L2216097-4 ELKRIVER OUTFALL							
Sampled By: HUNGRY BAYTALUKE on 02-JAN-19 @	14:45						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.116	RRV	0.050	mg/L		07-JAN-19	R4430507
Orthophosphate-Dissolved (as P)	0.033		0.010	mg/L		04-JAN-19	R4428652
Coliform Bacteria - Fecal	39		1	CFU/100mL		03-JAN-19	R4429074
Nitrate (as N)	1.33		0.020	mg/L		04-JAN-19	R4429300
Nitrite (as N)	0.041		0.010	mg/L		04-JAN-19	R4429300
Priosphorus (P)- I otal	0.033		0.020	mg/L	05-JAN-19	06-JAN-19	R4429575
i orai Suspended Solids	<3.0		3.0	mg/L		03-JAN-19	K442/534
μπ 	8.29		0.10	рн		07-JAN-19	K4432731
L2216097-5 ELKRIVER DOWN STREAM							
Sampled By: HUNGRY BAYTALUKE on 02-JAN-19 @	15:00						
Matrix: WATER							
Miscellaneous Parameters	-0.050		0.050	ma/l		07 14 14 40	D4400507
$\Delta (1) = \Delta (1) = \Delta (1)$	<0.050		0.050	mg/L		07-JAN-19	R4430507
Onnophosphale-Dissolved (as P)	<0.010		0.010	mg/L		04-JAN-19	R4428652

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2216097-5 ELKRIVER DOWN STREAM Sampled By: HUNGRY BAYTALUKE on 02-JAN-19 @ Matrix: WATER	15:00						
Coliform Bacteria - Fecal Nitrate (as N) Nitrite (as N) Phosphorus (P)-Total	2 1.63 <0.010 <0.020		1 0.020 0.010 0.020	CFU/100mL mg/L mg/L mg/L	05-JAN-19	03-JAN-19 04-JAN-19 04-JAN-19 06-JAN-19	R4429074 R4429300 R4429300 R4429575
Total Suspended Solids pH	<3.0 8.34		3.0 0.10	mg/L pH		03-JAN-19 07-JAN-19	R4427534 R4432731

### Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Raise	ed: Dilution required due to high concentratior	n of test analyte(s).
RRV	Reported Result Veri	fied By Repeat Analysis	
est Method F	References:		
ALS Test Code	e Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is oxygen demand dissolved oxyge BOD (CBOD) is	carried out using proce d (BOD) are determined en meter. Dissolved BO s determined by adding	edures adapted from APHA Method 5210B - " I by diluting and incubating a sample for a spe D (SOLUBLE) is determined by filtering the s a nitrification inhibitor to the diluted sample p	Biochemical Oxygen Demand (BOD)". All forms of biochemical ecified time period, and measuring the oxygen depletion using a ample through a glass fibre filter prior to dilution. Carbonaceous rior to incubation.
COD-T-COL-CI	- Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
The Chemical C contain a premi dichromate. Th Oxidizable orga measured color into the linear ra	Dxygen Demand (COD) xed volume of reagents e COD reagents also co inic compounds react, r metrically and a decrea ange.	test is used to estimate the amount of organ a. The sample is then heated for two hours on ontain silver and mercury ions. Silver is used educing the dichromate ion to green chromic use in absorbance at 420 nm is proportional to	ic matter in the water. The sample is added to COD tubes, which the COD reactor with a strong oxidizing agent, potassium as a catalyst and mercury is used to complex chloride interference. ion. For samples in the 10 - 150 mg/L range the remaining Cr6+ is to the COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is Coliform bacter involves an initi bacteria (Fecal)	carried out using proce ia is enumerated by cul al 24 hour incubation at and is used for non-tur	edures adapted from APHA Method 9222 "Me turing and colony counting. A known sample 44.5 degrees C of the filter with the appropri- bid water with a low background bacteria leve	mbrane Filter Technique for Members of the Coliform Group". volume is filtered through a 0.45 micron membrane filter. The test ate growth medium. This method is specific for thermotolerant el.
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is of Chemistry, "I al.	carried out, on sulfuric Flow-injection analysis v	acid preserved samples, using procedures m with fluorescence detection for the determinat	nodified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society ion of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anion	s are analyzed by Ion C	Chromatography with conductivity and/or UV c	letection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anion	s are analyzed by Ion C	Chromatography with conductivity and/or UV c	letection.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate dig	carried out using proce estion of the sample.	edures adapted from APHA Method 4500-P "F	Phosphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determine hold time from	ed in the laboratory usin time of sampling (field a	g a pH electrode. All samples analyzed by thi nalysis is recommended for pH where highly	is method for pH will have exceeded the 15 minute recommended accurate results are needed)
PO4-DO-COL-E	ED Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetricall	carried out using proce y on a sample that has	edures adapted from APHA Method 4500-P "F been lab or field filtered through a 0.45 micro	Phosphorus". Dissolved Orthophosphate is determined n membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is (TSS) are deter	carried out using proce mined by filtering a san	edures adapted from APHA Method 2540 "So nple through a glass fibre filter, and by drying	lids". Solids are determined gravimetrically. Total suspended solids the filter at 104 deg. C.
* ^ L C to ot an oth	- 4	adifications from specified reference methods	to improve performance

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

### **Test Method References:**

ALS Test Code Matrix	Test Description	Method Reference**
	•	

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

www.alsenviro.com

ANALYTICAL CHEMISTRY & TESTING SERVICES

SEND REPORT TO:



Vancouver BC, 1988 Triumph 5 Fort St. John BC, Box 256, 985 Grand Prairie AB, 9595 - 111 S Fort McMurray AB, Bay 1, 245 Edmonton AB, 9936 - 67th Ave Calgary AB, Bay 7, 1313 - 44th Saskatoon SK, 819 - 58th Stree



L2216097-COFC

\_Yes \_\_\_No \_\_\_N/A

Frozen?

\_Yes \_

\_No

CHAIN OF CUSTODY FORM

17-2311 : 403-291-0298

513-2191

**-668-83**83

#### ATTN: PATRICK MAJER FERNIE ALPINE RESORT UTILITIES CORPORATION ANALYSIS REQUESTED: COMPANY: 1505 - 17TH Avenue South East ADDRESS: POSTAL CODE: T2T 0E2 PROV: ALBERTA CALGARY CITY: SAMPLER: Hungry Baytaluke 1 - 800 - 258 - 7669 FAX: 403 - 244 - 3774 TEL: F A R U C - Fall 2018 EMS wk # 5 QUOTE NO: PROJECT NAME AND NO. ALS CONTACT: Nancy Sonompil@ALSGlobal.com PO NO.: @skircr.com $\mathbf{X}$ R Coliforms REPORT FORMAT: $\boxtimes$ П ۰ N-SON NH3-N NO2-N WO# ۵. DATE / TIME COLLECTED BODS ottio Fecal NOTES (sample specific Fotal 80 MATRIX SAMPLE IDENTIFICATION TSS comments, due dates, etc.) Æ YYYY-MM-DD TIME х 2019 - 1-2 14:00 Water х temp ≠ C WWTP Influent Routine С WWTP Influent BOD 1 2019 - 1-2 14:00 Water х emn a 5 х х х С 2019 - 1-2 14:15 Water temp ≈ WWTP Effluent Routine 4 х С WWTP Effluent BOD 2019 - 1 - 214:15 Water temp = х х С Ľ х X х WWTP Effluent Nutrient 2019 - 1-2 14:15 Water temp = С WWTP Effluent Bacti 2019 - 1-2 14:15 Water х temp = 'n FOR LAB USE ONLY х х temp = Ċ Elkriver Upstream Routine 2019 - 1- 2 14:30 Water С х х х 2019 - 1 - 214:30 х х temp = Elkriver Upstream Nutrient Water cх С Elkriver Upstream Bacti 14:30 temp = 2019 - 1-2 Water х х С 10 temp = Elkriver Outfall Routine 2019 - 1-2 14:45 Water с х х х х х temp = 2019 - 1-2 14:45 Water Elkriver Outfall Nutrient 11 С V 14:45 х temp = Elkriver Outfall Bacti 2019 - 1-2 Water 13 Х С Elkriver downstream Routine 2019 - 1-2 15:00 Water х temp = 14 5 С X X хI х х temp = Elkriver downstream Nutrient 2019 - 1-2 15:00 Water レ с 14 15:00 Water Х temp = Elkriver downstream Bacti 2019 - 1-2 2019-1-2 2 SPECIFY DATE: RELINQUISHED BY: DATE: RECEIVED BY DATE: ۲ (surcharge may apply) TURN AROUND REQUIRED: 5:00 pm e:40 Hungry Baytaluke TIME: TIME: DATE: RECEIVED BY: SEND INVOICE TO: RELINQUISHED BY: DATE: X INVOICE FORMAT: TIME: TIME: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO FOR LAB USE ONLY SPECIAL INSTRUCTIONS: wastewater@skifernie.com Sample Temperature: 70°C Cooler Seal Intact? Cooling Method?

### 153-6700

PAGE

OF

\_lce

None



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 10-JAN-19 Report Date: 17-JAN-19 15:39 (MT) Version: FINAL

Client Phone: 800-258-7669

# Certificate of Analysis

Lab Work Order #: L2218795 Project P.O. #: NOT SUBMITTED Job Reference: F A R U C - FALL 2018 EMS WK # 6 C of C Numbers: Legal Site Desc:

Justine Buma-a Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HUNGRY BAYTALLIKE on 09-14N-19 @	14:00						
Matrix: WATER	14.00						
Maux. WATER Miscellaneous Parameters							
Biochemical Oxygen Demand	98		75	ma/L		10-JAN-19	R4448890
Total Suspended Solids	180	DLHC	9.0	ma/L		12-JAN-19	R4443411
pH	7.46		0.10	рН		16-JAN-19	R4450012
1 2218795-2 WWTP EFELUENT							
Sampled By: HUNGRY BAYTALUKE on 09-JAN-19 @	14:15						
Matrix: WATER	-						
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		15-JAN-19	R4449308
Biochemical Oxygen Demand	<2.0		2.0	mg/L		10-JAN-19	R4448890
Chemical Oxygen Demand	11		10	mg/L		14-JAN-19	R4446389
Orthophosphate-Dissolved (as P)	0.113		0.010	mg/L		11-JAN-19	R4441769
Coliform Bacteria - Fecal	<1		1	CFU/100mL		10-JAN-19	R4441760
Nitrate (as N)	27.8	DLHC	0.10	mg/L		10-JAN-19	R4441548
Nitrite (as N)	<0.050	DLHC	0.050	mg/L		10-JAN-19	R4441548
Phosphorus (P)-Total	0.132		0.020	mg/L	16-JAN-19	17-JAN-19	R4452507
Total Suspended Solids	<3.0		3.0	mg/L		12-JAN-19	R4443411
рН	7.86		0.10	рН		16-JAN-19	R4450012
L2218795-3 ELKRIVER UPSTREAM							
Sampled By: HUNGRY BAYTALUKE on 09-JAN-19 @	14:30						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		15-JAN-19	R4449308
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		11-JAN-19	R4441769
Coliform Bacteria - Fecal	8		1	CFU/100mL		10-JAN-19	R4441760
	1.66		0.020	mg/L		10-JAN-19	R4441548
Nitrite (as N)	<0.010		0.010	mg/L	16 1411 10	10-JAN-19	R4441548
Total Suspended Solids	<0.020		0.020	mg/L	16-JAN-19	17-JAN-19	R4452507
nH	<3.0		3.U 0.10	nig/L		12-JAN-19 16- JAN-19	R4443411
	0.51		0.10	pri		10 0/11 10	1(4430012
Sampled By: HUNGEV BAYTALLIKE on 00 JAN 10 @	11.15						
Motrix: WATER	14.45						
Maulta WATER Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		15-JAN-19	R4449308
Orthophosphate-Dissolved (as P)	0.012		0.010	mg/L		11-JAN-19	R4441769
Coliform Bacteria - Fecal	1		1	CFU/100mL		10-JAN-19	R4441760
Nitrate (as N)	0.049		0.020	mg/L		10-JAN-19	R4441548
Nitrite (as N)	<0.010		0.010	mg/L		10-JAN-19	R4441548
Phosphorus (P)-Total	<0.020		0.020	mg/L	16-JAN-19	17-JAN-19	R4452507
Total Suspended Solids	<3.0		3.0	mg/L		12-JAN-19	R4443411
рН	8.15		0.10	pН		16-JAN-19	R4450012
L2218795-5 ELKRIVER DOWNSTREAM							
Sampled By: HUNGRY BAYTALUKE on 09-JAN-19 @	15:00						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		15-JAN-19	R4449308
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		11-JAN-19	R4441769

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2218795-5 ELKRIVER DOWNSTREAM Sampled By: HUNGRY BAYTALUKE on 09-JAN-19 @ Matrix: WATER	15:00						
Coliform Bacteria - Fecal Nitrate (as N) Nitrite (as N) Phosphorus (P)-Total	5 1.62 <0.010 <0.020		1 0.020 0.010 0.020	CFU/100mL mg/L mg/L mg/L	16-JAN-19	10-JAN-19 10-JAN-19 10-JAN-19 17-JAN-19	R4441760 R4441548 R4441548 R4452507
Total Suspended Solids pH	<3.0 8.32		3.0 0.10	mg/L pH		12-JAN-19 16-JAN-19	R4443411 R4450012

### Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Raise	d: Dilution required due to high concentration c	of test analyte(s).
MS-B	Matrix Spike recovery	could not be accurately calculated due to high	analyte background in sample.
Test Method R	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand dissolved oxyger BOD (CBOD) is	carried out using procee (BOD) are determined n meter. Dissolved BOE determined by adding a	dures adapted from APHA Method 5210B - "Bi by diluting and incubating a sample for a spec D (SOLUBLE) is determined by filtering the sar a nitrification inhibitor to the diluted sample price	ochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a nple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
COD-T-COL-CL	Water	Chemical Oxygen Demand (COD)	APHA 5220 D Colorimetry
The Chemical O contain a premix dichromate. The Oxidizable organ measured colorn into the linear rat	xygen Demand (COD) ed volume of reagents. COD reagents also con ic compounds react, re netrically and a decreas nge.	test is used to estimate the amount of organic The sample is then heated for two hours on the ntain silver and mercury ions. Silver is used as iducing the dichromate ion to green chromic io se in absorbance at 420 nm is proportional to t	matter in the water. The sample is added to COD tubes, which ne COD reactor with a strong oxidizing agent, potassium a catalyst and mercury is used to complex chloride interference. n. For samples in the 10 - 150 mg/L range the remaining Cr6+ is he COD. Samples with concentrations > 150 mg/L can be diluted
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is o Coliform bacteria involves an initia bacteria (Fecal)	carried out using procee a is enumerated by cult I 24 hour incubation at and is used for non-turk	dures adapted from APHA Method 9222 "Mem uring and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriate bid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". Jume is filtered through a 0.45 micron membrane filter. The test e growth medium. This method is specific for thermotolerant
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is o of Chemistry, "Fl al.	carried out, on sulfuric a low-injection analysis w	acid preserved samples, using procedures moving the determination in the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination for the determination f	dified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society n of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion Cl	nromatography with conductivity and/or UV de	tection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion Cl	nromatography with conductivity and/or UV det	lection.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is o persulphate dige	carried out using proced stion of the sample.	dures adapted from APHA Method 4500-P "Ph	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determined hold time from time	d in the laboratory using me of sampling (field ar	a pH electrode. All samples analyzed by this nalysis is recommended for pH where highly a	method for pH will have exceeded the 15 minute recommended ccurate results are needed)
PO4-DO-COL-EI	D Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using procee on a sample that has b	dures adapted from APHA Method 4500-P "Ph een lab or field filtered through a 0.45 micron	osphorus". Dissolved Orthophosphate is determined membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is ( (TSS) are detern	carried out using procee nined by filtering a sam	dures adapted from APHA Method 2540 "Solid ple through a glass fibre filter, and by drying th	s". Solids are determined gravimetrically. Total suspended solids the filter at 104 deg. C.
** ALS test metho	ds may incorporate mo	difications from specified reference methods to	o improve performance.
The lest two lett			and disclosure have been to the list holes.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

### **Test Method References:**

ALS Test Code	Matrix	Test Description	Method Reference**
---------------	--------	------------------	--------------------

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



SEND DEDODT TO.

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 Prairte 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 485, 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, Tol: 306-688-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

### CHAIN OF CUSTODY FORM

004		FERNIE AL	INE RESORT	UTILITIES	CORPO	RATION		PATRICK MAJER	AN/	ALYS	SIS F	REQI	JE\$T	ED:					_						
LDE	FANT:	1505 - 17TH	Avenue South	Fast				l =																	
ADD	RESS:					та		T2T 0E2	-																l
CITY	-	LI POD OS	9 7660	PROV:	402 0		POSTAL CODE:	Hungry Baytaluke																	
TEL:		1 - 600 - 25		FAX:	1403 - 24	14 - 3//4	SAMPLER:		-																
PRO.	JECT NAME A		FARUG-F	BR 2018 EM	l∋wrk#16 	· · · · · · · · · · · · · · · · · · ·	QUOTE NO:		-																
PO N	IO.:	<u>ا</u> ــــــــــ		ALS CO	NTACT:	Nancy Sonompi	I@ALSGIODAI.CO		-																
				1 /	⊠	- I\/I <i>/</i>	<u>pruaje to skiro</u>		_ ۽																
					<b>—</b>	$\boxtimes$			olifor								DS								
<u> </u>	WO#	<b> </b>				DATE / TIME	COLLECTED		<u>ه</u> [			Ъ	d F	Z E	N-E	2-2							OTES (sa	mple sp	ecific
		SAMPLE IDENTIFICATION			YYYY-MM-DD			Fec	TSS	F	ð	Tot	NHS	Öz	ğ	BÖ	Ö				°	ommenta, du	ie dates	, etc.)	
		WWTP Influ	ent Routine			2019 - 1-9	14:00	Water	Т	X	X											tem	<u>)</u> = 7	0	7 c
	1-	WWTP Influ	ent BOD		2	<u>,</u> 2019 – 1– 9	14:00	Water	1								х					tem	<u>)/ = (</u>	<u></u>	) <u>c</u>
		*				· · · · ·			1			Γ													
		WWTP Efflu	ent Routine		3	2019 - 1-9	14:15	Water	·	x	x							X				tem	p =		С
	<u>n</u>		ent BOD		Ĩ	2019 - 1- 9	14:15	Water				<b> </b>	1				X					tem	= 1c	21	с
	$\left  \left  \left  \right  \right $		ent Nutrient	-	7	2019 - 1-9	14:15	Water	-			x	x	x	x	x						tern	p = 1"	11	С
		VAAA/TD CFR.	ent Bacti		1/2	2019 - 1- 9	14.15	Water	×													tem	p=1/	$\sim$	с
×	`				_ <u></u>																				
F		Elkriver Uns	tream Routine		-1	2019 - 1-9	14:30	Water	-	x	x	<u> </u>	· ·									tern	p =	. 1	с
л С Ц	-2-	Elkriver Uos	tream Nutrient		C7	2019 - 1- 9	14:30	Water			1	x	X	x	x	×	<u> </u>				$\neg$	tem	p= /~	Ų	/ ¢
ы Б	$\vdash$	Elkriver Ups	tream Bacti		-ध-	2019 – 1– 9	14:30	Water	×	-	ŀ		1									tern	p= [/	1	С
ا ک	<b>⊢</b> ∽́−-	1			ţ										<u> </u>								. स्	1	
Ŀ,		Elkriver Out	fall Routine	·	10	2019 - 1- 9	14:45	Water		x	X											tem	p = _	17	Ċ
		Elkriver Ou	utfall Nutrient		11_	2019 - 1- 9	14:45	Water				X	X	X	х	x						tern	p = /	ĽĻ,	<u>, c</u>
		Elkriver Out	fall Bacti		12	2019 - 1-9	14:45	Water	X								ļ	Į	<u> </u>			tem	<u>p= V</u>	<u>- Y</u>	<u> </u>
ŀ													1_			<b> </b>	l	<u> </u>	1						
	1/	Elkriver dow	instream Routi	ne	13,	2019 - 1- 9	15:00	Water		X	X											tem	p = _/	)	<u>, c</u>
	1	Elkriver dow	nstream Nutrie	ant	14	2019 - 1- 9	15:00	Water				X	x	X	x	X						terr	p = ∥ /		<u> </u>
	7	Elkriver dow	vnstream Bacti		15	2019 – 1– 9	15:00	Water	×		2								L			terr	p=	ر ر	<u> </u>
	<u>_</u>																								<u></u>
				φ	R	SPECIFY DATE		(surcharge may apply)			REL	INQU	ISHE	BY:		<u> _</u>	DATE	20	19-1	- 9	RECE	IVED BY:	DATE	1	10
T <sup>UR</sup>	IN AROUND F	KEQUIKED:		<b>~</b> /	• •				_		Hur	igry E	laytal	uke			TIME:	:	5:0	0 pm	4	1º	ТІМЕ	<u></u>	1:00
ŞEN	ID INVOICE T	0:		ΔΤ		JTF		K F			REL	INQU	ISHE	BY:			DATE	:			RECE	IVED BY:	DATE	:	
INV	OICE FORMA	т:	▏▫┣━┫	Ζ.	• <b> </b> -		F								<u> </u>		TIME:	:					TIME	:	
SPE	CIAL INSTRU	JCTIONS:	PLEASE FAX	A COPY (	OF THE P	RESULTS TO 25	0-423-4652 OR	E-MAIL TO			FO	RLA	BUS	SE O	NLY					0					
1			wastewater@	skitemie.co	om						Coo	er Se	eal Inta	ncl?		Sam	ple To	emper ve	ature: «	No	°C	Cooling N	lethod?	P	None
1											I	Yes .	NC	·	N/A	I Froz	enr_		<u> </u>	110		<u> </u>	<u></u>	` —	

٠

PAGE

OF



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 25-MAY-18 Report Date: 06-JUN-18 17:32 (MT) Version: FINAL

Client Phone: 403-254-7669

# Certificate of Analysis

Lab Work Order #: L2100515 Project P.O. #: NOT SUBMITTED Job Reference: FERNIE ALPINE RESORT - MONTHLY EMS C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: Hungry Baytaluke on 23-MAY-18 @ 14:0	0						
Matrix: Water							
Miscellaneous Parameters							
Biochemical Oxygen Demand	62	DLHC	20	mg/L		26-MAY-18	R4064400
Total Suspended Solids	75.2	DLHC	4.0	mg/L		29-MAY-18	R4062473
рН	8.20		0.10	рН		05-JUN-18	R4073647
L2100515-2 WWTP EFFLUENT							
Sampled By: Hungry Baytaluke on 23-MAY-18 @ 15:0	0						
Matrix: Water							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		06-JUN-18	R4072570
Biochemical Oxygen Demand	<2.0	DUUG	2.0	mg/L		26-MAY-18	R4064400
Coliform Postoria - Facel	0.166	DLHC	0.010	mg/L		26-MAY-18	R4056769
Decementer (P) Total	1		1	mc/l	21 MAV 40		R4057944
Thusphulus (P)-100al Total Suspended Solids	0.382		0.020	mg/L	31-IVIA1-18	01-JUN-18	R4064323
	<3.0		3.0	nig/L		29-IVIA 1-10	R4062473
NO2 NO3 and Sum of NO2/NO3	0.00		0.10	рп		05-3010-16	R4073047
Nitrate in Water by IC							
Nitrate (as N)	35.7	DLHC	0.10	mg/L		26-MAY-18	R4061674
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	35.7		0.11	mg/L		29-MAY-18	
Nitrite in Water by IC			0.050	ma/l		26 MAV 19	P4061674
	<0.050	DEITO	0.050	ing/∟		20-101A 1 - 10	R4001074

### Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Raise	d: Dilution required due to high concentration of	test analyte(s).
MS-B	Matrix Spike recovery	could not be accurately calculated due to high	analyte background in sample.
Test Method Re	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand dissolved oxyger BOD (CBOD) is	carried out using proce (BOD) are determined n meter. Dissolved BOI determined by adding a	dures adapted from APHA Method 5210B - "Bio by diluting and incubating a sample for a specif O (SOLUBLE) is determined by filtering the sam a nitrification inhibitor to the diluted sample prior	chemical Oxygen Demand (BOD)". All forms of biochemical ied time period, and measuring the oxygen depletion using a ple through a glass fibre filter prior to dilution. Carbonaceous • to incubation.
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is o Coliform bacteria involves an initia bacteria (Fecal)	carried out using proce a is enumerated by cult I 24 hour incubation at and is used for non-turl	dures adapted from APHA Method 9222 "Memb uring and colony counting. A known sample vol 44.5 degrees C of the filter with the appropriate bid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". ume is filtered through a 0.45 micron membrane filter. The test growth medium. This method is specific for thermotolerant
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is o of Chemistry, "Fl al.	carried out, on sulfuric a ow-injection analysis w	acid preserved samples, using procedures mod ith fluorescence detection for the determination	ified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with conductivity and/or UV dete	ection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with conductivity and/or UV dete	ection.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is o persulphate dige	carried out using proce stion of the sample.	dures adapted from APHA Method 4500-P "Pho	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determined hold time from til	d in the laboratory using me of sampling (field a	g a pH electrode. All samples analyzed by this n nalysis is recommended for pH where highly ac	nethod for pH will have exceeded the 15 minute recommended curate results are needed)
PO4-DO-COL-CI	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using proce on a sample that has b	dures adapted from APHA Method 4500-P "Pho peen lab or field filtered through a 0.45 micron m	osphorus". Dissolved Orthophosphate is determined nembrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is a (TSS) are detern	carried out using proce nined by filtering a sam	dures adapted from APHA Method 2540 "Solids ple through a glass fibre filter, and by drying the	". Solids are determined gravimetrically. Total suspended solids e filter at 104 deg. C.
** ALS test metho	ds may incorporate mo	difications from specified reference methods to	improve performance.
The last two lette	ers of the above test co	de(s) indicate the laboratory that performed ana	alytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
---------------	--------	------------------	--------------------

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review. **ALS Environmental** 

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toil Free: 1-800-665-0243 Fax: 604-253-6700 Fort SL John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587 Grand Prairie AB, 9595 - 111 Street, T8V SW1, Tel: 780-539-5196 Toil Free: 1-800-668-9878 Fax: 7 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 485, Tel: 780-791-1524 Fax: 780-791-1586 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toil Free: 1-800-668-9878 Fax: 78 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toil Free: 1-800-668-9878 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toil Free: 1-800-667-7645 Fax:



L2100515-COFC

### CHAIN OF CUSTODY FORM

SEN	D REPORT TO	): 						1									_	-							
сом	PANY:	ANY: FERNIE ALPINE RESORT UTILITIES CORPORATION					PATRICK MAJER		ALYS	SIS R	EQU	EST	ED:	<u></u> -т							<b>-</b> T	-1-	-7		1
	RESS:	2559 - 29TH	Street North E	ast				-														4	. hi	1.+	
CITY	:	CALGARY		PROV: ALBER	TA	POSTAL CODE:	T2T 0E2	4				1										110		M	
TEL:		403 - 256 -	8473	FAX: 403 - 2	44 - 3774	SAMPLER:	Hungry Baytaluke	_														Йì	N		
PRO	JECT NAME A	ND NO .:	Femie Alpine	Resort - Monthly EN	AS	QUOTE NO:		_							1								1	1 -	
PON	IQ.:			ALS CONTACT:	Lydmyla Shvets	@ALSGlobal.com	m	_	İ										i		·	fer	$\sim p$	,	1
	-				- 1\/L/	<u>p naje t@skirc</u>	r.com	- 1 g														0	1.8	$\sim$	
REP	ORT FORMAT	r:						14 Line	1				ļ					ļ				1	<u>· Y</u>		
	WO#	T				COLLECTED		<b>−</b>   <sup>8</sup> / <sub>■</sub>			9 0	<u>ط</u>	z	z	z	ß					ſ	NOTE	- ES (sampl	le specific	
			SAMPLE IDENTIF	FICATION	YYYY-MM-DD	TIME	MATRIX	Ц Ц Ц Ц	1SS	E	15	Tota	СH N	ο̈́ν	SON.	<u>S</u>	ö					comme	snts, due d	lates, etc.)	
-		WWTP Infl	uent Routine 50	10 ml /	2018 - 5 - 23	14:00	Water		X	X										_	$\square$		24	ve	1
	- <del>-</del>	WWTP Infl	uent BOD 1 litr	e 2	2018 - 5 - 23	14:00	Water		1							x						_/_	<u> 7- 0</u>		1
		WWTP Eff	uent Routine 5	00 mi <u>3</u>	2018 - 5 - 23	15:00	Water		x	X											_[`		<u> </u>		1
		WWTP Eff	uent BOD 500	ml 4	2018 - 5 - 23	15:15	Water									Х				_	$\square$	<u> </u>	4	<u>100</u>	4
	┠────━─	WWTP Eff	uent Nutrients	250 ml + H2SO4 5	2018 - 5 - 23	15:30	Water	1-			X	х	х	х	х							$\square$	<u> </u>	<u> </u>	_
		WWTP Eff	luent Bacteriolo	gical 250 ml	2018 - 5 - 23	15:45	Water	×														1_			
					<u> </u>																				
≻																									
ź		<u> </u>																							
ш				-	<u> </u>																				
۱ <u>۶</u>						-							[							<u>а</u> т					
l₹																									
ក្រ			٨.			_																			
[	<u> </u>									1		-													
1				• · · · ·								1													
													Î												
						<u>+</u>				-					1										
									+	1	<u> </u>														
Ļ		+						-			1														
									+			<u> </u>	-	1		1		1	-						
┝		.1				_ <u></u>	(surcharge may apply)			REL	INQUI	, ISHED	BY:	<u>.</u>		DATE:	201	8 - 5	- 23	REĈE	IVED	BY:	DATE:		
τu	RN AROUND	REQUIRED:			SPECIFIC DATE					HUI	VGRY	BAY	TALL	JKE		TIME:		5:0	)0 pm			_	TIME:		
SF				THI			RE			REL	INQU	ISHE	D BY:			DATE:				RECI	EIVED	BY:	DATE	03/25/	2pu
					- ~ -								1	TIME:					1/2	2-	TIME:	9:19			
SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO							E-MAIL TO			FO	R LA	BUS	SE O	NLY	<u> </u>				10						
SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-443-40 wastewater@skifemie.com										Coo	ler Se	ai Inta	act?		Sam	iple Te	emper	ature:	<u>to</u>	°C	Coolir	ng Metho	>d?	Mart	
											Yes	N<	)	N/A	Froz	:en?	Ye	5	NO			epacks	IC0	None	



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 27-JUL-18 Report Date: 10-AUG-18 16:06 (MT) Version: FINAL

Client Phone: 403-254-7669

## Certificate of Analysis

Lab Work Order #: L2137279 Project P.O. #: NOT SUBMITTED Job Reference: FERNIE ALPINE RESORT-MONTHLY EMS C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS** RIGHT PARTNER

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
1 2137270-1 W/W/TP INFLUENT							
Sampled Bv: HB on 26-JUL-18 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	86	DLHC	20	mg/L		27-JUL-18	R4153954
Total Suspended Solids	167	DLHC	5.0	mg/L		01-AUG-18	R4154513
рН	7.86		0.10	рН		04-AUG-18	R4160231
L2137279-2 WWTP EFFFLUENT							
Sampled By: HB on 26-JUL-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		10-AUG-18	R4163175
Biochemical Oxygen Demand	<2.0		2.0	mg/L		27-JUL-18	R4153954
Ortnopnosphate-Dissolved (as P)	0.225		0.0050	mg/L		28-JUL-18	R4146467
Collorm Bacteria - Fecal	9		1	CFU/100mL		27-JUL-18	R4148087
Thospholus (P)-100al	0.305	DLILC	0.050	mg/L			R4154368
nutai Suspenueu Sulius	<3.0		3.0	nng/∟			R4154513
NO2. NO3 and Sum of NO2/NO3	7.90		0.10	μΠ		04-AUG-10	174100231
Nitrate in Water by IC							
Nitrate (as N)	18.1		0.020	mg/L		27-JUL-18	R4151389
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	18.1		0.050	mg/L		31-JUL-18	
Nitrite in Water by IC	-0.010		0.010	ma/l		27 11 1 19	D4151280
	<0.010		0.010	ing/∟		27-JUL-10	K4131369

### Sample Parameter Qualifier Key:

Qualifier Descripti	on								
DLHC Detection	Limit Raised	d: Dilution required due to high concentration of t	est analyte(s).						
Test Method References	5:								
ALS Test Code	Matrix	Test Description	Method Reference**						
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode						
This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.									
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D						
This analysis is carried out Coliform bacteria is enume involves an initial 24 hour in bacteria (Fecal) and is used	using procect rated by cultu ncubation at 4 d for non-turb	lures adapted from APHA Method 9222 "Membrauring and colony counting. A known sample volue 44.5 degrees C of the filter with the appropriate goid water with a low background bacteria level.	ane Filter Technique for Members of the Coliform Group". me is filtered through a 0.45 micron membrane filter. The test growth medium. This method is specific for thermotolerant						
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION						
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC						
This analysis is carried out, of Chemistry, "Flow-injection al.	on sulfuric a n analysis wi	acid preserved samples, using procedures modified the fluorescence detection for the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determination of the determin	ied from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of trace levels of ammonium in seawater", Roslyn J. Waston et						
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)						
Inorganic anions are analyz	ed by Ion Ch	nromatography with conductivity and/or UV detection	ction.						
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)						
Inorganic anions are analyz	ed by Ion Ch	nromatography with conductivity and/or UV detection	stion.						
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS						
This analysis is carried out persulphate digestion of the	using procec e sample.	lures adapted from APHA Method 4500-P "Phos	phorus". Total Phosphorus is determined colourimetrically after						
PH-CL	Water	рН	APHA 4500 H-Electrode						
pH is determined in the lab hold time from time of sam	oratory using pling (field ar	a pH electrode. All samples analyzed by this malysis is recommended for pH where highly accurate	ethod for pH will have exceeded the 15 minute recommended urate results are needed)						
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS						
This analysis is carried out colourimetrically on a samp	using procec le that has b	lures adapted from APHA Method 4500-P "Phos een lab or field filtered through a 0.45 micron me	phorus". Dissolved Orthophosphate is determined embrane filter.						
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric						
This analysis is carried out (TSS) are determined by fil	using procec tering a sam	lures adapted from APHA Method 2540 "Solids" ple through a glass fibre filter, and by drying the	. Solids are determined gravimetrically. Total suspended solids filter at 104 deg. C.						
** ALS test methods may inc	orporate mo	difications from specified reference methods to i	mprove performance.						
The last two letters of the a	bove test coo	de(s) indicate the laboratory that performed anal	ytical analysis for that test. Refer to the list below:						
Laboratory Definition Cod	le Labor	atory Location							
CL	ALS E	NVIRONMENTAL - CALGARY, ALBERTA, CAN	IADA						
Chain of Custody Number	's:								

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
---------------	--------	------------------	--------------------

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review. **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, 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, T9R 485, 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

|--|

END	REPORT	PORT TO:			·												1									
OMP	ANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION			ATION	ATTN:	PATRICK MAJER		ALYS		EQU	ESTE	ED: 1	<del></del>					<u> </u>	ТТ	<u></u>	<u> </u>		1		
DDR	ESS:		2559 - 29TH	Street North E	ast					4													Ar	نملمه	nt	L
ITY:		-	CALGARY		PROV: 4	ALBERT	A .	POSTAL CODE:	T2T 0E2	4						1	1					1	/ u	.1.01	en i	Φ
EL:			403 - 256 - 8	3473	FAX: 4	403 - 244	4 - 3774	SAMPLER:	Hungry Baytaluke													Ì	t '	$\mathcal{D}$	5 °C	_
Femie Alpine Resort - Monthly EMS		5	QUOTE NO:																24	$\mathcal{O}$ -						
ALS CONTACT: Lydmyla Shvi			ydmyla Shvets(	@ALSGlobal.com	n														l			1				
		l					<u> </u>	pinajer@skirc	r.com					1		]						1				
REPORT FORMAT:									1																	
									<u> </u>	- 3	1		٩	_	z	z	z	ا م						ES /rem	olo opecific	1
WO# SAMPLE IDENTIFICATION		-	DATE / TIME	COLLECTED	MATRIX	eca	SS	r	ortho	<b>Ba</b>	ξļ	ŝ	ğ	BOB	8				comm	ients, due	dates, etc.)					
r		_			- • •		YYYY-MM-DD		Water	<u> </u>		_ <u>∩</u>		<u> </u>	<u>-</u>	~		<u> </u>	<u> </u>			+	· ·	11	50	1
		_[]	WWTP Influent Routine 500 ml I WWTP Influent BOD 1 litre 2			Ŀ	2018 - 7 - 26	14:00	vvater	_	+^-	<u> </u> ^						$\overline{\mathbf{v}}$		-+-		+	-t	- <u>T</u> *	5	-
	<u> </u>	1				2018 - 5 - 26	14:00	Water								-				_	┼──╂				-	
		Ó	WWTP Eff	ent Routine	500 ml	3	2018 - 5 - 26	15:00	Water		<u> ×</u>					-+		$\overline{}$				┼╼┨	<u> </u>	$\overline{175}$	, <del>1</del>	-
	2	Σ	WWTP Eff	uent BOD 500	ml	4	2018 - 5 - 26	15:15	Water		-				<u> </u>	_	<u>.</u> +	-+		+			┝──┦	Ľ4-	+-	-
		Π	WWTP Effluent Nutrients 250 ml + H2SO4			i04ζ	2018 - 5 - 26	15:30	Water				<u>×</u>	X	<u>×</u>	X	<u> </u>				_	+-	<u> </u>		<u> </u>	-
Ī		$\mathcal{T}$	WWTP Eff	- uent Bacteriok	ogical 250 ml	6	2018 - 5 - 26	15:45	Water	×		<u> </u>						_			_					
ľ						_									'				_				<b>_</b>			-
, Ì																										4
ž																										_
щ										- [																
Ĩ														_												
Ξl		_	÷ KIN			AR DAR ETA ETA ETA ETA ETA ETA ETA ETA ETA ETA						1														
OR OR			╊ <u></u> ╢║╢					۲				1	· ·				_	-			-		· ·			
Ľ		_	ŀ	L213	37279-CC	OFC		-		ŀ		+		'			-+		- 1							
			Ł						· · · · · · · · · · · · · · · · · · ·		+							- †								٦
			<u> </u>		- C. 1998-1					+	╉	+		<u> </u>		┝━┨			-+-	+		+	1		_	1
			<b> </b> _							+	+	-	-				-+					-	t			1
	_	_	<u> </u>				<u> </u>		<u> </u>			+	+			-+		+			+		<u>+</u>			-
			L						<b></b>				┥	<u> </u>		┝╼┤	- +						+	<u> </u>		-
									<u> </u>		+			Į	<u> </u>	<u> </u>						-+	╂───			-
							L					$\square$									_		┹╾╼	T	mt -	9
	KARAN A SPECIFY DATE: (surcharge may apply)			(surcharge may apply)			REL	INOU	ISHED	) BY:		D	ATE:	2018	- 5 - 2	26 RE		<u>2 вч:</u>	DATE:	42	A					
TUR	n arqui	ND F	œQUIRED:			- <b>`</b>						HU	NGRY	/ BAY	TALU	KE	T	IME:		5:00	pm -	1 <del>0</del> ,		TIME:	<u>40</u> 5	Ч
SEN		CE T	0:				TH	┝╾┝╼	ĸF			REL	INQU	ISHED	BY:		D.	ATE:			RE	CEIVED	D BY:	DATE:		_
INV	ICE FOR	RMA	T:	┐ <b>╻┣</b> ━┥		ò 🛏		ŀ				TIME: TIME:														
SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO		E-MAIL TO			FO	FOR LAB USE ONLY							4													
	wastewater@skifemle.com								Coo	oler Se	al Inta	ict?		Samp	ole Ter	iperatu	re: <u>\</u>	7_•¢	Cool	ing Meth	1067	None				
1												Yes	No	·1	N/A	Froze	<u></u> ?n	<u>Yes</u>		,	'	CODACKS	ICE	None		

PAGE

OF



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:17-AUG-18Report Date:11-SEP-18 17:09 (MT)Version:FINAL

Client Phone: 403-254-7669

## Certificate of Analysis

Lab Work Order #: L2148834 Project P.O. #: NOT SUBMITTED Job Reference: WASTEWATER-AUGUST 2018 MONTHLY EMS C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER** 

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2148834-1 WWTP INFI UFNT							
Sampled By: BC on 16-AUG-18 @ 16:15							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	149	DLHC	75	mg/L		18-AUG-18	R4181742
Total Suspended Solids	238	DLHC	9.0	mg/L		23-AUG-18	R4182478
рН	7.77		0.10	рН		07-SEP-18	R4205624
L2148834-2 WWTP EFFFLUENT							
Sampled By: BC on 16-AUG-18 @ 16:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050	DODD	0.050	mg/L		28-AUG-18	R4189000
Biochemical Oxygen Demand	4.1	BODP	2.0	mg/L		18-AUG-18	R4181742
Onnophosphate-Dissolved (as P)	0.184	DLHC	0.010	mg/L		18-AUG-18	R4176114
Comorni Dacteria - Fecal Discriburus (D) Total	b 0.005		1	CFU/TUUML		17-AUG-18	R41/624/
Thospholus (P)-Total Total Suspended Solids	0.295	DLHC	0.050	mg/L		24-AUG-18	R4183425
nul suspenueu sullus	<3.U 0.22		3.0	nig/L ກມ		23-AUG-18	R41024/0
NO2. NO3 and Sum of NO2/NO3	0.33		0.10	μΠ		01-327-10	114203024
Nitrate in Water by IC							
Nitrate (as N)	17.9	HTD	0.020	mg/L		31-AUG-18	R4202629
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	17.9		0.050	mg/L		05-SEP-18	
Nitrite in Water by IC	0.045	μтр	0.040			21 4110 19	D 4000000
	0.015	пір	0.010	mg/L		31-AUG-18	R4202629

#### Sample Parameter Qualifier Key:

Description

Our lifting

Q	uaimei	Description
B	ODP	BOD dilution results differed by more than 30% RPD. Precision of reported BOD result may be less than usual.
D	LHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
H.	TD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.

#### Test Method References: ALS Test Code Matrix Method Reference\*\* **Test Description** BOD-BC-CL Biochemical Oxygen Demand (BOD) Water APHA 5210 B-5 day Incub.-O2 electrode This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation. FCC-MF-CL Water Fecal Coliform Count-MF APHA 9222D This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level. N2N3-CALC-CL Water Nitrate+Nitrite CALCULATION NH3-F-CL Water Ammonia by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al. NO2-IC-N-CL Water Nitrite in Water by IC EPA 300.1 (mod) Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. NO3-IC-N-CI Water Nitrate in Water by IC EPA 300.1 (mod) Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. P-T-COL-CL Total P in Water by Colour **APHA 4500-P PHOSPHORUS** Water This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample. PH-CI Water APHA 4500 H-Electrode pН pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed) PO4-DO-COL-CL Water Diss. Orthophosphate in Water by Colour APHA 4500-P PHOSPHORUS This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

 TSS-CL
 Water
 Total Suspended Solids
 APHA 2540 D-Gravimetric

 This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids

(TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA
Chain of Custody Numbers:	

### Test Method References:

ALS Test Code Matrix Test Description	Method Reference**
---------------------------------------	--------------------

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

### ALS Environmental

ANALYTICAL CHEMISTRY & TESTING SERVICES

SEND REPORT TO:



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tet: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700 Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tet: 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: 306-668-8833

CHAIN OF	CUSTODY P	ORM

сом	PANY:	FERNIE ALP	INE RESORT	UTILITIES CORPC	RATION	ATTN: PATRICK MAJER ANA					ANALYSIS REQUESTED:													
	ESS	1505 - 17TH	AVENUE SOU	TH WEST		<u>.                                    </u>										1				T	Т			
		CALGARY		PROV: ALBER	RTA	POSTAL CODE:	T2T 0E2	1																
TEI		403 - 256 - 8	473	FAX: 403 - 2	44 - 3774	SAMPLER:	Bo Choroszewski								]									
PRO			Wastewater -A	ugust 2018 Monthi	y EMS	QUOTE NO:																		
PON	0.:			ALS CONTACT:	Nancy Sonompi	<u> </u>												1						ĺ
		·			- 1/ //	p naje @skirc	r,com	"												1				
REPC	ORT FORMAT			·····	」∖∕Ⅰ♪ ⋈∟♪	┈╼╅╶┇╷═╶═ ┌┐ <mark>╏</mark> ╴ <mark>┣</mark>		form																
	WO#	<u>ا</u>						<u>ة</u> [-			6	<u> </u> _	z	z	ą	اير					F	NOTES (***	noie soeriiir	
		S.	AMPLE IDENTIF	ICATION		TIME	MATRIX	ecal	TSS	<u>_</u>	Ē	Total	NH3	NO3	N N N	<u>8</u>	5			1		comments, du	e dates, etc.)	_
T		WWTP Infin	ent Routine		2018-08-16	16-15	Water	╧	†×	×	Ē								Í			12.80	C-	_
_		WWTP Influ	ent BOD	<u>-</u>	2018-08-16	16:15	Water	1-	1	<b> </b>		1				х						12.8 0		
ŀ		WWTP Efflu	ent Routine		2018-08-16	16:30	Water	$\top$	X	X												18.90		_
ŀ		WWTP Efflu	ent BOD	·	2018-08-16	16:30	Water									х						18.90	2	
ŀ		WWTP Efflu	ent Nutrients		2018-08-16	16:30	Water				X	X	X	X	х						ľ	18.7	<u>'د</u>	
ľ	·······	WWTP Efflu	ent Bacteriolog	lical	2018-08-16	16:30	Wate.	X	ľ.													18.20	(	
			·····											Ŀ										_
<u>-</u>									$\perp$					ļ										
No.												1						L						
JSE									<u> </u>		Ļ	<b> </b>	ļ											
₩ ₩		-	-	-				_	<u> </u>				<u> </u>	<u> </u>			ļ	ļ						
цЧ									1	<u> </u>	<u> </u>		<u> </u>	<u> </u>	<u> </u>		L	<b>i</b>						
<u>ନ</u> ୍ଦ୍ର		<u> </u> :       <b>  </b>					<u> </u>		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<b> </b>					<b> </b>	╘╼┤	$\square$			
[		↓ "" <b>"</b>	L2148	3834-COFC			<u> </u>		_	<u> </u>	<u> </u>		_	<b> </b>					<b> </b>	<b> </b>				
1		1	, ,,			l 			<b>_</b>	-		<u> </u>	<b> </b>	<b> </b>				<u> </u>	$\vdash$		$ \rightarrow $			
ĺ		L			- <u> </u>	<u> </u>	<u></u>		<u> </u>	+	_	⊢	┢	<b> </b>			<b>_</b>			┝				
		<b>↓</b>				ļ			+	+		+	┨				ļ	╞_─				<u></u> ·		
		<u> </u>				<b></b>	<b></b>		+	4	+			<u> </u>			<u> </u>	┣──						
		<b></b>		<b></b>	<u> </u>		·		–	+				-				<b> </b>	<u> </u>		<b>\</b>	·		
Ш		<u> </u>	<del></del>			<u> </u>	<u> </u>			–	1	<u> </u>	<u> </u>		-	<u> </u>		<u> </u>	<u> </u>			<u>a</u> ]_	$\mathcal{A}$	-
TUR	N AROUND R	REQUIRED:	$  \bullet \mathbf{R}$	<b>( ) K</b>	SPECIFY DATE	`: 	_ (surcharge may apply)			REL		ISHEL	DBY:		<sup>-</sup>	DATE:			_	RECE			10//	11
L				71 11-1							kiand i	Match			-	rime;	<del>  ,</del>	2010	OR. 10	D.C.C.	<u>//C</u>		170	Ĥ
SEN		0:		₩Ľ!						REL	<u>овиј</u>	ROC'	J BY:	21/1	<del>  '</del>	JATE:		<u>(</u>	10	RECE	IVED		+	
		.T:				10423-4653-0P						BII			<u> </u>	TIME:		0.4	5	Ļ		TIME	<u> </u>	
wastewater@skifernie.com				REGULTS TO Z					. Coo	xler Se	al Inte	act?		Sam	ple Te	mper	ature:	$\mathcal{O}^{\dagger}$	°C	Cooli	ng Method?			
								YesNoN/A					Frozen?YesNotoepacks						epackslo	eNone	3			

PAGE

ÓF



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 26-OCT-18 Report Date: 03-NOV-18 13:14 (MT) Version: FINAL

Client Phone: 403-254-7669

## Certificate of Analysis

Lab Work Order #: L2187829 Project P.O. #: NOT SUBMITTED Job Reference: WASTEWATER-OCTOBER 2018 MONTHLY EMS C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Environmental 🕽

www.alsglobal.com

**RIGHT SOLUTIONS RIGHT PARTNER**
## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2187829-1 WWTP INFLUENT Sampled By: BC on 25-OCT-18 @ 14:00 Matrix: WATER Miscellaneous Parameters Biochemical Oxygen Demand Total Suspended Solids pH	39 61.0 8.06	DLHC	20 3.0 0.10	mg/L mg/L pH		26-OCT-18 28-OCT-18 30-OCT-18	R4308764 R4307596 R4308559
L2187829-2       WWTP EFFLUENT         Sampled By:       BC on 25-OCT-18 @ 14:15         Matrix:       WATER         Miscellaneous Parameters         Ammonia, Total (as N)         Biochemical Oxygen Demand         Orthophosphate-Dissolved (as P)         Coliform Bacteria - Fecal         Nitrate (as N)         Nitrite (as N)         Phosphorus (P)-Total         Total Suspended Solids	<0.050 <2.0 0.269 <1 <2.0 <1.0 0.380 <3.0	DLHC DLHC	0.050 2.0 0.0050 1 2.0 1.0 0.0050 3.0	mg/L mg/L CFU/100mL mg/L mg/L mg/L mg/L		02-NOV-18 26-OCT-18 27-OCT-18 26-OCT-18 27-OCT-18 29-OCT-18 28-OCT-18	R4314475 R4308764 R4302291 R4301986 R4305551 R4305551 R4305327 R4307596
рН	8.32		0.10	pΗ		30-OCT-18	R4308559

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

### **Reference Information**

#### Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Raise	d: Dilution required due to hig	h concentration of test analyte(s).
Test Method Re	ferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demai	nd (BOD) APHA 5210 B-5 day IncubO2 electrode
This analysis is c oxygen demand ( dissolved oxygen BOD (CBOD) is c	arried out using proce BOD) are determined meter. Dissolved BOI letermined by adding a	dures adapted from APHA Me by diluting and incubating a s O (SOLUBLE) is determined b a nitrification inhibitor to the di	thod 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical ample for a specified time period, and measuring the oxygen depletion using a y filtering the sample through a glass fibre filter prior to dilution. Carbonaceous luted sample prior to incubation.
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is c Coliform bacteria involves an initial bacteria (Fecal) a	arried out using proce is enumerated by cult 24 hour incubation at Ind is used for non-turk	dures adapted from APHA Me uring and colony counting. A 44.5 degrees C of the filter wi bid water with a low backgrou	thod 9222 "Membrane Filter Technique for Members of the Coliform Group". known sample volume is filtered through a 0.45 micron membrane filter. The test th the appropriate growth medium. This method is specific for thermotolerant and bacteria level.
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is c of Chemistry, "Flo al.	arried out, on sulfuric a ow-injection analysis w	acid preserved samples, using ith fluorescence detection for	g procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society the determination of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with conductiv	ity and/or UV detection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with conductiv	ity and/or UV detection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c persulphate diges	arried out using procestion of the sample.	dures adapted from APHA Me	thod 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
pH is determined hold time from tin	in the laboratory using ne of sampling (field a	g a pH electrode. All samples nalysis is recommended for p	analyzed by this method for pH will have exceeded the 15 minute recommended H where highly accurate results are needed)
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Wa	ater by Colour APHA 4500-P PHOSPHORUS
This analysis is c colourimetrically	arried out using proce on a sample that has b	dures adapted from APHA Me been lab or field filtered throug	thod 4500-P "Phosphorus". Dissolved Orthophosphate is determined h a 0.45 micron membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is c (TSS) are determ	arried out using proce ined by filtering a sam	dures adapted from APHA Me ple through a glass fibre filter	thod 2540 "Solids". Solids are determined gravimetrically. Total suspended solids and by drying the filter at 104 deg. C.
** ALS test method	ls may incorporate mo	odifications from specified refe	rence methods to improve performance.
The last two lette	rs of the above test co	de(s) indicate the laboratory t	hat performed analytical analysis for that test. Refer to the list below:
Laboratory Defir	ition Code Labo	ratory Location	
CL	ALS E	ENVIRONMENTAL - CALGAR	Y, ALBERTA, CANADA
Chain of Custod	y Numbers:		

### **Reference Information**

L2187829 CONTD.... PAGE 4 of 4 Version: FINAL

#### Test Method References:

ALS Test Code	Matrix	<b>Test Description</b>	Method Reference**
---------------	--------	-------------------------	--------------------

#### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review. **ALS Environmental** 

ANALYTICAL CHEMISTRY & TESTING SERVICES



www.alsenviro.com

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188. Toll Free; 1-800-565-0243. Fer: 604-253-6700

L2187829-COFC

#### CHAIN OF CUSTODY FORM

Fort St. John BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel: 250-261-55

Grand Prairie AB, 9595 - 111 Street, T8V 5W1, Tel; 780-539-5196 Toll Fr. Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 485, Tel: 780-791-1524 Edmonton AB, 9936 - 67th Avenue, T6E OP5, Tel: 780-413-5227 Toll Free

Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 1

Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Fr

SEND	REPORT TO																							
сом	PANY:	FERNIE ALF	PINE RESORT	UTILITIES CORPO	RATION	ATTN:	PATRICK MAJER	AN/	ALYS	SIS R	EQL	JEST	ED:									. <u> </u>		
ADDF	RESS	1505 - 17TH	AVENUE SOU	TH WEST																				
CITY:	:	CALGARY		PROV: ALBER	ТА	POSTAL CODE:	T2T 0E2																	
TEL:	_	403 - 256 - 8	3473	FAX: 403 - 24	44 - 3774	SAMPLER	Bo Choroszewski																	
PRO.	JECT NAME A	ND NO.:	Wastewater -C	ctober 2018 Month	IY EMS	QUOTE NO:																		
PO N	<b>O</b> .:			ALS CONTACT:	Nancy Sonompi																			
					- 1\/  /	<u>phajer@skirc</u>	r.com	5											1		1			
REPC	ORT FORMAT				RΨ			liforn																
	WO#				DATE / TIME	COLLECTED		ပီး			Чo	<u>a</u>	z	z	z	8					ľ	NOTES (r	ample	specific
		s	AMPLEIDENTIFI	ICATION	YYYY-MM-DD	TIME	MATRIX	Т С	TSS	툅	Ð	Tots	εHN	ÖN	Öz	BO	õ					comments, o	due dat	es, etc.)
	١	WWTP Influ	ent Routine		2018-10-25	14:00	Water		х	х												11.9 0	Č.,	
	Ē	WWTP Influ	ent BOD		2018-10-25	14:00	Water									x		_				11.9°C		
		WWTP Efflu	ent Routine		2018-10-25	14:15	Water		x	x												12 <sup>5</sup> C		
	7	WWTP Efflu	ent BOD		2018-10-25	14:15	Water	<b>[</b>	[							х				·		13°C		
		WWTP Efflu	ent Nutrients		2018-10-25	14:15	Water				X	×	х	х	х							13°C		
		WWTP Efflu	ent Bacteriolog	ical	2018-10-25	14:15	Water	х														13°C		
									1									[						
Σ							_																	
ð																								
ЫSL		İ																						
8		<b>i</b>		· · ·											_									
Ч С																								
6																								
ľ																								
		·																						
	··																						_	
·												1												
		<u> </u>			SPECIFY DATE:		(surcharge may apply)			REL	NQUI	ISHED	BY:		6	ATE:				RECE	EIVED	BY: DATE	: l0	26
TURI	N AROUND R	EQUIRED:					- 			Kirkl	and M	Match	im		7	TIME:					N		:	9:00
SEN	D INVOICE TO	): 					KF			REL	NQUI	ISHED	BY:		0	ATE:	2	018-1	0-25	REĆE		BY: DATE	<u>=</u>	
INVO	ICE FORMAT	r:	_ <b>}-1</b> '	Ζ``-		╞╴╵	_			80	сно	ROSZ	EWS	ĸ		IME:	- 14	<u>(:3</u>	0			, TIME	:	
SPEC		CTIONS:	PLEASE FAX	A COPY OF THE R	ESULTS TO 25	0-423-4652 OR	E-MAIL TO			FOF	R LA	BUŠ	EO	VLY									_	
		wastewater@skifemie.com					Cooler Seel Intact? Sample Temperature:9(						°C	Cooli	ng Method?	-0	None							

G:/QUAUTY/00\_DOCUMENTS/10\_AUTHORIZED/FORMS/CoC for ALS Plant EMS xis

م



## **Acute Toxicity Test Results**

Sample collected December 27, 2017

Final Report

January 9, 2018

Submitted to:

Fernie Alpine Resort Utilities Corportation Calgary, AB

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



#### **SAMPLE INFORMATION**

Sample ID/		Dates							
Internal ID	Collected	Received	Rainbow trout test initiation	temperature					
Wastewater/	27-Dec-17 at	28-Dec-17 at		2.015					
1718-0590	1645h	1035h	29-Dec-17 at 1345h	2.0°C					

#### **TEST TYPES**

Rainbow trout 96-h LC50 test

#### RESULTS

#### **Toxicity test results**

Sample ID	Rainbow trout LC50 (% v/v) [95% CL]	
Wastewater	>100 [NA]	

CL = Confidence Limit, LC = Lethal Concentration,

#### QA/QC

QA/QC summary	Rainbow trout
Reference toxicant LC50 (95% CL)	3.2 (2.5-3.9) g/L KCl <sup>1</sup>
Reference toxicant historical mean (2 SD Range)	3.0 (2.2-4.0) g/L KCl
Reference toxicant CV	9.6%
Organism health history	Acceptable
Protocol deviations	None
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

<sup>1</sup> Test date, December 12, 2017

LC = Lethal Concentration; CL = Confidence Limit



Harjot Sandhu

Report By: Harjot Sandhu, BSc Biologist

achtyn force

Reviewed By: Jacklyn Poole, BSc Laboratory Supervisor

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.



**APPENDIX A – Summary of test conditions** 



Test species	Oncorhynchus mykiss
Organism source	LSL Fish hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	22-L plastic pails with polyethylene liners
Test volume	20 L
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	CETIS version 1.9.0.8
Test endpoints	96-hour LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCI)

# Table 1.Summary of test conditions: 96-h rainbow trout (Oncorhynchus mykiss)survival test.



APPENDIX B – Toxicity test data



Method	TRD	Client	FERIL	>	Reference _	1718	-05-90
Test Log					Sample Inf	ormation	
Davi	Data	Time faiti	al Cham Cart	Daily Data	Initial altr		-74
Day	Vale,	1745-1 60		Review	nitiai pri. Istial CC /ut	E /com):	1115
0	-01/1/10/04	1375 14		33	miniar de (p. 1936) DO 79	sy citij.	105
1	2017112130	INW SS		14/	Initial DO (r	ng/L):	10.5
2	2017(10) 31	1020 HAB	-		Initial Temp	(°C):	15.7
3	1018/01/01	1015 1-0		<u>P</u>	Salinity (pp	ij: 	
4	1005/01/02	1000 111	- /	H5 od with fich	Nets used:	yes / (	
Sample Pre	-Aeration e adjusted to 6.5 +/- 1 m	L/min/L ye/no	i the test was load	eu with fish	i		
Preaeration	time	0.5 hours 1 ho	our 1.5 hours	2 hours			
DO(mg/L) of	f 100%	<u>7.8</u>					
Test Chemis	stry and Biology						
Conc.	CTL	12 25	50	100			ו
							-
		pH (units	) (range: 5.5-8.5)				-
Day 0	7.8 81	81 81	1 81	NO.			
Day 4	8.1 8.7	8.2.8	1 3.1	5.0			)
			· ·				
	101111	E CONTRACTOR		1171			7
Day 0	445 514	561 67	1 005	1116			_
Day 4	490 543	564 67	13 824	1318			
		DO (mo/l.) (70-100	% raturation at te	ast terms )			
00	a101						٦
Dayu	1 8 1	818	X 4 2	8'2			-
Day 4	8.7 8.1	0.7 3	TOT	6.7			4
		Temperature	('C) transe: 14-16	50			
Day 0	THALHO	THO 17	(c) 140	1742			Г
Day 4	100 100	10 10	1 1 0	1110			-
Udy 4	17.0 1.1	14,0117	.0 11.0	19.0			
		Number Alive (In	brackets number s	stressed)			
Day 0	10 /10	10 1	n / u	/12			
Day 1	10 10		0 10	10			-
Day 2				1.0			
Day 2				10			-
Day 3	10 10	10 11	2 /0	10	<u> </u>		-
Day 4		1 100	0 6	10	46 4 4 4 4 4 4 4		
	Unless otherwise noted	behavior is considu	ered to be normal	benavior in	the control		
		,					
Control Or	ganism Data			Test Orga	nism Infor	mation	
Control	Length Weight				0-1-		1
Fish	(cm) (g)			Batch	-701	111 78	
1	20102	Loading Deputy (r	Mr. 1.13	Source	15	:1	
2	20 0.2	Coading Density (g	11-1- <u>0.1.5</u>			) \	-
3	2003	Mean Lenoth (cm)	2.9	Davs Held	(5)		
4	38 0.3			1		•	
S	3.1 0.3	Length Range (cm	1: 26-31	Percent st	ock mortali	ty	0.82
6	30 n.3			{7 days prior	to test, must l	be \$2%)	
7	31 0,3	Mean Weight (g):	<u>_0.3</u>			0	
8	2.8 0.2	(Must be 20.3g)		Test Volu	me (L)	do	
9	28 02		12				
10	2.6 03	JWeight Range: (g)	0.2-0.5				
Commente				L			
- vonnents							
						,	
8	Reviewed By: Th	1	Date Reviewed	l:^Z	0 8 0	103	

Written by SG on 1995/05/12 Revised by CQ on 2017/09/28



APPENDIX C – Chain-of-custody form

by SG on 1995/05/12   by KS on 2002/12/09	NGRY BAYTALUKE	quished By				STEWATER Hung	Sample ID Sa	50% surcharge; 100% surchar	e/PO/Job 17 - S - 30	1 - 403 -	g Address: 1505 - 17	ort Address: 1505 - 17	act: PATRICK MAJ	nt / Operation: FERNIE ,	orting and Billing Informat	
	Dec 27 / 17 @ 17:00	Date / Time			- 3	gry / Dec 27 / 17 / 16:45	mpled By / Date / Time	rge (evenings and weekends)		- 861 - 8730	TH AVENUE S.W. CALG	TH AVENUE S.W. CALG	JER	ALPINE RESORT UTILITIE	tion Client:	Test Re
HydroQual Laborator		Received By				Femie Alpine Resort	Location	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second		Fax 1 - 403 - 244 - 3774	ARY, ALBERTA T2T OE	ARY, ALBERTA T2T OE2		ES CORPORATION	ARUC Sample:	quest / Chai
here Lite. 2×20	Du	(HQ)				Grab Effluent	Method Type				2	2	1 day		Fer 116	in of Cust
LPa	2	Date	 Nb.	 79-17	e redu	Partie		1		1000	AND AND		alan n Serah n	and and a second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second		lody
15	YTAL28	/ Time				×	Notes: S = singl Check approp		-				LC 50	TR D	Tests Reque: (example: tro	Calg
File: F2000020.xls / t	10.35 an						be treatment, D = multiple t								sted (codes on back) ut with 5 treatments,	ary, Alberta Canada Tel (403) Fax (403)
est request 00020 v 3.0		ŀ			lonen		treatments	(	(u / K)	) tastn	i bəvi	Boek	əldmi	s ∶	TR-D)	a T2H 2K1 253-7121 252-9363



**END OF REPORT** 



## **Acute Toxicity Test Results**

Sample collected April 25, 2018

Final Report

May 10, 2018

Submitted to:

Fernie Alpine Resort Calgary, AB

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



#### SAMPLE INFORMATION

Comple ID (		Dates		Bassint
Internal ID	Collected	Received	Rainbow trout test initiation	temperature
WASTEWATER/	25 Apr 19 at 1645b	26 Apr 19 at 1020b	27 Apr 19 at 1140b	12°C
1718-1006	23-Abi-10 91 104311	20-Apr-16 at 10500	27-Api-10 at 11400	13 C

#### **TEST TYPES**

• Rainbow trout 96-h LC50 test

#### RESULTS

#### **Toxicity test results**

Sample ID	Rainbow trout LC50 (% v/v) [95% CL]
WASTEWATER	>100 [NA]

CL = Confidence Limit, LC = Lethal Concentration,

#### QA/QC

QA/QC summary	Rainbow trout
Reference toxicant LC50 (95% CL)	4.2 (3.7-4.6) g/L KCl <sup>1</sup>
Reference toxicant historical mean (2 SD Range)	3.1 (2.3-4.3) g/L KCl
Reference toxicant CV	10.5%
Organism health history	Acceptable
Protocol deviations	None
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

<sup>1</sup> Test date, April 5, 2018

LC = Lethal Concentration; CL = Confidence Limit

UTILUS ONMEN

Report By: Linda Fan, BSc Biologist

Reviewed By: Madison Lehti, BSc Biologist

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

Nautilus Environmental Company Inc.



**APPENDIX A – Summary of test conditions** 



Test species	Oncorhynchus mykiss
Organism source	LSL Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	22-L plastic pails with polyethylene liners
Test volume	20 L
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 (KCI)

# Table 1.Summary of test conditions: 96-h rainbow trout (Oncorhynchus mykiss)survival test.



**APPENDIX B – Toxicity test data** 



## **Trout Bench Sheet**

Method 1	72D Client FR	PIL6 Reference	176-IN	06-	Chamber 9	
1 Test Log	- the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec		1-10-10		Sample Information	
Test tog				Daily Data		
Day	Date	Time Initial	Chem. Cart	Review	Initial pH: -1.+	
0	2015101127	I IIYU I HP		JP	Initial EC (µS/cm):	
2	2015101125	CARREN NEW		<u><u> </u></u>		
3	2010/01/201	ATTER FORD AND IN	0 -		Salinity (ppt):	
4	2013 105 101	1045 STA	DIMUTERI	db.	Nets used: yes / no )	
		Note: * ; time when the tes	was loaded with	n fish		
Sample Pre-A	eration				DO IN Mg/L (70% - 100%	
Preaeration tir	adjusted to 6.5 +/~ 1 mt/min ne	UShours 1 hour	1.5 hours	2 hours	52 mol - 89 mol at 14'C	
DO(mg/L) of 1	100%	8.9			6.1 mg/L 8.8 mg/L at 15°C	
					6.0 mg/L - 8.6 mg/L at 16°C	
Test Chemisti	ry and Biology				"corrected for altitude	
Conc		12125	150-	$\square \square$		
		oH (upits)	(man and 5 5.9 5)			
Day 0	LUTZ4		(iaige 3.3-8.3)			
Day 4	82 02	7.3 7.3	25	7.2		
,			0			
		EC	(uS/cm)			
Day 0	554 573	572 580	501	297		
Day 4	Sup SP2	1 5741 57M	1 585	1 694		
		DD (ma/l.) (70-100%	saturation at te	st temp.)		
Day 0	89 29	84 8.9	8.9	89		
Day 4	7.4 8.4	8.5 8.4	8.4	25		
00		Temperature (	<sup>•</sup> C) (range: 14-16	5°C)		
Day U Day 4	HE M	19 19	14	17		
Day 4	14 10	1.10 1.10	1 10		.I., k	
		Number Alive (In b	rackets number s	tressed)		
Day 0		16 10		10.		
Day 1	-10 10		-iO	$-\sigma_{j-1}$		
Day 2	1.0 10		10			
Day 4	of Up	$+(9_{0}+19_{0})$		1-12-		
50,7	Validity Criteria: must be :	≤ 10% mortality and/or stress	ed behavior in th	he control		
	Unless otherwise noted, bel	navior is considered to be nor	mal			
Control Organ	nism Data			Test Organi	sm Information	
Fish	(cm) (g)			Batch	ZUSZBBTP	
1 ¥	39 01	Loading Density (g/L):	0.2	Source	151-	
2	36 0.6	(must be s0.5 g/l)		1		
3	7.7 0.3		25	Tank #		
4	36 05	Mean Length (cm):	35-	ц.,	ALL ALL ALL ALL ALL ALL ALL ALL ALL ALL	
5	3.4 0.5	Laugh Danag (cm)	20.24	Days Held at	15±20	
7	3.4 0.5	I cengin Range (chi):	2.641	Jamust de 214 t	daysj	
8	26 06	Mean Weight (g):	0.5	Percent stoc	k mortality 0.7.4	
9	3.6 06	(Must be 20.3g)	<u> </u>	(7 days prior to	test, must be ±2%	
10	3.6 0.6.		\$2.010	2	20	
		Weight Range: (g):	0.0.0.4	Test Volume		
Commente		1 1 . 5 . 1 7	X ()		to unstadilla	
Comments :	* 1 tout tour	t outside build	et (jump	(d)-not	induced in	1 13-10C
			3	mo	rtainty, or weight	Calculations.
		~~~				
	Reviewed 8	y: JY		Date Reviewe	d: 2018105102	

Written by SG on 1995/05/12 Revised by JP on 2018/03/14 Nautilus Environmental (Calgary)

File: TR Bench Sheet F051



**APPENDIX C – Chain-of-custody form** 

by SG on 1995/05/12 I by KS on 2002/12/00	JNGRY BAYTALUKE Apr 25 / 18 @ 17:00 D V	inquished By Date / Time Received By (HQ)		acod	NOS/IT	\$1.39	Dro Poff	2×20L Pails	Hungry / April 25 / 18 / 16:45 Fernie Alpine Resort Grab Effluen	Sample ID Sampled By / Date / Time Location Method Type	str 50% surthame. 100% sumhame (avanings and vindende)	El Fax Fax 1 - 403 - 861 - 8730 1 - 403 - 244 - 3774	Iling Address: 1505 - 17TH AVENUE S.W. CALGARY, ALBERTA T2T 0E2	eport Address: 1505 - 17TH AVENUE S.W. CALGARY, ALBERTA T2T 0E2	ontact: PATRICK MAJER	lient / Operation: FERNIE ALPINE RESORT UTILITIES CORPORATION	eporting and Billing Information Client: FARUC Sample: Fer 116	ydroQual Laboratories Ltd. Test Request / Chain of Cus
File: F2000020.xts / test request	2018/04/26 10:30	Date / Time	educ			y.	n Onl	y Fox	μ ενal	Notes: S = single treatment, D = multiple treatments	(u / ,	Intact ()	i bəvi	Rece	əldme		Tests Requested (codes on back) (example: trout with 5 treatments. TR-D)	Calgary, Alberta Canada T2H 2K1 Tel (403) 253-7121 Fax (403) 252-9363



**END OF REPORT** 



## **Acute Toxicity Test Results**

Sample collected December 27, 2018

**Final Report** 

January 14, 2019

Submitted to:

Fernie Alpine Resort Fernie, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



#### SAMPLE INFORMATION

a 1.15/		Pocoint			
Sample ID/	Collected	Received	Rainbow trout test initiation	temperature	
WASTEWATER /	27 Dec 19 at 1645b	21-Doc-18 at 0815h	01-lan-19 at 13/0h	10.1°C	
1819-0589	27-Dec-16 at 10451	51-Dec-16 at 001511	01-341-13 41 13-01	10.1 C	

#### **TEST TYPES**

• Rainbow trout 96-h LC50 test

#### RESULTS

#### **Toxicity test results**

Rainbow trout LC50 (% v/v)
>100

LC = Lethal Concentration

#### QA/QC

QA/QC summary	Rainbow trout
Reference toxicant LC50 (95% CL)	3.2 (2.7-3.5) g/L KCl <sup>1</sup>
Reference toxicant historical mean (2 SD Range)	3.8 (2.8-5.1) g/L KCl
Reference toxicant CV	9.6%
Organism health history	Acceptable
Protocol deviations	None
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

<sup>1</sup>Test date, December 19, 2018

LC = Lethal Concentration; CL = Confidence Limit



MEDEMED

Reviewed By: Madison Lehti, BSc Senior Biologist

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

Report By:

Biologist

Alvin Pham, BSc

- Alis



**APPENDIX A – Summary of test conditions** 



Test species	Oncorhynchus mykiss
Organism source	Fish hatchery
Organism age	luvenile
Test type	Static
Test duration	96 hours
	5 gallon glass aquariums
Tost volume	10 - 201 depending on size of fish
Test colution dopth	Minimum 15 cm
Test concentrations	Five concentrations, plus laboratory control
Test concentrations	1 per treatment
Number of erganisms	10 per replicate
Control/dilution water	To per replicate
Control/dilution water	De-chonnated City of Calgary tap water
l'est temperature	
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)

# Table 1.Summary of test conditions: 96-h rainbow trout (Oncorhynchus mykiss)survival test.



APPENDIX B – Toxicity test data



### **Trout Bench Sheet**

						ž		
Method	TRD a	ient	FERIIL	Reference	1819-	05978 8	Chamber	5
Test Log							Sample Inform	nation
Day 0 1 2 3 4	PR Date 2016 2017 2019 / 01 / 01 2019 / 01 2019 / 01 2019 / 01 2019 / 01	1/01/07 57 104 104	Time 1540 • 1115 0835 0815 1630	Initial AP UF AP CF NP (B	Chem. Carl	Daily Data Review SS VIL P LUL	Initial pH: Initial EC (µS/ci Initial DO (mg/ Initial Temp (*C Salinity (ppt):	7.0 n): 956 L): 8.5 ): 18.7 0
Sample Pre-/	Aeration	'	Note: * ; time w	hen the test	was loaded with	fish	DO in ma/L (7	0% - 100%
Aeration rate Preaeration ti DO(mg/L) of	adjusted to 6.5 +/ me 100%	1 mL/min/l	vesno 0.5 hours	1 hour	1.5 hours	2 hours	saturation)** 6 2 mg/L 89 mg/ 6.1 mg/L 8.6 mg/ 6 0 mg/L 8.6 mg/	L at 14 C L at 15 C L at 16 C
Test Chemist	ry and Biology	-	(4)				**corrected for all	itude
Conc.		6	12	15	1.30	1.80		
Day 0 Day 4	7.9	7.8	7.8	pH (units) ( 7.8 7.9	range: 5.5-8.5) 7.6 7.6	7.5 7.7		
5	1.20			EC	uS/cm)			
Day 0 Day 4	343	454	486	<u>9102</u> 122	71/ 732	439		
Day 0 Day 4 Day 0 Day 4		8.8 3. 8 15	DO (mg/l 2.2 . 3.5 Te	) (70-100% ?. 8 8. 6 mperature (*	saturation at te	st temp.)		
			A.L	AK				
Day 0 Day 1 Day 2 Day 3 Day 4	IO       IO       Validity Criteria:       Unless otherwise	{ 10 10 10 must be ≤ noted, beha	LiD LO LO LO LO LO LO LO LO LO LO LO LO LO	I Alive (In br.	ackets number si	ressed)		
Control Orga	nism Data					Test Organis	m Information	
Control Fish	Length (cm)	Weight (g)				Batch	201810	30TR
1 2 3 4 5 6 7 8 9		D.S 0.6 0.S 0.S 0.S 0.S 0.Y 0.Y	Loading Densit) (must be 30 5 gA) Mean Length (c Length Range (c (Mean Weight (c (Must be 20 3a)	; (g/L): nu: cm): 2 g)	0.3 34 0-3.7 0.5	Source Tank # Days Held at must be 214 d Percent stock (7 days prior to 2	LSL 2 15±2C avs) mortality est, must be <220	63
10	3.0	0.3	] Weight Range	g): 🖸	.3-0.6	Test Volume (	L) .	18

- -

Reviewed By: TM

Date Reviewed: 2019101/08

Written by SG on 1995/05/12 Revised by JP on 2018/08/20



APPENDIX C – Chain-of-custody form

Written by SG on 1995/05/12 Revised by KS on 2002/12/09 HydroQual Quote/PO/Job 17 - S - 30 Report Address: Reporting and Billing Information 2018/12/3 Rush: 50% surcharge; 100% surcharge (evenings and weekends) Billing Address: Contact: Client / Operation: 6000 NoS/NoT e Relinquished By 18 9-0580 51.8 þ Sample ID WASTEWATER Kirkland Matchim S land and in 20L pails Condition Laboratories Ltd. PATRICK MAJER FERNIE ALPINE RESORT UTILITIES CORPORATION 1505 - 17TH AVENUE S.W. CALGARY, ALBERTA T2T 0E2 1505 - 17TH AVENUE S.W. CALGARY, ALBERTA T2T 0E2 1 403 - 861 - 8730 Kirkland / Dec. 27 / 18 / 16:45 Sampled By / Date / Time Date / Time Dec 27 / 18 @ 17:00 Test Request / Chain of Custody Client: FARUC Fax 1 - 403 - 244 - 3774 Fernie Alpine Resort HydroQual Laboratories Ltd. ocation Sample: Fer 116 Received By (HQ) Grab Method Effluent Type Date / Time Tests Requested (codes on back) Notes: S = single treatment, D = multiple treatments Check appropriate box below example: trout with 5 treatments, TR-D) TR × Calgary, Alberta Canada T2H 2K1 File: F2000020 xls / test request Fax (403) 252-9363 Tel (403) 253-7121 Form: F2000020 v 3.0 Sample Received intact (y / n) Ediled by Foxit Reader Copyright(C) by Foxit Software Company,2005-2007 For Evaluation Only.

#3, 6125 12th Street SE

19580478



**END OF REPORT** 

		CERTIFICATE	OF INSU	JRANCE						
BROKER Toole Peet & Co. Limited P.O. Box 4650 Station C 1135 - 17 <sup>th</sup> Avenue SW Calgary, AB T2T 5R5		This certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policies below.								
BROKER'S CLIENT ID:				COMPANIES AFF	ORDING COVERAGE					
INSURED'S FULL NAME AND MAILIN	IG AD	DRESS	COMPANY A		s under contract MKL2019001					
			COMPANY <b>B</b>	Economical Ir	isurance					
Environmental Diagnostic Inc.	s In	c. and Sabau Holdings	COMPANY C							
#140, 5050 - 106 Ave. SE Calgary, AB T2C 5E9			COMPANY D							
		cov	ERAGES							
This is to certify that the policies of insurar contract or other document with respect t	nce liste o which	ed below have been issued to the insured nam this certificate may be issued or may pertain conditions	ned above for the po . The insurance afford of such policies.	blicy period indicated, notwiths orded by the policies describe	standing any requirement, term or condition of any d herein is subject to all the terms, exclusions and					
TYPE OF INSURANCE	CO	LIMITS SHOWN MAY HAVE I POLICY NUMBER	POLICY EFFECTI DATE (MM/DD/)	BY PAID CLAIMS           EVE         POLICY EXPIRATION           YY)         DATE (MM/DD/YY)	LIMITS OF LIABILITY					
	LIK				EACH OCCURRENCE -BODILY INJURY,					
COMMERCIAL GENERAL LIABILITY	A	BINDER	3/30/2019	3/30/2020	PROPERTY DAMAGE,           PERSONAL INJURY           \$ 2,000,000           GENERAL AGGREGATE           \$ 2,000,000					
PRODUCTS AND / OR COMPLETED OPERATIONS     EMPLOYERS' LIABILITY     CROSS LIABILITY					PRODUCTS - Comp/Ops Agg. \$ Included TENANT'S LEGAL LIABILITY \$ 500,000					
V TENANT'S LIABILITY NON-OWNED AUTOMOBILES V HIRED					MED EXP (any one person)         \$         2,500           NON-OWNED AUTO         \$         2,000,000					
CONTRACTUAL LIABILITY					\$					
AUTOMOBILE LIABILITY DESCRIBED AUTOMOBILES ALL OWNED AUTOMOBILES LEASED AUTOMOBILES	OBJEL LIABILITY     B     64019971P       DWNED AUTOMOBILES     ED AUTOMOBILES		9/18/2018	9/18/2019	BODILY INJURY PROPERTY DAMAGE COMBINED \$ 2,000,000 BODILY INJURY (Per Person) BODILY INJURY (Per Accident) PROPERTY DAMAGE \$					
**ALL AUTOMOBILES LEASED IN EXCESS OF 30 DAYS WHERE THE INSURED IS REQUIRED TO PROVIDE INSURANCE										
EXCESS LIABILITY UMBRELLA FORM OTHER THAN UMBRELLA FORM (Specify)					\$ \$					
OTHER LIABILITY (SPECIFY)					\$					
ENVIRONMENTAL CONSULTING     PROFESSIONAL (ERRORS AND OMISSIONS)     LIABILITY-CLAIMS MADE COVERAGE	A	BINDER	4/20/2019	4/20/2020	LIMIT ANY ONE CLAIM/POLICY AGGREGATE \$ 3,000,000					
ENVIRONMENTAL IMPAIRMENT LIABILITY     (Claims Made)	A	BINDER	3/30/2019	3/30/2020	EACH CLAIM <b>\$ 1,000,000</b>					
					PERIOD (OFF SITE THIRD PARTY) \$ 1,000,000					
ADDITIONAL INSURED			DES	CRIPTION OF OPERATIO	NS, LOCATIONS/ AUTOMOBILES/ SPECIAL					
			Envi Asse Plan Inc.:	ronmental Diagnostics: Envi ssment, Risk Management P s, Soil and Groundwater Ren : Holding Company	ronmental Site lans, Remedial Action nediation. Sabau Holdings					
CERTIFICATE HOLDER	1		CAN	ICELLATION						
To Whom It May Concern			Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will endeavor to mail $\Omega$ days written notice to the certificate holder named to the left, but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or							
SIGNATURE OF AUTHORIZED REPRESENT		)	FAX (40)	NUMBER 3) 228-0231	EMAIL ADDRESS eshea@toolepeet.com					
PRINT NAME INCLUDING POSITION HELD Erica Shea, Account Mana	ger		CON Too	IPANY Ie Peet & Co. Limited	April 16, 2019					