



2015 SEWAGE TREATMENT PLANT ANNUAL REPORT

Prepared for:

FERNIE ALPINE RESORT UTILITIES CORPORATION

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1.0 INTRODUCTION

1.1 BACKGROUND

The following annual report for the Wastewater Treatment Plant at Fernie Alpine Resort (FAR) operated by Fernie Alpine Resort Utilities Corporation (FARUC) is compiled in accordance with the requirements of the Municipal Sewage Regulation (MSR). This report covers the calendar year 2015.

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

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

Plant effluent quality has been high during the year. There was a slight increase in ortho phosphorus levels and a slight decrease in total phosphorus levels this year. There were three samples out of twenty-one which were above the MSR discharge limit for ortho phosphorus, which were slightly above the MSR discharge limits and no samples for total phosphorus were above 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 until all the total phosphorus concentrations are within 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. 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:

Field Sample
Field Sample, measured in Celsius
Field Samples, measured as m ³ /d
Five day biochemical oxygen demand, measured in mg/l
Total suspended solids or non filterable residue, measured in mg/l
Ammonia concentration, expressed as nitrogen in mg/l
Nitrate concentration, expressed as nitrogen in mg/l
Nitrite concentration, expressed as nitrogen in mg/l
Total phosphorous concentration, measured in mg/l
Orthophosphate concentration, measured in mg/l
Bacterial concentration, measured as colony forming units per 100ml
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.

Parameter	Limit	Unit
Flow	1280	m ³ /d
BOD₅	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 Effluent Limits

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

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

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

2.3 REPORTING REQUIREMENTS

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

In addition the report must also include the following:

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

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

2.4 SAMPLING FREQUENCY

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

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

A minimum of 12 influent samples are required for 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.

	Janpin	IY LUCA			i	
Parameter		1	Lo	cation		1
i arameter	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
NH3-N	WS/G	18	/	/	M/G, WS/G	25
NO3-N	WS/G	18	/	/	M/G, WS/G	25
NO ₂ -N	WS/G	18	/	/	M/G, WS/G	25
Total-P	WS/G	18	/	/	M/G, WS/G	25
Ortho-P	WS/G	18	/	/	M/G, WS/G	25
Fecal Coliform	WS/G	18	/	/	M/G, WS/G	25
Toxicity Bioassay	/	/	/	/	3 Y/G	3

Table 2

Ð

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 2015 data to previous years.

Total effluent flow from the WWTP for all of 2015 was recorded from the effluent weir type flow meter as 90,931 m³ and the average was 250 m³ 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 2015 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 was 378 m³/day. The average daily flow was 484 m³ per day in 2014, 485 m³ per day in 2013, the average daily flow could not be calculated in 2012 but it was 479 m³ per day for the same time period in 2011, compared to 412 m³/day over the same period in 2010. Peak flow for the year reached 1,058 m³/day on February 7th, 2015, which was 17% below the allowable daily limit of 1,280 m³/day. The peak flow was slightly higher than that of 2014 (1,036 m³/day). The peak flow is lower than that of 2013 (1,181 m³/day) and 2009 (1,178 m³/day), but higher than of 2012 (811 m³/day), 2011 (989 m³/day) and 2010 (823 m³/day). The peak flow day occurred during the heavy ski season, which is to be expected.

All recorded months showed larger flow effluent than influent. This can be explained by using the potable water to spray the clarifiers to avoid foaming.

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A summary of sewage flow for years 2003 through 2015 is provided in Table 3 and Figures 2 and 3:

Table 3

Voor	Sewage Flow	Davs Over		
Tear	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* (122,275) ¹	335	989 ²	0
2012	62,509** (122,610) ¹	335	811 ²	0
2013	121,982	335	1,181	0
2014	125,437	344	1,036	0
2015	90,931	250	1,058	0

2003 – 2015 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

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

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

2004 to 2012

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

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

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

The average flow for 2009 further decreased from 2008 (372 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 m³/day down to 287 m³/day) and there were no instances where the flow exceeded the 1,280 m³/day. The peak flow decreased from 2009 and is comparable to 2008.

The average flow for 2011 had increased slightly from 2010 (287 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 2015

The average flow for 2015 has decreased slightly since 2013 at 250 m^3 /day and there are no instances where the flow exceeded the 1,280 m^3 /day. The peak flow has increased slightly compared to 2014 (1,036 m^3 /day vs 1,058 m^3 /day); however, it was comparable to 2003 to 2007, 2009, 2013 and 2014. Please note that the peak flows from 2011 and 2012 may not be representative as there was data missing for both years.

As seen in previous years, the highest peak flow was in February; high peak flows also occurred systematically in January, March and December, which is consistent with the facility operations. The highest month in 2015 for average flows was in February, in which the peak flow was also observed.

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



<u>Figure 4</u> 2015 Sewage Effluent Average and Peak Flows by Month

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; in 2008 this figure decreased to 51% and 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 is 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.

Note that 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 2015.



Figure 6 2015 Water Consumption and Sewage Generation

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 2015 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 and 2014 respectively, the correction factors were 1.20, 0.89, 1.14, 0.65, 0.76, 0.62, 0.91 and 0.80 which showed that the resort had reduced the impact of both stormwater infiltration and reduced peak flows. The correction factor was 0.81 in 2015.

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 and 2016 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 stormwater 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.

Even with additional expansion, FARUC may not require an increase to permit discharge above the current limit of 1280 m³/day if the flow restriction measures prove sustainable. Sewage discharge rates will be monitored and an application will be submitted to increase the maximum daily discharge when warranted.

Based on the 2015 flow data, the plant has an unused capacity of 222 m³/day due to the flow saving measures. This still needs to be closely monitored during 2016 and further considered when adding additional development.

	2007	2008	2009	2010	2011
Estimated Wastewater Flow (m ³ /day)	979.2	979.9	1032.4	1261.4	1302.3
Actual and Corrected (m ³ /day)	1177 (a)	873 (a)	1178(a)	823 (a)	989 (a)

Table 4 Projected Peak Flows: 2007-2016

	2012	2013	2014	2015	2016
Estimated Wastewater Flow (m³/day)	1302.3	1302.3	1302.3	1302.3	1302.3
Actual and Corrected (m³/day)	811 (a)	1181 (a)	1036 (a)	1058 (a)	1120 (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 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
	AVERAGE	= 0.86

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

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



<u>Figure 7</u> Estimated vs Actual Peak Flows (Historical)

5.0 OVERVIEW OF ELK RIVER SAMPLE RESULTS

This section provides data and analysis for the Elk River samples taken during 2015.

Table 5 provides a summary record of the Elk River test results for the time period from January 1st, 2015 to December 22nd, 2015.

No significant changes were observed in pH, phosphorous or nitrogen concentrations during any of the river sample periods. In general, ortho phosphorus was highest in the outfall but all the results from down-stream were consistently below laboratory detection limits. Elevated nitrate was observed in the outfall on Jan. 1st. The results were low in both up-stream and down-stream samples from the same day and levels of nitrate were observed in the effluent on those days was consistent with results from throughout the year. Elevated levels of TSS were observed on May 28th and June 11th. The levels were elevated in the up-stream, outfall and down-stream samples and the results in the effluent on the same days were below detection limits. Elevated coliforms were detected in the outfall on May 28th and June 11th. The levels were elevated in the up-stream, outfall and down-stream samples and the results in the outfall on May 28th and June 11th. The levels were elevated in the up-stream, outfall and down-stream samples and the results in the outfall on May 28th and June 11th. The levels were elevated in the up-stream, outfall and down-stream samples and the results in the outfall on May 28th and June 11th. The levels were elevated in the up-stream, outfall and down-stream samples and the results were at or below detection limits in the effluent on the same days.

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.

		Tab	le 5			
2015 B	Elk R	iver S	Samp	ole I	Resu	lts

Sample Date	nple Date NH ₃ Ortho-P			Coliform				Total P mg/L				
(yyyy-mm-dd)	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN
2015-01-01	0.05	0.05	0.05	0.005	0.182	0.005	1	9	2	0.005	0.196	0.008
2015-01-07	0.05	0.05	0.05	0.005	0.070	0.005	1	3	1	0.007	0.073	0.005
2015-01-14	-	0.05	0.05	-	0.020	0.005	-	1	1	-	0.022	0.006
2015-01-21	0.05	0.05	0.05	0.005	0.038	0.005	1	1	1	0.008	0.004	0.006
2015-01-28	0.05	0.05	0.05	0.007	0.009	0.005	1	1	1	0.017	0.013	0.007
2015-04-29	0.05	0.05	0.05	0.005	0.005	0.005	1	1	2	0.016	0.019	0.018
2015-05-07	0.05	0.05	0.05	0.005	0.005	0.005	1	1	1	0.017	0.015	0.020
2015-05-13	0.05	0.05	0.05	0.005	0.005	0.005	4	1	1	0.022	0.011	0.011
2015-05-21	0.05	0.43	0.05	0.005	0.005	0.005	1	1	2	0.021	0.026	0.033
2015-05-28	0.05	0.05	0.05	0.006	0.006	0.006	25	24	38	0.089	0.090	0.095
2015-06-11	0.05	0.05	0.05	0.005	0.005	0.005	8	16	4	0.035	0.038	0.040
2015-10-01	0.05	0.05	0.05	0.005	0.005	0.005	1	1	1	0.005	0.006	0.007
2015-10-08	0.05	0.05	0.05	0.005	0.005	0.005	1	1	1	0.005	0.005	0.005
2015-10-15	0.05	0.05	0.05	0.005	0.005	0.005	1	2	1	0.005	0.006	0.005
2015-10-22	0.05	0.05	0.05	0.005	0.005	0.005	1	1	1	0.005	0.005	0.005
2015-10-28	0.05	0.05	0.05	0.005	0.005	0.005	1	1	1	0.005	0.005	0.005
2015-11-05	0.05	0.05	0.05	0.005	0.005	0.005	1	1	1	0.006	0.061	0.005
2015-12-22	0.05	0.05	0.05	0.005	0.009	0.005	1	8	3	0.006	0.010	0.005
# Samples	17	18	18	17	18	18	17	18	18	17	18	18
Average	0.05	0.07	0.05	0.005	0.022	0.005	3	4	4	0.016	0.034	0.016
Maximum	0.05	0.43	0.05	0.007	0.182	0.006	25	24	38	0.089	0.196	0.095
Minimum	0.05	0.05	0.05	0.005	0.005	0.005	1	1	1	0.005	0.004	0.005
Sample Date		TSS			рН			N-NO ₃			N-NO ₂	
Sample Date (yyyy-mm-dd)	UP	TSS IDZ	DN	UP	рН IDZ	DN	UP	N-NO ₃ IDZ	DN	UP	N-NO ₂ IDZ	DN
Sample Date (yyyy-mm-dd) 2015-01-01	UP 3.0	TSS IDZ 3.0	DN 3.0	UP 8.37	pH IDZ 8.24	DN 8.39	UP 1.35	N-NO ₃ IDZ 13.00	DN 1.47	UP 0.01	N-NO₂ IDZ 0.01	DN 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07	UP 3.0 3.0	TSS IDZ 3.0 3.0	DN 3.0 3.0	UP 8.37 8.43	pH IDZ 8.24 8.35	DN 8.39 8.47	UP 1.35 1.80	N-NO₃ IDZ 13.00 4.75	DN 1.47 1.80	UP 0.01 0.01	N-NO₂ IDZ 0.01 0.01	DN 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-07	UP 3.0 3.0 -	TSS IDZ 3.0 3.0 3.0	DN 3.0 3.3 3.3	UP 8.37 8.43 -	pH IDZ 8.24 8.35 8.23	DN 8.39 8.47 8.38	UP 1.35 1.80 -	N-NO₃ IDZ 13.00 4.75 5.14	DN 1.47 1.80 0.79	UP 0.01 0.01 -	N-NO₂ IDZ 0.01 0.01 0.01	DN 0.01 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-14 2015-01-21	UP 3.0 3.0 - 3.3	TSS IDZ 3.0 3.0 3.0 3.0	DN 3.0 3.3 3.0	UP 8.37 8.43 - 8.44	pH IDZ 8.24 8.35 8.23 8.34	DN 8.39 8.47 8.38 8.47	UP 1.35 1.80 - 1.91	N-NO₃ IDZ 13.00 4.75 5.14 4.42	DN 1.47 1.80 0.79 1.94	UP 0.01 0.01 - 0.01	N-NO₂ IDZ 0.01 0.01 0.01 0.01	DN 0.01 0.01 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-14 2015-01-21 2015-01-28	UP 3.0 3.0 - 3.3 3.0 4.7	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0	DN 3.0 3.3 3.0 3.0 3.0	UP 8.37 8.43 - 8.44 8.41	pH IDZ 8.24 8.35 8.23 8.34 8.34 8.40	DN 8.39 8.47 8.38 8.47 8.47	UP 1.35 1.80 - 1.91 1.32	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32	DN 1.47 1.80 0.79 1.94 1.59	UP 0.01 0.01 - 0.01 0.01	N-NO₂ IDZ 0.01 0.01 0.01 0.01 0.01	DN 0.01 0.01 0.01 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-14 2015-01-21 2015-01-28 2015-04-29	UP 3.0 3.0 - 3.3 3.0 4.7	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	DN 3.0 3.3 3.0 3.0 3.0 9.3	UP 8.37 8.43 - 8.44 8.41 8.41 8.36	pH IDZ 8.24 8.35 8.23 8.34 8.34 8.40 8.48	DN 8.39 8.47 8.38 8.47 8.47 8.47 8.47	UP 1.35 1.80 - 1.91 1.32 1.12 1.42	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94	DN 1.47 1.80 0.79 1.94 1.59 1.31	UP 0.01 0.01 - 0.01 0.01 0.01	N-NO₂ IDZ 0.01 0.01 0.01 0.01 0.01	DN 0.01 0.01 0.01 0.01 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-21 2015-01-21 2015-01-28 2015-04-29 2015-05-07	UP 3.0 3.0 - 3.3 3.0 4.7 11.3	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	DN 3.0 3.3 3.0 3.0 3.0 9.3 11.3	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 2.40	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 2.44	DN 8.39 8.47 8.38 8.47 8.47 8.49 8.49	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49	UP 0.01 0.01 - 0.01 0.01 0.01 0.01	N-NO₂ IDZ 0.01 0.01 0.01 0.01 0.01 0.01	DN 0.01 0.01 0.01 0.01 0.01 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-07 2015-05-13	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 0.2	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 10.0 3.0	DN 3.0 3.0 3.3 3.0 9.3 11.3 3.0 16.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.45 8.40 9.22	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 8.45 8.41 8.20	DN 8.39 8.47 8.38 8.47 8.47 8.47 8.49 8.46 8.46 8.46	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.22	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.22	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40	UP 0.01 0.01 - 0.01 0.01 0.01 0.01 0.01	N-NO ₂ IDZ 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.0	DN 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.0
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-07 2015-05-13 2015-05-21	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 10.0 3.0 12.0	DN 3.0 3.3 3.0 3.0 9.3 11.3 3.0 16.0 20.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 8.41 8.45 8.41 8.36 8.23	DN 8.39 8.47 8.38 8.47 8.47 8.49 8.46 8.46 8.37 8.20	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.93	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.02	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.95	UP 0.01 0.01 - 0.01 0.01 0.01 0.01 0.01 0.	N-NO ₂ IDZ 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.0	DN 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.0
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-14 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-13 2015-05-21 2015-05-28	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 7.3 10.0 3.0 12.0 89.3 24.7	DN 3.0 3.3 3.0 3.0 9.3 11.3 3.0 16.0 96.0 20.7	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.24	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 8.41 8.36 8.27 8.20	DN 8.39 8.47 8.38 8.47 8.47 8.47 8.49 8.46 8.46 8.37 8.37 8.28 9.40	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.03 1.03	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.40	UP 0.01 0.01 - 0.01 0.01 0.01 0.01 0.01 0.01 0.01	N-NO₂ IDZ 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.0	DN 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.0
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-14 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-13 2015-05-21 2015-05-28 2015-06-11 2015-06-11	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0 22.0	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 7.3 10.0 3.0 12.0 89.3 24.7 2.0	DN 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 2.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 8.41 8.36 8.27 8.39 8.21	DN 8.39 8.47 8.38 8.47 8.47 8.49 8.46 8.46 8.37 8.28 8.40 8.23	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.03 1.03 1.10 2.11	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.14	UP 0.01 0.01 - 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01	N-NO₂ IDZ 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01	DN 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-14 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-13 2015-05-21 2015-05-28 2015-06-11 2015-10-01	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0 3.0 22.0	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 7.3 10.0 3.0 12.0 89.3 24.7 3.0 2.0	DN 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 2.2	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24 8.01	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 8.41 8.36 8.27 8.39 8.31 8.31	DN 8.39 8.47 8.38 8.47 8.47 8.49 8.46 8.46 8.37 8.28 8.40 8.33 8.23	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.03 1.10 2.11 2.25	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.14 2.28	UP 0.01 0.01 - 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01	N-NO₂ IDZ 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.0	DN 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-13 2015-05-21 2015-05-28 2015-06-11 2015-10-01 2015-10-08 2015-10-08	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0 3.0 3.0 2.0	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 24.7 3.0 3.0 3.0 3.0 3.0	DN 3.0 3.3 3.0 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 3.3 3.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24 8.24 8.35	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 8.41 8.36 8.27 8.39 8.31 8.15 8.17	DN 8.39 8.47 8.38 8.47 8.47 8.49 8.46 8.46 8.37 8.28 8.40 8.33 8.33 8.33 8.29	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.03 1.10 2.11 2.25 2.12	N-NO ₃ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28 2.15	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.14 2.14 2.28 2.15	UP 0.01 0.01 - 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01	N-NO₂ IDZ 0.01	DN 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-14 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-07 2015-05-21 2015-05-28 2015-06-11 2015-10-08 2015-10-15 2015-10-15	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 10.0 3.0 12.0 89.3 24.7 3.0 3.0 3.0 3.0	DN 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 3.3 3.0 3.3 3.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24 8.25 8.23	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 8.41 8.36 8.27 8.39 8.31 8.15 8.17 8.25	DN 8.39 8.47 8.38 8.47 8.47 8.49 8.46 8.46 8.37 8.28 8.40 8.33 8.33 8.33 8.28 8.25	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.03 1.10 2.11 2.25 2.12 2.09	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28 2.15 2.17	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.14 2.28 2.15 2.19	UP 0.01 0.01 - 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01	N-NO₂ IDZ 0.01	DN 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-14 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-07 2015-05-21 2015-05-28 2015-06-11 2015-10-08 2015-10-08 2015-10-15 2015-10-22	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 24.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0	DN 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 3.3 3.0 3.0 3.0 3.0 3.0 3.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.45 8.40 8.32 8.24 8.35 8.24 8.01 8.25 8.23 8.15	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 8.41 8.36 8.27 8.39 8.31 8.15 8.17 8.25 7.99	DN 8.39 8.47 8.38 8.47 8.49 8.46 8.46 8.46 8.37 8.28 8.40 8.33 8.33 8.28 8.25 9.12	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.03 1.10 2.11 2.25 2.12 2.09 2.21	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28 2.15 2.17 2.22	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.14 2.28 2.15 2.18 2.20	UP 0.01 0.01 - 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01	N-NO₂ IDZ 0.01	DN 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-13 2015-05-21 2015-05-28 2015-06-11 2015-10-08 2015-10-08 2015-10-22 2015-10-22 2015-10-22	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	TSS IDZ 3.0	DN 3.0 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 3.3 3.0 3.0 3.0 3.0 3.0 3.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24 8.25 8.23 8.23 8.15 8.15	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 8.41 8.36 8.27 8.39 8.31 8.15 8.17 8.25 7.88 8.25	DN 8.39 8.47 8.38 8.47 8.47 8.49 8.46 8.46 8.37 8.28 8.40 8.33 8.33 8.33 8.28 8.25 8.13 8.20	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.03 1.10 2.11 2.25 2.12 2.09 2.21 1.72	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28 2.15 2.17 2.22 1.52	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.14 2.28 2.15 2.18 2.30 1.98	UP 0.01 0.01 - 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01	N-NO₂ IDZ 0.01	DN 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-13 2015-05-21 2015-05-28 2015-06-11 2015-10-01 2015-10-08 2015-10-22 2015-10-28 2015-11-05 2015-11-05	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 10.0 3.0 12.0 89.3 24.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	DN 3.0 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24 8.25 8.23 8.23 8.15 8.21	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 8.41 8.36 8.27 8.39 8.31 8.15 8.17 8.25 7.88 8.25 8.27	DN 8.39 8.47 8.38 8.47 8.47 8.49 8.46 8.46 8.37 8.28 8.40 8.33 8.28 8.33 8.23 8.25 8.13 8.20 8.23	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.03 1.10 2.11 2.25 2.12 2.09 2.21 1.72 1.89	N-NO₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28 2.15 2.17 2.22 1.52 1.68	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.14 2.28 2.15 2.18 2.30 1.98 2.00	UP 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01	N-NO₂ IDZ 0.01	DN 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-13 2015-05-21 2015-05-28 2015-06-11 2015-10-01 2015-10-08 2015-10-28 2015-10-28 2015-11-05 2015-12-22	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	TSS IDZ 3.0 3.0 3.0 3.0 3.0 3.0 3.0 7.3 10.0 3.0 12.0 89.3 24.7 3.0	DN 3.0 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24 8.01 8.25 8.23 8.15 8.31 17	pH IDZ 8.24 8.35 8.23 8.34 8.40 8.48 8.45 8.41 8.36 8.27 8.39 8.31 8.15 8.17 8.25 7.88 8.25 8.27 18	DN 8.39 8.47 8.38 8.47 8.47 8.49 8.46 8.37 8.28 8.40 8.33 8.28 8.33 8.23 8.25 8.13 8.20 8.33	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.03 1.10 2.11 2.25 2.12 2.09 2.21 1.72 1.89 17	N-NO₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28 2.15 2.17 2.22 1.52 1.68 18	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.14 2.28 2.15 2.18 2.30 1.98 2.00 1.9	UP 0.01 0.	N-NO₂ IDZ 0.01	DN 0.01 0.
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-13 2015-05-21 2015-05-28 2015-05-28 2015-06-11 2015-10-01 2015-10-08 2015-10-15 2015-10-28 2015-10-28 2015-11-05 2015-12-22 # Samples	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	TSS IDZ 3.0 3.0 3.0 3.0 3.0 7.3 10.0 3.0 7.3 10.0 3.0 <td< td=""><td>DN 3.0 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 20.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 16.0 96.0 20.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0</td><td>UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24 8.01 8.25 8.23 8.15 8.15 8.31 17 8.30</td><td>pH IDZ 8.24 8.35 8.23 8.40 8.44 8.45 8.41 8.36 8.27 8.39 8.31 8.15 8.17 8.25 8.27 8.28 8.27</td><td>DN 8.39 8.47 8.38 8.47 8.49 8.46 8.46 8.37 8.28 8.40 8.33 8.28 8.33 8.23 8.25 8.13 8.20 8.33 8.20 8.33</td><td>UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.03 1.10 2.11 2.25 2.12 2.09 2.21 1.72 1.89 17 1.66</td><td>N-NO₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28 2.15 2.17 2.22 1.52 1.68 18 2.71</td><td>DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.14 2.28 2.15 2.18 2.30 1.98 2.00 18 1.70</td><td>UP 0.01 0.01 - 0.01</td><td>N-NO₂ IDZ 0.01</td><td>DN 0.01 0.</td></td<>	DN 3.0 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 20.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 16.0 96.0 20.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24 8.01 8.25 8.23 8.15 8.15 8.31 17 8.30	pH IDZ 8.24 8.35 8.23 8.40 8.44 8.45 8.41 8.36 8.27 8.39 8.31 8.15 8.17 8.25 8.27 8.28 8.27	DN 8.39 8.47 8.38 8.47 8.49 8.46 8.46 8.37 8.28 8.40 8.33 8.28 8.33 8.23 8.25 8.13 8.20 8.33 8.20 8.33	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.45 1.33 1.03 1.10 2.11 2.25 2.12 2.09 2.21 1.72 1.89 17 1.66	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28 2.15 2.17 2.22 1.52 1.68 18 2.71	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.14 2.28 2.15 2.18 2.30 1.98 2.00 18 1.70	UP 0.01 0.01 - 0.01	N-NO₂ IDZ 0.01	DN 0.01 0.
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-21 2015-01-28 2015-04-29 2015-04-29 2015-05-07 2015-05-13 2015-05-21 2015-05-28 2015-05-28 2015-06-11 2015-10-01 2015-10-08 2015-10-15 2015-10-28 2015-11-05 2015-11-05 2015-12-22 # Samples Average	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	TSS IDZ 3.0 3.0 3.0 3.0 3.0 7.3 10.0 3.0 7.3 10.0 3.0 <td< td=""><td>DN 3.0 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 20.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 16.0 96.0 20.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0</td><td>UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24 8.01 8.25 8.23 8.15 8.15 8.31 17 8.30 8.45</td><td>pH IDZ 8.24 8.35 8.23 8.42 8.34 8.40 8.48 8.45 8.41 8.36 8.27 8.39 8.31 8.15 8.17 8.25 8.27 8.29 8.27 18 8.29 8.48</td><td>DN 8.39 8.47 8.38 8.47 8.49 8.46 8.46 8.37 8.28 8.40 8.33 8.28 8.33 8.23 8.23 8.25 8.13 8.20 8.33 8.20 8.33 8.20 8.33</td><td>UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.43 1.43 1.43 1.43 1.03 1.10 2.11 2.25 2.12 2.09 2.21 1.72 1.89 1.72 1.89 17 1.66 2.25</td><td>N-NO₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28 2.15 2.17 2.22 1.52 1.68 18 2.71 13.00</td><td>DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.15 2.18 2.30 1.98 2.00</td><td>UP 0.01 0.</td><td>N-NO₂ IDZ 0.01</td><td>DN 0.01</td></td<>	DN 3.0 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 20.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 16.0 96.0 20.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24 8.01 8.25 8.23 8.15 8.15 8.31 17 8.30 8.45	pH IDZ 8.24 8.35 8.23 8.42 8.34 8.40 8.48 8.45 8.41 8.36 8.27 8.39 8.31 8.15 8.17 8.25 8.27 8.29 8.27 18 8.29 8.48	DN 8.39 8.47 8.38 8.47 8.49 8.46 8.46 8.37 8.28 8.40 8.33 8.28 8.33 8.23 8.23 8.25 8.13 8.20 8.33 8.20 8.33 8.20 8.33	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.43 1.43 1.43 1.43 1.03 1.10 2.11 2.25 2.12 2.09 2.21 1.72 1.89 1.72 1.89 17 1.66 2.25	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28 2.15 2.17 2.22 1.52 1.68 18 2.71 13.00	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.15 2.18 2.30 1.98 2.00	UP 0.01 0.	N-NO₂ IDZ 0.01	DN 0.01
Sample Date (yyyy-mm-dd) 2015-01-01 2015-01-07 2015-01-21 2015-01-28 2015-04-29 2015-05-07 2015-05-07 2015-05-13 2015-05-21 2015-05-28 2015-05-28 2015-06-11 2015-10-01 2015-10-08 2015-10-15 2015-10-22 2015-10-28 2015-11-05 2015-11-05 2015-12-22 # Samples Average Maximum	UP 3.0 3.0 - 3.3 3.0 4.7 11.3 3.0 9.3 72.0 22.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	TSS IDZ 3.0 3.0 3.0 3.0 7.3 10.0 3.0 7.3 10.0 3.0 24.7 3.0	DN 3.0 3.0 3.3 3.0 9.3 11.3 3.0 16.0 96.0 20.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	UP 8.37 8.43 - 8.44 8.41 8.36 8.45 8.40 8.32 8.24 8.35 8.24 8.35 8.24 8.35 8.24 8.35 8.23 8.15 8.15 8.31 17 8.30 8.45 8.45	pH IDZ 8.24 8.35 8.23 8.40 8.44 8.45 8.45 8.41 8.36 8.27 8.39 8.31 8.15 8.15 8.27 8.39 8.31 8.25 8.25 8.27 18 8.29 8.48 7.88 8.29 8.48 7.89	DN 8.39 8.47 8.38 8.47 8.49 8.46 8.46 8.37 8.28 8.40 8.33 8.28 8.33 8.23 8.23 8.25 8.13 8.20 8.33 8.20 8.33 8.26 8.33 8.20 8.33 8.33 8.33 8.20 8.33 8.20 8.33 8.33 8.33 8.20 8.33 8.33 8.33 8.33 8.33 8.20 8.33 8.34 8.33 8.34 8.	UP 1.35 1.80 - 1.91 1.32 1.12 1.43 1.43 1.45 1.33 1.03 1.10 2.11 2.25 2.12 2.09 2.21 1.72 1.89 1.72 1.89 1.72 1.66 2.25 1.02	N-NO ₃ IDZ 13.00 4.75 5.14 4.42 0.32 0.94 1.30 1.31 1.32 1.03 1.11 2.14 2.28 2.15 2.17 2.22 1.52 1.68 18 2.71 13.00 0.22	DN 1.47 1.80 0.79 1.94 1.59 1.31 1.49 1.54 1.40 1.05 1.14 2.15 2.18 2.30 1.98 2.00 18 1.70 2.30 0.79	UP 0.01 0.	N-NO₂ IDZ 0.01	DN 0.01

Light green squares show tests reported at less than the stated value, for calculations these are listed as equal to the value stated, ie. <0.05 is assumed to be 0.05 UP – Upstream IDZ – Initial Dilution Zone

DN – Downstream

6.0 OVERVIEW OF INFLUENT TEST RESULTS

This section provides data and analysis for the plant influent (raw sewage) samples taken during 2015.

Table 6 provides a summary record of the influent test results for the period January 1st, 2015 to December 22nd, 2015.

Data	2015 Influent Results Summary										
Date	Flow	Temp	рН	TSS	BOD	COD					
(yyyy/mm/dd)	m³/d	С		mg/L	mg/L	mg/L					
2015-01-01	673	-18.0	7.92	423	340	-					
2015-01-07	313	-12.0	7.79	217	252	-					
2015-01-14	169	-4.0	8.07	192	140	-					
2015-01-21	183	-9.0	8.16	175	161	-					
2015-01-28	255	-2.0	8.10	158	103	-					
2015-02-25	207	-6.0	7.92	98.2	93.5	-					
2015-04-29	117	4.0	7.38	112	234	-					
2015-05-07	94	5.0	7.94	48	78.9	-					
2015-05-13	120	7.0	7.83	54.7	57	-					
2015-05-21	112	10.0	7.96	69	96	-					
2015-05-28	102	13.0	7.71	70	95.4	-					
2015-06-11	137	17.0	7.81	213	196	-					
2015-07-30	268	10.0	8.08	138	92.6	-					
2015-08-27	256	20.0	7.73	24.6	95	-					
2015-10-01	101	3.0	7.64	32	84	-					
2015-10-08	178	15.0	7.78	61.3	45	-					
2015-10-15	259	0.0	7.84	92.5	67	-					
2015-10-22	102	-1.0	7.75	1970	1290	-					
2015-10-28	194	5.0	7.65	54.5	34	-					
2015-11-05	151	1.0	7.61	34	167	-					
2015-12-22	389	-5.0	7.94	52.7	271	-					
# Samples	21	21	21	21	21	0					
Average	209	2.5	7.8	204.3	190.1	-					
High	673	20	8	1970	1290	0					
Low	94	-18	7	25	34	0					

Table 6 2015 Influent Results

A total of 21 BOD and TSS samples were analyzed. Inlet BOD ranged from 34 mg/l to 1290 mg/L with an average of 190.1 mg/L. The average influent sewage strength was measured at 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. This can be caused by infiltration, leaking flow fixtures and so on. For that reason the flow saving measures effort should continue.

7.0 OVERVIEW OF EFFLUENT RESULTS

This section provides data and analysis for the effluent (treated) samples and plant flows for 2015.

A total of 386 effluent samples were collected and analyzed for TSS, 21 out of 386 samples were tested for BOD5, Total Phosphorus, Ortho Phosphate, Fecal Coliforms and 3 samples 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 2015.

Data			-		2015	Effluent	Results Su	mmary				
Date	Flow	Temp	NH ₃ -N	BOD	COD	P-OP04	Coliforms	Total P	TSS	рН	NO ₃ -N	NO ₂ -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
2015-01-01	673	-18.0	0.05	2.0	18	0.640	1	0.684	3.0	8.04	42.8	0.01
2015-01-07	305	-12.0	0.05	2.0	10	0.516	1	0.559	3.0	8.08	39.3	0.05
2015-01-14	167	-4.0	0.05	2.0	11	0.108	1	0.142	3.0	7.84	39.8	0.1
2015-01-21	173	-9.0	0.05	2.0	20	0.475	1	0.495	3.0	7.91	41.1	0.014
2015-01-28	263	-2.0	0.05	2.0	10	0.110	1	0.137	3.0	8.14	22.1	0.01
2015-02-25	220	-6.0	0.05	2.0	-	0.196	1	0.222	3.0	8.00	33.4	0.1
2015-04-29	112	4.0	0.05	2.0	10	0.181	1	0.221	3.0	7.70	28.1	0.024
2015-05-07	102	5.0	0.05	2.0	10	0.129	1	0.170	3.0	7.99	28.1	0.05
2015-05-13	120	7.0	0.05	2.0	10	0.105	1	0.139	3.0	7.86	21.5	0.017
2015-05-21	150	10.0	0.089	2.0	10	0.190	1	0.257	3.0	7.90	23.1	0.024
2015-05-28	102	13.0	0.05	2.0	10	0.114	1	0.148	3.0	7.99	18.0	0.016
2015-06-11	108	17.0	0.05	2.0	10	0.051	1	0.084	3.0	8.03	17.9	0.01
2015-07-30	303	10.0	0.05	2.0	-	0.105	1	0.149	3.0	8.06	21.1	0.01
2015-08-27	250	20.0	0.05	2.0	-	0.088	1	0.114	3.0	7.87	12.8	0.01
2015-10-01	113	3.0	0.05	2.0	10	0.064	1	0.061	3.0	8.10	20.3	0.018
2015-10-08	172	15.0	0.05	2.0	10	0.148	1	0.125	4.7	7.86	23.7	0.018
2015-10-15	252	0.0	0.05	2.0	13	0.467	10	0.505	3.0	7.98	21.3	0.013
2015-10-22	99	-1.0	0.05	2.0	10	0.033	1	0.045	3.0	7.95	22.8	0.021
2015-10-28	196	5.0	0.05	2.0	10	0.049	1	0.058	3.0	7.83	22.8	0.022
2015-11-05	156	1.0	0.05	6.6	10	0.092	1	0.290	3.0	7.84	10.3	0.063
2015-12-22	382	-5.0	0.05	2.0	18	0.616	1300	0.706	3.0	7.78	47.1	0.01
# Samples	21	21	21	21	18	21	21	21	21	21	21	21
Average	210	3	0.05	2.2	12	0.213	63	0.3	3	7.94	26.5	0.03
High	673	20	0.09	6.6	20	0.640	1300	0.7	5	8.14	47.1	0.10
Low	99	-18	0.05	2.0	10	0.033	1	0.0	3	7.70	10.3	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	3	1	0	0	N/A	N/A	N/A

Table 7 2015 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 2.2 mg/L, which was slightly higher than the previous years. This is the same as for 2014, 2013, 2012, 2011, 2010, 2009 and 2008. Laboratory tests indicated TSS samples averaged <3.0 mg/L with all the results but one (4.7 mg/L on Oct 8^{th}) 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 Feb 8^{th} at 3.9 mg/L with an average throughout the year of 0.80 mg/L. The plant provides excellent BOD₅ and TSS treatment with average removals of 100%.

Due to the relatively low levels of TSS, UV disinfection was able to effectively control the amount of coliform concentration found in the effluent. In general, the UV disinfection was able to keep the coliform levels well below the acceptable limits for recreational waters with the exception of one day, on Dec 22nd, the levels of coliforms were measured at 1300 cfu/100mL which exceeds the MSR discharge limits of 200 cfu/100mL. A new UV unit was installed in 2011. Although elevated coliforms were observed in the effluent on Dec. 22nd the levels were low in the Elk River on the same day. The days where coliforms were elevated in the Elk River, the levels were low in the effluent which indicates 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 2015 show that plant effluent is non-toxic. The results of these tests are shown below in Table 8.

Sample Date	Result
2015/01/08	Pass
2015/05/29	Pass
2015/11/06	Pass

Table 8 Toxicity Test Results

Three samples out of twenty-one for ortho phosphorus was slightly above MSR discharge limits (0.516 mg/L to 0.640 mg/L vs limit of 0.5 mg/L). Total phosphorus was below the MSR discharge limits for all twenty-one samples.

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.

Parameter	Unit	MSR Limit	No. of Samples	Average Value	Max. Value	Samples Over Limit
Flow	m ³ /day	1280	365	250	1,058	0
BOD₅	mg/l	45	21	2.2	6.6	0
TSS	mg/l	45	386	1.9	4.7	0
Total Phosphorous	mg/l	1	21	0.3	0.7	0
Ortho Phosphate	mg/l	0.5	21	0.213	0.640	3
Fecal Coliforms*	cfu/100ml	200	21	63	1300	1
96 hr LC₅₀ Bioassay	/	Non-toxic	3.0	/	/	0

<u>Table 9</u>
2015 MSR Parameter Compliance

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

The highest Fecal Coliforms recorded were on Dec 22^{nd} and were measured at 1300 cfu/100 mL; and this value exceeds the MSR discharge limits. The Elk River showed low levels of coliforms on the same day. The level was slightly elevated at the outlet (8 cfu/100mL) and low up-stream and downstream (1 and 3 cfu/100mL respectively) which indicates no measurable impact of the effluent discharge on the river.

The cause of the Fecal Coliforms spike was found to be malfunctioning UV bulbs. Replacement bulbs and quartz sleeves were ordered. Each train was extensively cleaned with a special cleaning fluid provided by the manufacturer. The problem was identified and dealt with immediately.

8.0 SLUDGE PRODUCTION AND DISPOSAL

This section provides data regarding the disposal of bio-solids (sludge) from the treatment facility in 2015.

Operation of the 200 m³ 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	207.20
February	190.80
March	177.40
April	140.00
Мау	94.20
June	123.20
July	109.50
August	132.10
September	54.20
October	70.30
November	87.70
December	113.50
Total	1.500.1

Table 10 2015 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.

9.0 BYPASS EVENTS

This section provides information about bypass events in 2015.

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 2015.

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.

At the time this report was prepared, there were no major plant improvements anticipated for 2016.

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 will continually monitor and optimize coagulant dosages for improved phosphorus removal.

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

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

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

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

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

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

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



Figure 8 Total Phosphorus Levels 2007-2015

Figure 9 Ortho Phosphorus Levels 2007-2015





Figure 10 Days over Limit 2007-2015

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 one instance, less than 2 mg/l. TSS was less than laboratory detection limit for all samples except one on Oct 8th when it was measured at 4.7 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 2015.

The highest fecal coliforms recorded were on Dec 22nd and were measured at 1300 cfu/100 mL; and this value exceeds the MSR discharge limits. The Elk River showed low levels of coliforms on the same day. The level was slightly elevated at the outlet (8 cfu/100mL) and low up-stream and downstream (1 and 3 cfu/100mL respectively) which indicates no measurable impact of the effluent discharge on the river.

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 Jan 1st, 3% on Jan 7th and 19% on Dec 22nd. There has been no measurable impact of phosphorus releases from the plant on Elk River background nutrient concentrations. Phosphorus concentrations were plotted against the flow level in the graph below. There is a correlation between the flow level with respect to the elevated phosphorus levels.



Figure 11 Total Flow and Phosphorus Levels

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 52 lot subdivision (Timberlanding) has been applied for and is currently under review by the Regional District of the East Kootenay and the Ministry of Transportation. Initial comments received from RCR include capacity confirmation for both the water and wastewater systems.

Details of the subdivision include 50 single family lots and 2 multi-family lots, each with an allowable density of approximately 56 units. There are no hotels proposed in the current subdivision.

While preliminary analysis indicates sufficient capacity in the existing systems to accommodate the development, it is anticipated some improvements will be required such as the upgrade of the sludge bagger to a more efficient system such as a centrifuge or press.

It should be noted that when the WWTP was upgraded in 2005, additional capacity was built into the plant which would allow it to operate to a maximum of 1760 m³ of daily flow. In order to utilize this additional capacity, a license amendment to increase the maximum allowable daily discharge from 1280 m³ to 1760 m³ would need to be made.

In summary, the activated sludge treatment process functioned well in 2015 with only, although significantly improved, phosphorus concerns outstanding. A program was installed in the summer of 2007 to address effluent phosphorous concentrations and will continue until positive results are consistently achieved.

13.0 AUTHORITIZATION AND CLOSING

This report, titled 2015 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

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



J:jobs/water/2016/W28001-RCR/Fernie/Wastewater/2015 Annual Report

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

Existing Development	Flow*		2011	2012	2013	2014	2015	2016
Existing Development	(l/unit/day)	Units	Generation (m3/day)					
Griz Inn	1136	45	51.1	51.1	51.1	51.1	51.1	51.1
Wolf's Den	318	42	13.4	13.4	13.4	13.4	13.4	13.4
Cornerstone	1136	26	29.5	29.5	29.5	29.5	29.5	29.5
Timberline Condos	1022	58	59.3	59.3	59.3	59.3	59.3	59.3
Polar Peaks (4-Plex Units)	1136	24	27.3	27.3	27.3	27.3	27.3	27.3
Timberline Single Family & B&B	1363	51	69.5	69.5	69.5	69.5	69.5	69.5
•	Subtotal	246	250.1	250.1	250.1	250.1	250.1	250.1

Infill Unito	Flow*		2011	2012	2013	2014	2015	2016
initii Onits	(l/unit/day)	Units	Generation (m3/day)					
Timberline Infills	1022	141	144.1	144.1	144.1	144.1	144.1	144.1
Timberline Single Family	1363	2	2.7	2.7	2.7	2.7	2.7	2.7
Timberline Infills	1022	106	108.3	108.3	108.3	108.3	108.3	108.3
Timberlanding Multifamily	1022	45	59.97	59.97	59.97	59.97	59.97	59.97
Timberlanding Single Family	1363	32.5	42.92	42.92	42.92	42.92	42.92	42.92
Highline Infill	1022	26	26.6	26.6	26.6	26.6	26.6	26.6
·	Subtotal	352.5	384.59	384.59	384.59	384.59	384.59	384.55

Highling Cubdivision	Flow*		2011	2012	2013	2014	2015	2016
Fignine Suburvision	(l/unit/day)	Units	Generation (m3/day)					
Single Family	1363	49	66.8	66.8	66.8	66.8	66.8	66.8
Duplexes	1363	10	13.6	13.6	13.6	13.6	13.6	13.6
Parcel 31-Condotel	318	61	19.4	19.4	19.4	19.4	19.4	19.4
Parcel 32-Duplex	1363	16	21.8	21.8	21.8	21.8	21.8	21.8
Parcel 36-Hotel	318	101	32.1	32.1	32.1	32.1	32.1	32.1
Parcel 37-Townhouses	1363	8	10.9	10.9	10.9	10.9	10.9	10.9
Parcel 38-Townhouses	1363	23	31.3	31.3	31.3	31.3	31.3	31.3
Parcel 3-Condominium	1363	12	16.4	16.4	16.4	16.4	16.4	16.4
Parcel 8-Condominium	1363	42	57.2	57.2	57.2	57.2	57.2	57.2
•	Subtotal	322	269.5	269 5	269 5	269 5	269 5	269 5

Day Lisors	Flow*	Population	2011	2012	2013	2014	2015	2016
Day Osers	(l/unit/day)	(each)	Generation (m3/day)					
Skiers	36	700	252	252	252	252	252	252
	Subtotal	700	252	252	252	252	252	252

Dining Excilitor/Parc	Flow*	Area	2011	2012	2013	2014	2015	2016
Dining Facilites/Bars	(I/m²/day)	(m2)	Generation (m3/day)					
Lizard Creek - Dining	97	54.7	5.3	5.3	5.3	5.3	5.3	5.3
Lizard Creek - Bar	145	40.4	5.9	5.9	5.9	5.9	5.9	5.9
Kelseys - Dining	97	204.4	19.8	19.8	19.8	19.8	19.8	19.8
Kelseys - Bar	145	65	9.4	9.4	9.4	9.4	9.4	9.4
Daylodge - Dining	97	358.6	34.8	34.8	34.8	34.8	34.8	34.8
Daylodge - Bar	145	260.7	37.8	37.8	37.8	37.8	37.8	37.8
Mean Bean	97	26.8	2.6	2.6	2.6	2.6	2.6	2.6
Gabrielles	97	133.8	13	13	13	13	13	13
Powder House Inn	97	232.2	22.5	22.5	22.5	22.5	22.5	22.5
Bears Den	97	62.4	6.1	6.1	6.1	6.1	6.1	6.1
·	Subtotal	1439	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
Corrected Daily Peak Flow Projections**	989 (actual)	811***(actual)	1181 (actual)	1036 (actual)	1058 (actual)	1120 (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

NO 125 P 2



Date: September 30, 2002

Our File: RE 17139

REGISTERED MAIL

Resorts of the Canadian Rockies Inc. PO Box 997 Victoria, BC VSW 258

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

Dear Sir:

Re: Registration under the *Municipal Sewage Regulation* of the discharge to the Elk River from the Fernie Alpine Resort sewage treatment plant located at District Lot 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 BOD₅ of 45 mg/L and a maximum TSS of 45 mg/L.

We wish to remind you that the discharger is responsible for compliance with the requirements of the *Regulation*, the registration, the *Waste Management Act* (the *Act*) and this registration letter. Your attention is respectfully directed to the terms and conditions outlined in the *Regulation*, the registration, this registration letter and the *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

Kootanay Region

Malling/Location Address: 401 • 383 Victoria Bireot Neleon BC VIL 4X3

Telephone: 260 954-6833 Facsimila: 250 864-6332 PF Facsimile:250 954-6367

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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 sewage discharges. If there are differences or omissions in this document then the Act, the regulations issued under the Act and the Regulation apply except where expressly noted in this letter.

Registration under the *Regulation* should not be construed as a representation that the 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.

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Registration Reference Documents

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

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

<u>Treatment Plant Works</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 asrated 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 Fornie Alpine Resort Wastewater Treatment Plant Expansion dated August, 2001 or on the attached Site Plan. The plant maximum daily flow and discharge to the environment is 1280 m³/day. The effluent quality shall be BODs of 45 mg/L, TSS of 45 mg/L, total phosphorus of 1.0 mg/L, onthe phosphate 0.5 mg/L and the effluent shall also pass a 96 hour LC50 bioassay test.

Primary Screenings and Dewatered Blosslids (Sindge) Dispesal

Primary screenings and dewatered biosolids (sludge) 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 Crowanest/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.

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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>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:

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Sampling and Analysis

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

Ammonia	5µg/L	(phus)
Nitrate	5 µg/L	- 14 - 1
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 Monitering and Receiving Environment Monitoring

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

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Sampling Location Frequency/Type

	Elk River ⁴ (At Sites UP, IDZ and DN)	Plant Influent ³	Plant Effluent ³
Parameter	·····		
pH (field test)	WS/G	-	M/G and WS/G
temperature (field test)	WS/G		
flow,		D/CON.	D/CON.
BOD ₅ ¹		M/G	M/G and WS/G
TSS ²	W8/G	M/G	M/G and WS/G and D/CON.
ammonia (as nitrogen)	WS/G		M/G and W\$/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 ⁴ (At Sites UP, IDZ and DN)	Piant Influent ³	Plant Effluent ³
orthophosphate	W\$/G		M/G and WS/G
fecal coliforms	WS/G		M/G and WS/G
Toxicity			3Y/G

1. BOD₅ - means the total 5-day 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.

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Sampling Location Frequency/Type

	Elk River ⁴ (At Sites UP, IDZ and DN)	Plant Influent ³	Plant Effluent ³
Parameter			
pH (field test)	WS/G		M/G and WS/G
temperature (field test)	WS/G		
flow,		D/CON,	D/CON.
BOD ₃ ¹		M/G	M/G and WS/G
TSS ²	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]	M/G and WS/G
total phosphorus	WS/G	1	M/G and WS/G
	Elk River ⁴ (At Sites UP, IDZ and DN)	Piant Influent ³	Plant Effluent ³
orthophosphate	W\$/G		M/G and WS/G
front colliforms	11/0		Alia and NISIA
Recar contorma	W 3/G		MIG and Mold
Toxicity			3Y/G

1. BOD₅ - means the total 5-day biochemical oxygen demand.

2. TSS - means total suspended solids or non-filterable residue.

- 3. Plant influent and effluent samples must be obtained at peak times on peak flow days. The peak flow days shall be based on bookings at the resort. An influent flow meter shall be installed on or before December 31, 2003.
- 4. Sampling of the Elk River shall be done on the same day as plant influent and effluent sampling and also correspond with peak flow days at the resort in a manner similar to plant influent/effluent sampling.

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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.

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URBANSYSTEMS LTD.

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.

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Supervisory Control and Data Acquisition (SCADA)

Monitoring Program Changes

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

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cc: Paul Bates, Resorts of the Canadian Rockies, Calgary Toby Todaro, Resorts of the Canadian Rockies, Calgary Etist 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:02-OCT-15Report Date:09-OCT-15 18:45 (MT)Version:FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1682334 Project P.O. #: NOT SUBMITTED Job Reference: FERNIE ALPINE RSORT - FALL 2015 EMS WK 1 C of C Numbers: Legal Site Desc:

Lyudmyla Shvets, B.Sc. Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1682334-1 WWTP INFLUENT							
Sampled By: BC on 01-OC1-15 @ 15:45							
Matrix: WATER							
Riscenaries Cyvgon Domand	01		75	ma/l		02 OCT 15	D2204077
Total Suspended Solids	04 22.0	DEITO	20	mg/L		02-0CT-15	R3204077
nH	7.64		0.10	nig/∟ nH		07-0CT-15	R3207095
	7.04		0.10			00-001-10	1(3207027
L 1002334-2 WWIP EFFLUENT Sampled By: BC on 01 OCT 15 @ 16:30							
Maultz. WATER Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	ma/L		09-OCT-15	R3286961
Biochemical Oxvgen Demand	<2.0		20	ma/L		02-OCT-15	R3284877
Chemical Oxygen Demand	<10		10	ma/L		09-OCT-15	R3287100
Orthophosphate-Dissolved (as P)	0.0639		0.0050	mg/L		03-OCT-15	R3283630
Coliform Bacteria - Fecal	<1		1	CFU/100mL		02-OCT-15	R3282633
Phosphorus (P)-Total	0.0607		0.0050	mg/L		09-OCT-15	R3286727
Total Suspended Solids	<3.0		3.0	mg/L		07-OCT-15	R3287095
рН	8.10		0.10	рН		09-OCT-15	R3287027
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	20.3		0.020	mg/L		02-OCT-15	R3285938
Nitrate+Nitrite	00.0		0.050			00 OCT 45	
Nitrate and Nitrite (as N)	20.3		0.050	mg/L		08-001-15	
Nitrite in Water by IC	0.018		0.010	ma/l		02-OCT-15	R3285938
1 1682334-3 ELK RIVER LIPSTREAM	0.010		0.010			02 001 10	1.0200000
Sampled By: BC on $01-OCT-15 \otimes 16^{\circ}20$							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		09-OCT-15	R3286961
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		03-OCT-15	R3283630
Coliform Bacteria - Fecal	<1		1	CFU/100mL		02-OCT-15	R3282633
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		09-OCT-15	R3286727
Total Suspended Solids	<3.0		3.0	mg/L		07-OCT-15	R3287095
pН	8.24		0.10	pН		09-OCT-15	R3287027
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	0 / /					00 00T 15	D
Nitrate (as N)	2.11		0.020	mg/L		02-001-15	R3285938
Nitrate+Nitrite (as N)	2 11		0.050	ma/l		08-OCT-15	
Nitrite in Water by IC	2.11		0.000	119/2			
Nitrite (as N)	<0.010		0.010	mg/L		02-OCT-15	R3285938
L1682334-4 ELK RIVER @ OUTFALL							
Sampled By: BC on 01-OCT-15 @ 16:10							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		09-OCT-15	R3286961
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		03-OCT-15	R3283630
Coliform Bacteria - Fecal	<1		1	CFU/100mL		02-OCT-15	R3282633
Phosphorus (P)-Total	0.0056		0.0050	mg/L		09-OCT-15	R3286727
Total Suspended Solids	<3.0		3.0	mg/L		07-OCT-15	R3287095

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 01-OCT-15 @ 16:10							
Matrix: WATER							
рН	8.31		0.10	pН		09-OCT-15	R3287027
NO2, NO3 and Sum of NO2/NO3							
Nitrate in water by IC Nitrate (as N)	2.14		0.020	mg/L		02-OCT-15	R3285938
Nitrate+Nitrite				Ū			
Nitrate and Nitrite (as N)	2.14		0.050	mg/L		08-OCT-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		02-OCT-15	R3285938
L1682334-5 ELK RIVER DOWNSTREAM							
Sampled By: BC on 01-OCT-15 @ 16:00							
Matrix: WATER							
Miscellaneous Parameters Ammonia, Total (as N)	<0.050		0.050	ma/l		09-OCT-15	P3286061
Orthophosphate-Dissolved (as P)	<0.050		0.0050	ma/L		03-OCT-15	R3283630
Coliform Bacteria - Fecal	<1		1	CFU/100mL		02-OCT-15	R3282633
Phosphorus (P)-Total	0.0069		0.0050	mg/L		09-OCT-15	R3286727
Total Suspended Solids	<3.0		3.0	mg/L		07-OCT-15	R3287095
рН	8.33		0.10	pН		09-OCT-15	R3287027
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	2 1/		0.020	mg/l		02-OCT-15	P3285038
Nitrate+Nitrite	2.14		0.020	iiig/L		02-001-13	10203930
Nitrate and Nitrite (as N)	2.14		0.050	mg/L		08-OCT-15	
Nitrite (as N)	<0.010		0.010	mg/L		02-OCT-15	R3285938

Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Rai	sed: Dilution required due to high concentration of	of test analyte(s).
MS-B	Matrix Spike recove	ery could not be accurately calculated due to high	n analyte background in sample.
Test Method	References:		
ALS Test Cod	le Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is oxygen demar dissolved oxyg BOD (CBOD)	s carried out using pro nd (BOD) are determin gen meter. Dissolved B is determined by addin	cedures adapted from APHA Method 5210B - "Bi ed by diluting and incubating a sample for a spec OD (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-CL	Water	Chemical Oxygen Demand	APHA 5220 D -Closed Reflux, Colorimetric
The Chemical contain a prem dichromate. Th Oxidizable org measured colo into the linear	Oxygen Demand (COI nixed volume of reager ne COD reagents also anic compounds react prmetrically and a decre range.	D) test is used to estimate the amount of organic hts. The sample is then heated for two hours on th contain silver and mercury ions. Silver is used as , reducing the dichromate ion to green chromic io ease 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 Coliform bacte involves an ini bacteria (Feca	s carried out using pro ria is enumerated by c tial 24 hour incubation I) and is used for non-1	cedures adapted from APHA Method 9222 "Mem ulturing and colony counting. A known sample vo at 44.5 degrees C of the filter with the appropriat urbid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". Iume is filtered through a 0.45 micron membrane filter. The test e growth medium. This method is specific for thermotolerant
N2N3-CALC-C	L Water	Nitrate+Nitrite	CALCULATION
NH4-CL	Water	APHA 4500 NH3F-Colorimetry	
Ammonia is de sample.	etermined using the Ph	enate colorimetric method. Result includes both	ionized (NH4+) and un-ionized (NH3) ammonia present in the
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anio	ns are analyzed 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 anio	ns are analyzed by lon	Chromatography with conductivity and/or UV de	tection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate di	s carried out using pro gestion of the sample.	cedures adapted from APHA Method 4500-P "Ph	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
PO4-DO-COL-	-CL Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrical	s carried out using pro lly on a sample that ha	cedures adapted from APHA Method 4500-P "Ph s 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 (TSS) are dete	s carried out using pro ermined by filtering a sa	cedures adapted from APHA Method 2540 "Solid ample through a glass fibre filter, and by drying th	ls". Solids are determined gravimetrically. Total suspended solids ne filter at 104 deg. C.
** ALS test meth	hods may incorporate i	nodifications from specified reference methods to	o improve performance.
The last two le	etters of the above test	code(s) indicate the laboratory that performed a	nalytical analysis for that test. Refer to the list below:
Laboratory De	efinition Code La	boratory Location	
CL	AL	S ENVIRONMENTAL - CALGARY, ALBERTA, C	ANADA

Chain of Custody Numbers:

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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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.

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FERNIE ALPINE RESORT UTILITIES CORPORATION

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ANALYSIS REQUESTED:

Ξ.

ATTN: PATRICK MAJER

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- pll Free: 1-800-668-9878 Fax: 403-291-0298
- IA: 1-800-667-7645 Fax: 306-668-8383

PAGE

OF

СОМ	PANY:	FERNIE ALF	PINE RESORT	UTILITIES CORPO	DRATION	ATTN:	PATRICK MAJER	AN	ALYS	SIS F	REQL	JEST	ED:								<u> </u>			
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PRO	JECT NAME A	ND NO.:	Fernie Alpine	Resort- Fall 2015 E	MS wk 1	QUOTE NO:] .																
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		WWTP Influ	ent BOD	2	2015-10-01	15:45	Water									х						33	°C	
		WWTP Effl	Jent Routine	3	2015-10-01	16:30	Water		ξ X ^s	X				2	:	u pr	X				1.381.1.	14.1	DC_	
	2	WWTP Effic	uent BOD	4	2015-10-01	16:30	Water									х						<u>14.</u> [<u>ک</u>	
			ent Nutrients	5	2015-10-01	16:30	Water				X	X	x	x	х						Ŀ	14.1	°C	
		WWTP Effil	uent Bacteriolo	gical 💪	2015-10-01	16:30	Water	x														14.1	20	
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ő		Elk River Ur	ostream Bacter	lological 9	2015-10-01	16:20	Water	×										<u> </u>	-359-5- -			<u> </u>	<u>C</u>	
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ЦЦ Д	/ \	Elk River @	Outfall Bacter	iological 12	2015-10-01	16:10	Water	×	ļ.,				[ļ								<u>9, 0</u>	<u>'C</u>	- <u>-</u>
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TUR	N AROUND R	EQUIRED:		NE 🔿 RUSH	SPECIFY DATE	:	(surcharge may apply)			AFL AFL	เหตุบา	SHED	BY:					<u>.</u>		RECE	EIVED	BY: D	<u>ate:</u> (rime: /	<u>x t 4</u> 12) (K
SEN	D INVOICE TO	D:	SAME A	S REPORT	FURENT FROM REP	OR'I (provide deta	ils below)			h.	INOLI	SUP) BY:		 C	ATE	2	2015-1	10-01	BEC	<i>ባራጉ</i> Elved	BY: C		
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SPE	CIAL INSTRU	CTIONS:	PLEASE FAX	A COPY OF THE	RESULTS TO 25	50-423-4652 OR	E-MAIL TO			FO	RLA	BUŚ	EO	NLY	•				à					
			wastewater@	eskifernie.com						Con	les Sa	ał inta	ct?		Sanı	ale Te	mpera	ilure:	<u>)</u>	'c	Coalin	ig Method	?	N
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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 16-OCT-15 Report Date: 23-OCT-15 18:51 (MT) Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1688947 Project P.O. #: NOT SUBMITTED Job Reference: FERNIE ALPINE RESORT- FALL 2015 EMS WK 3 C of C Numbers: Legal Site Desc:

Lyudmyla Shvets, B.Sc. Account Manager

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L1688947-1 WWTP INFLUENT Sampled By: BC on 15-OCT-15 @ 15:40 Image: Constraint of the constraint of t	
Sampled By: BC on 15-OCT-15 @ 15:40 Matrix: WATER Miscellaneous Parameters Biochemical Oxygen Demand 67 DLHC 20 mg/L 16-OCT-15 R329349. Total Suspended Solids 92.5 DLHC 5.0 mg/L 21-OCT-15 R329349. Total Suspended Solids 92.5 DLHC 5.0 mg/L 21-OCT-15 R329349. L1688947-2 WWTP EFFLUENT Sampled By: BC on 15-OCT-15 @ 15:45 Natrix: WATER Sapeded Solids 2.0 mg/L 21-OCT-15 R329349. Biochemical Oxygen Demand <2.0	
Matrix: WATER Miscellaneous Parameters 67 DLHC 20 mg/L 16-OCT-15 R329349- R329454 Total Suspended Solids 92.5 DLHC 5.0 mg/L 21-OCT-15 R329349- R329454 PH 7.84 0.10 PH 22-OCT-15 R329349- R329454 L1688947-2 WWTP EFFLUENT Sampled By: BC on 15-OCT-15 @ 15:45 F F F F R329349- R329541 Matrix: WATER WATER F F R329349- R329349- R329349- Chemical Oxygen Demand <20.0	
Miscellaneous Parameters Biochemical Oxygen Demand 67 DLHC 20 mg/L 16-OCT-15 R329349- R32949- 21-OCT-15 Total Suspended Solids 92.5 DLHC 5.0 mg/L 21-OCT-15 R329349- R329462- 21-OCT-15 R329349- R329462- 21-OCT-15 R329349- R329462- 21-OCT-15 R329349- R329462- 22-OCT-15 R329349- R329462- R32946- R32946- R32946- R32946- R329462- R32	
Biochemical Oxygen Demand 67 DLHC 20 mg/L 16-OCT-15 R329349- R329462 Total Suspended Solids 92.5 DLHC 5.0 mg/L 21-OCT-15 R329462 pH 7.84 0.10 pH 22-OCT-15 R329462 L1688947-2 WWTP EFFLUENT Sampled By: BC on 15-OCT-15 @ 15:45 R329541 Matrix: WATER WATER N Sampled By: BC on 15-OCT-15 @ 15:45 R329349 Miscellaneous Parameters - <td< td=""><td></td></td<>	
Total Suspended Solids 92.5 DLHC 5.0 mg/L 21-OCT-15 R3294624 pH 7.84 0.10 pH 22-OCT-15 R3295411 L1688947-2 WWTP EFFLUENT Sampled By: BC on 15-OCT-15 @ 15:45 Fright and the second secon	4
pH 7.84 0.10 pH 22-OCT-15 R329541 L1688947-2 WWTP EFFLUENT Sampled By: BC on 15-OCT-15 @ 15:45 Image: Content of the second se	4
L1688947-2 WWTP EFFLUENT Sampled By: BC on 15-OCT-15 @ 15:45 Matrix: WATER Miscellaneous Parameters 0.050 Ammonia, Total (as N) <0.050	1
Sampled By: BC on 15-OCT-15 @ 15:45 Image: boot of the second se	
Matrix: WATER Image: Miscellaneous Parameters Miscellaneous Parameters Image: Miscellaneous P	
Miscellaneous Parameters <	
Ammonia, Total (as N) <0.050	
Biochemical Oxygen Demand 1 2.0 mg/L 16-OCT-15 R3293494 Chemical Oxygen Demand 13 10 mg/L 22-OCT-15 R329164 Orthophosphate-Dissolved (as P) 0.467 DLA 0.025 mg/L 16-OCT-15 R329188 Coliform Bacteria - Fecal 10 OCR 1 CFU/100mL 16-OCT-15 R329188 Phosphorus (P)-Total 0.505 DLHC 0.025 mg/L 16-OCT-15 R329467 Total Suspended Solids <3.0	4
Cheminical Oxygen Demand 13 10 mg/L 22-0C1-15 R329564: Orthophosphate-Dissolved (as P) 0.467 DLA 0.025 mg/L 16-0CT-15 R329198: Coliform Bacteria - Fecal 10 OCR 1 CFU/100mL 16-0CT-15 R329169: Phosphorus (P)-Total 0.505 DLHC 0.025 mg/L 22-0CT-15 R329467: Total Suspended Solids <3.0	4
Of thiophidsphale-Dissolved (as P) 0.467 DLA 0.025 Hig/L 16-OCT-15 R3291964 Coliform Bacteria - Fecal 10 OCR 1 CFU/100mL 16-OCT-15 R3291504 Phosphorus (P)-Total 0.505 DLHC 0.025 mg/L 22-OCT-15 R3294624 Total Suspended Solids <3.0	5
Controlline Bacteria - Pedal 10 Cock 1 CFO/T00IIIL 16-OCT-15 R329150 Phosphorus (P)-Total 0.505 DLHC 0.025 mg/L 22-OCT-15 R329467 Total Suspended Solids <3.0	9
Total Suspended Solids <3.0	9
PH 7.98 0.10 PH 22-OCT-15 R3294024 NO2, NO3 (BC codes) and Sum of NO2/NO3 7.98 0.10 PH 22-OCT-15 R329541 Nitrate (as N) 21.3 0.020 mg/L 16-OCT-15 R3292035 Nitrate and Nitrite (as N) 21.3 0.050 mg/L 19-OCT-15	9
NO2, NO3 (BC codes) and Sum of NO2/NO3Nitrate (as N)0.020mg/L16-OCT-15R3292038Nitrate (as N)21.30.050mg/L19-OCT-15Nitrate and Nitrite (as N)21.30.050mg/L19-OCT-15	1
Nitrate (as N) Nitrate (as N)21.30.020mg/L16-OCT-15R3292038Nitrate+Nitrite Nitrate and Nitrite (as N)21.30.050mg/L19-OCT-15	'
Nitrate (as N) 21.3 0.020 mg/L 16-OCT-15 R3292038 Nitrate+Nitrite 21.3 0.050 mg/L 19-OCT-15 R3292038	
Nitrate+Nitrite21.30.050mg/L19-OCT-15	5
Nitrate and Nitrite (as N) 21.3 0.050 mg/L 19-OCT-15	
Nitrite in Water by IC Nitrite (as N) 0.013 0.010 mg/l 16-OCT_15 P3202020	5
Intellige Intellige <t< td=""><td>5</td></t<>	5
Sampled By: BC on 15-OCT-15 @ 15:55	
Matrix: WATER	
Miscellaneous Parameters	
Ammonia, Total (as N) <0.050 0.050 mg/L 21-OCT-15 R3293984	4
Orthophosphate-Dissolved (as P) <0.0050 0.0050 mg/L 16-OCT-15 R3291989	9
Coliform Bacteria - Fecal <1 CFU/100mL 16-OCT-15 R3291509	9
Phosphorus (P)-Total <0.0050 0.0050 mg/L 22-OCT-15 R3294679	9
Total Suspended Solids <3.0 3.0 mg/L 21-OCT-15 R3294624	4
pH 8.25 0.10 pH 22-OCT-15 R329541	1
NO2, NO3 (BC codes) and Sum of NO2/NO3	
Nitrate (as N)	_
Nitrate (as iv) 2.12 0.020 mg/L 16-0C1-15 R3292035	5
Nitrate and Nitrite (as N) 2.12 0.050 mo/L 19-OCT-15	
Nitrite in Water by IC	
Nitrite (as N) <0.010 mg/L 16-OCT-15 R3292035	5
L1688947-4 ELK RIVER @ OUTFALL	
Sampled By: BC on 15-OCT-15 @ 16:05	
Matrix: WATER	
Miscellaneous Parameters	
Ammonia, Total (as N) <0.050 0.050 mg/L 21-OCT-15 R3293984	4
Orthopnosphate-Dissolved (as P) <0.0050 0.0050 mg/L 16-OCT-15 R3291989	9
Collform Bacteria - Fecal 2 OCR 1 CFU/100mL 16-OCT-15 R3291509 Dispersion 2 000R 1 0.0001 100000 10000000 1000000 1000000 1000000 1000000 1000000 1000000 1000000 10000000 1000000 1000000 10000000 1000000 10000000 10000000 10000000 10000000 10000000 100000000 100000000 100000000 1000000000 1000000000 1000000000 10000000000 10000000000 100000000000000 100000000000000000000 1000000000000000000000000000000000000	9
Phosphorus (P)-10tal 0.0061 0.0050 mg/L 22-0CT-15 R3294679	9
Total Suspended Solids <3.0 3.0 Mg/L 21-0C1-15 R3294624	+

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 15-OCT-15 @ 16:05							
Matrix: WATER							
рН	8.17		0.10	рН		22-OCT-15	R3295411
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N)	0.45		0.000			16 OCT 15	D2000025
Nitrate+Nitrite	2.15		0.020	Ing/L		10-001-15	R3292035
Nitrate and Nitrite (as N)	2.15		0.050	mg/L		19-OCT-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		16-OCT-15	R3292035
L1688947-5 ELK RIVER DOWNSTREAM							
Sampled By: BC on 15-OCT-15 @ 16:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		21-OCT-15	R3293984
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		16-OCT-15	R3291989
Coliform Bacteria - Fecal	<1		1	CFU/100mL		16-OCT-15	R3291509
Phosphorus (P)-1 otal Total Supported Solida	<0.0050		0.0050	mg/∟		22-0CT-15	R3294679
	<3.0		3.0	nig/L		21-0CT-15	R3294624
NO2, NO3 (BC codes) and Sum of NO2/NO3	0.20		0.10	pri		22-001-15	K3295411
Nitrate (as N)							
Nitrate (as N)	2.15		0.020	mg/L		16-OCT-15	R3292035
Nitrate+Nitrite	0.45		0.050			40.007.45	
Nitrate and Nitrite (as N) Nitrite in Water by IC	2.15		0.050	mg/L		19-001-15	
Nitrite (as N)	<0.010		0.010	mg/L		16-OCT-15	R3292035

Sample Parameter Qualifier Key:

DLA	Detection Limit adjust	ed for required dilution	
DLHC	Detection Limit Raise	d: Dilution required due to high concentration of	f test analyte(s).
DLM	Detection Limit Adjust	ted due to sample matrix effects.	
OCR	Parameter is out of cl	ient specific range.	
Fest 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 proce (BOD) are determined n meter. Dissolved BOI determined by adding a	dures adapted from APHA Method 5210B - "Bic by diluting and incubating a sample for a specif D (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.
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D -Closed Reflux, Colorimetric
The Chemical O: contain a premix dichromate. The Oxidizable orgar measured colorr 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 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 ior se in absorbance at 420 nm is proportional to th	natter 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 o Coliform bacteria involves an initia bacteria (Fecal)	carried out using proceed a is enumerated by cult I 24 hour incubation at and is used for non-turk	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 oid 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
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
Ammonia is dete sample.	rmined using the Phen	ate colorimetric method. Result includes both i	onized (NH4+) and un-ionized (NH3) ammonia present in the
NO2-BC-IC-CL	Water	Nitrite in Water by IC	EPA 300.0
This analysis is o detected by UV a	carried out using procee absorbance.	dures adapted from EPA Method 300.0 "Determ	nination of Inorganic Anions by Ion Chromatography". Nitrite is
NO3-BC-IC-CL	Water	Nitrate (as N)	EPA 300.0
This analysis is o detected by UV a	carried out using procee absorbance.	dures adapted from EPA Method 300.0 "Determ	nination of Inorganic Anions by Ion Chromatography". Nitrate is
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is o persulphate dige	carried out using procee stion of the sample.	dures adapted from APHA Method 4500-P "Pho	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	pH	APHA 4500 H-Electrode
PO4-DO-COL-C	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 "Pho een lab or field filtered through a 0.45 micron n	psphorus". Dissolved Orthophosphate is determined nembrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is o (TSS) are detern	carried out using proceen 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 a 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 an	alytical analysis for that test. Refer to the list below:

CL ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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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.

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CHAIN OF CUSTODY FORM

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COMPANY:	FERNIE AL	PINE RESORT	UTILITIES (CORPORATION		ATTN:	PATRICK MAJER	AN	ALY	SIS P	REQU	JEST	ED:												
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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:23-OCT-15Report Date:30-OCT-15 17:10 (MT)Version:FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1692478 Project P.O. #: NOT SUBMITTED Job Reference: FERNIE ALPINE RESORT - FALL 2015 EMS WK 4 C of C Numbers: Legal Site Desc:

Lyudmyla Shvets, B.Sc. Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 22-OCT-15 @ 15:10							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	1290	DLHC	600	mg/L		23-OCT-15	R3298244
Total Suspended Solids	1970	DLHC	45	mg/L		28-OCT-15	R3299293
рН	7.75		0.10	pН		26-OCT-15	R3297387
L1692478-2 WWTP EFFLUENT							
Sampled By: BC on 22-OCT-15 @ 15:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		29-OCT-15	R3299408
Biochemical Oxygen Demand	<2.0		2.0	mg/L		23-OCT-15	R3298244
Chemical Oxygen Demand	<10		10	mg/L		30-OCT-15	R3300310
Orthophosphate-Dissolved (as P)	0.0330		0.0050	mg/L		24-OCT-15	R3296049
Coliform Bacteria - Fecal	<1		1	CFU/100mL		23-OCT-15	R3296911
Phosphorus (P)-Total	0.0452		0.0050	mg/L		30-OCT-15	R3299963
l otal Suspended Solids	<3.0		3.0	mg/L		28-OCT-15	R3299293
pH	7.95		0.10	рн		26-0CT-15	R3297387
Noz, NOS and Sull of NOZ/NOS							
Nitrate (as N)	22.8		0.020	mg/L		23-OCT-15	R3299070
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	22.8		0.050	mg/L		29-OCT-15	
Nitrite in Water by IC						00 0 0T 15	B
Nitrite (as N)	0.021		0.010	mg/L		23-001-15	R3299070
L1692478-3 ELK RIVER UPSTREAM							
Sampled By: BC on 22-001-15 @ 15:25							
Matrix: WATER							
Ammonia Total (as N)	<0.050		0.050	ma/l		29-0CT-15	R3200408
Orthophosphate-Dissolved (as P)	<0.050		0.000	mg/L		20 00T 10 24-0CT-15	R3296049
Coliform Bacteria - Fecal	1	OCR	1	CFU/100ml		23-0CT-15	R3296911
Phosphorus (P)-Total	< 0.0050		0.0050	mg/L		30-OCT-15	R3299963
Total Suspended Solids	<3.0		3.0	mg/L		28-OCT-15	R3299293
pH	8.23		0.10	pН		26-OCT-15	R3297387
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	2.09		0.020	mg/L		23-OCT-15	R3299070
Nitrate+Nitrite	2 09		0.050	ma/l		29-0CT-15	
Nitrite in Water by IC	2.00		0.000	ing/E		20 001 10	
Nitrite (as N)	<0.010		0.010	mg/L		23-OCT-15	R3299070
L1692478-4 ELK RIVER @ OUTFALL							
Sampled By: BC on 22-OCT-15 @ 15:35							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		29-OCT-15	R3299408
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		24-OCT-15	R3296049
Coliform Bacteria - Fecal	<1		1	CFU/100mL		23-OCT-15	R3296911
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		30-OCT-15	R3299963
i otal Suspended Solids	<3.0		3.0	mg/L		28-OCT-15	R3299293
				1			

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled Bv: BC on 22-OCT-15 @ 15:35							
Matrix: WATER							
рН	8.25		0.10	рН		26-OCT-15	R3297387
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	0.47					00 00T 45	D 00000 7 0
Nitrate (as N)	2.17		0.020	mg/∟		23-001-15	R3299070
Nitrate and Nitrite (as N)	2.17		0.050	mg/L		29-OCT-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		23-OCT-15	R3299070
L1692478-5 ELK RIVER DOWNSTREAM							
Sampled By: BC on 22-OCT-15 @ 15:45							
Matrix: WATER Miscellaneous Parameters							
Ammonia. Total (as N)	<0.050		0.050	ma/L		29-OCT-15	R3299408
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		24-OCT-15	R3296049
Coliform Bacteria - Fecal	<1		1	CFU/100mL		23-OCT-15	R3296911
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		30-OCT-15	R3299963
Total Suspended Solids	<3.0		3.0	mg/L		28-OCT-15	R3299293
рН	8.25		0.10	рН		26-OCT-15	R3297387
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	2 18		0 020	ma/l		23-0CT-15	R3299070
Nitrate+Nitrite	2.10		0.020	ing/L		20 001 10	10200070
Nitrate and Nitrite (as N)	2.18		0.050	mg/L		29-OCT-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	ma/l		23-0CT-15	R3200070
	-0.010		0.010	iiig/E		20 001 10	10200070

Sample Parameter Qualifier Key:

Qualifier	Description		
DLHC	Detection Limit Rais	ed: Dilution required due to high concentration o	of test analyte(s).
OCR	Parameter is out of	client specific range.	
Test Method R	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-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 proc (BOD) are determine n meter. Dissolved BC determined by adding	edures adapted from APHA Method 5210B - "Bi d by diluting and incubating a sample for a speci DD (SOLUBLE) is determined by filtering the sam a nitrification inhibitor to the diluted sample prio	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 r to incubation.
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D -Closed Reflux, Colorimetric
The Chemical O contain a premix dichromate. The Oxidizable organ measured colorr into the linear ra	exygen Demand (COD ed volume of reagent COD reagents also c nic compounds react, metrically and a decre- nge.) test is used to estimate the amount of organic s. The sample is then heated for two hours on th ontain silver and mercury ions. Silver is used as reducing the dichromate ion to green chromic io ase in absorbance at 420 nm is proportional to th	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 Coliform bacteria involves an initia bacteria (Fecal)	carried out using proc a is enumerated by cu al 24 hour incubation a and is used for non-tu	edures adapted from APHA Method 9222 "Mem Ituring and colony counting. A known sample vo It 44.5 degrees C of the filter with the appropriate Irbid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". lume 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
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
Ammonia is dete sample.	ermined using the Phe	enate colorimetric method. Result includes both	ionized (NH4+) and un-ionized (NH3) ammonia present in the
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	s are analyzed 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	s are analyzed by lon	Chromatography with conductivity and/or UV det	tection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate dige	carried out using procestion of 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
PO4-DO-COL-C	L Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using proc on a sample that has	edures adapted from APHA Method 4500-P "Ph 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 detern	carried out using proc mined by filtering a sa	edures adapted from APHA Method 2540 "Solid mple 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	ods may incorporate m	odifications from specified reference methods to) improve performance.
The last two lett	ers of the above test o	code(s) indicate the laboratory that performed ar	nalytical analysis for that test. Refer to the list below:
Laboratory Def	inition Code Lab	oratory Location	
CL	ALS	ENVIRONMENTAL - CALGARY, ALBERTA, CA	ANADA

Chain of Custody Numbers:

Test Method References:

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.

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L1692478-COFC

CHAIN OF CUSTODY FORM

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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 29-OCT-15 Report Date: 05-NOV-15 16:53 (MT) Version: FINAL

Client Phone: 403-254-8473

Certificate of Analysis

Lab Work Order #: L1695309 Project P.O. #: NOT SUBMITTED Job Reference: FERNIE ALPINE RESORT - FALL 2015 EMS WK 5 C of C Numbers: Legal Site Desc:

Lyudmyla Shvets, B.Sc. Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 28-OCT-15 @ 15:15							
Matrix: WATED							
Mainter Marcine Ma Artifica Marcine Ma							
Biochemical Oxygen Demand	34	DLHC	20	ma/L		30-OCT-15	R3305021
Total Suspended Solids	54.5	DLHC	5.0	mg/L		03-NOV-15	R3306295
рН	7.66		0.10	pH		04-NOV-15	R3306290
L1695309-2 WWTP EFFLUENT							
Sampled By: BC on 28-OCT-15 @ 15:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		31-OCT-15	R3302010
Biochemical Oxygen Demand	<2.0		2.0	mg/L		30-OCT-15	R3305021
Chemical Oxygen Demand	<10		10	mg/L		05-NOV-15	R3306377
Orthophosphate-Dissolved (as P)	0.0487		0.0050	mg/L		29-OCT-15	R3299961
Coliform Bacteria - Fecal	<1		1	CFU/100mL		29-OCT-15	R3304766
Phosphorus (P)-Total	0.0583		0.0050	mg/L		05-NOV-15	R3306121
Total Suspended Solids	<3.0		3.0	mg/L		03-NOV-15	R3306295
рН	7.83		0.10	рН		04-NOV-15	R3306290
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	22.8		0.020	ma/l		20-OCT-15	P3305001
	22.0		0.020	iiig/L		29-001-13	K3303091
Nitrate and Nitrite (as N)	22.8		0.050	mg/L		04-NOV-15	
Nitrite in Water by IC							
Nitrite (as N)	0.022		0.010	mg/L		29-OCT-15	R3305091
L1695309-3 ELK RIVER UPSTREAM							
Sampled By: BC on 28-OCT-15 @ 15:40							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	< 0.050		0.050	mg/L		31-OCT-15	R3302010
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		29-0CT-15	R3299961
Comorni Bacteria - Fecal	<1		1	CFU/TOUML		29-0C1-15	R3304766
Total Suspended Solids	<0.0050		3.0	mg/L		03-NOV-15	R3306205
nH	< 3.0 8 15		0.10	nig/∟ nH		03-NOV-15	R3306295
NO2. NO3 and Sum of NO2/NO3	0.15		0.10	pri		04-110 - 13	K3300290
Nitrate in Water by IC							
Nitrate (as N)	2.21		0.020	mg/L		29-OCT-15	R3305091
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	2.21		0.050	mg/L		04-NOV-15	
Nitrite in Water by IC	<0.010		0.010	ma/l		29-OCT-15	P3305001
	\$0.010		0.010	ing/L		20-001-10	10000001
L 1695309-4 ELK RIVER OUTFALL							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		31-OCT-15	R3302010
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		29-OCT-15	R3299961
Coliform Bacteria - Fecal	<1		1	CFU/100mL		29-OCT-15	R3304766
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		05-NOV-15	R3306121
Total Suspended Solids	<3.0		3.0	mg/L		03-NOV-15	R3306295
				-			

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 28-OCT-15 @ 15:50							
Matrix: WATER							
рН	7.88		0.10	pН		04-NOV-15	R3306290
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	2 22		0.020	ma/l		20-OCT-15	D3305001
Nitrate+Nitrite	2.22		0.020	ing/L		20-001-10	10000001
Nitrate and Nitrite (as N)	2.22		0.050	mg/L		04-NOV-15	
Nitrite in Water by IC			0.040			00 00T 45	D0005004
	<0.010		0.010	mg/L		29-001-15	R3305091
L1695309-5 ELK RIVER DOWINSTREAM							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		31-OCT-15	R3302010
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		29-OCT-15	R3299961
Coliform Bacteria - Fecal	<1		1	CFU/100mL		29-OCT-15	R3304766
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		05-NOV-15	R3306121
Total Suspended Solids	<3.0		3.0	mg/L		03-NOV-15	R3306295
pH NO2_NO3 and Sum of NO2/NO3	8.13		0.10	рН		04-NOV-15	R3306290
Noz, Nos and Sull of Noz/Nos							
Nitrate (as N)	2.30		0.020	mg/L		29-OCT-15	R3305091
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	2.30		0.050	mg/L		04-NOV-15	
Nitrite (as N)	<0.010		0.010	mg/L		29-OCT-15	R3305091

Sample Parameter Qualifier Key:

-

Test Method Reference	s:								
ALS Test Code	Matrix	Test Description	Method Reference**						
BOD-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 procee determined issolved BOI d by adding a	dures adapted from APHA Method 5210B - "Biod by diluting and incubating a sample for a specifie O (SOLUBLE) is determined by filtering the samp a nitrification inhibitor to the diluted sample prior f	themical Oxygen Demand (BOD)". All forms of biochemical ad time period, and measuring the oxygen depletion using a le through a glass fibre filter prior to dilution. Carbonaceous to incubation.						
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D -Closed Reflux, Colorimetric						
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+ measured colormetrically and a decrease in absorbance at 420 nm is proportional to the COD. Samples with concentrations > 150 mg/L can be diluminto the linear range.									
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D						
This analysis is carried out Coliform bacteria is enume involves an initial 24 hour i bacteria (Fecal) and is use	using procee erated by cult ncubation at d for non-turk	dures adapted from APHA Method 9222 "Membr uring and colony counting. A known sample volu 44.5 degrees C of the filter with the appropriate o bid 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						
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry						
Ammonia is determined us sample.	ing the Phen	ate colorimetric method. Result includes both io	nized (NH4+) and un-ionized (NH3) ammonia present in the						
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)						
Inorganic anions are analy	zed by lon C	hromatography with conductivity and/or UV deter	ction.						
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)						
Inorganic anions are analy	zed by lon C	hromatography with conductivity and/or UV deter	ction.						
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS						
This analysis is carried out persulphate digestion of th	using procee e sample.	dures adapted from APHA Method 4500-P "Phos	phorus". Total Phosphorus is determined colourimetrically after						
PH-CL	Water	рН	APHA 4500 H-Electrode						
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS						
This analysis is carried out colourimetrically on a sam	t using proced ple that has b	dures adapted from APHA Method 4500-P "Phos been 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 fi	using procee Itering 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 filter at 104 deg. C.						
** ALS test methods may inc	corporate mo	difications from specified reference methods to in	mprove 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**
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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.

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Vancouver BC, 1988 (EU app. Stepp), VSL 1K5 (Fe), 500-22 (1916), Teo, Frey 1-800-665-0243 Fax, 604-253 6700 Fort St. John BC, Box 256, 9831 (98A Average 1916), W7 (1997), 250 261-551 (1710), 050 051 551

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L1695309-COFC

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SEND REPORT TO:

CHAIN OF CUSTODY FORM

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	1	WWTP influ	ient BOD	2	2015-10-28	15:15	Water									X						12.6°C	
	(WWTP Effi	iont Routine	3	2015-10-28	15-30	Water		Х	X					~		X					13.5°C	
	ון	WWTP Effic	uent BOD	4	2015-10-28	15:30	Water									х						13.5°C	
	$\underline{\langle}$	WWTP Effic	uent Nutrienis	5	- 2015-10-28	15:30	Water				X	х	X	X	x			·				13.5 °C	
		WWTP Effic	uent Bacteriolog	jical 6	2015-10-28	15.70	Water	X	<u> </u>													13.5°C	
-132- 1	(Eik River Up	ostream (Routin	- 7	* 2015-10-28	15:40	Water	57. 14.84	X ,	X	and the Local data	 				5. 	. 1541. 1818 - 191	s Status		. se Literati	. Sý	5.2 °C	
۲	$\overline{\mathbf{S}}$	Eik River Up	ostream Nutrier	its 8	2015-10-28	15:40	Water				х	x	х	х	х							5.2°C	
ð		Elk River Ur	ostream Bacieri	ological S	2015-10-28	15:40	Water	X														<u>5.2°C</u>	
ŝ	/.	Elk River @	Outfall Routine	<u> </u>	2015-10-28	15:50	Water		×	x												<u>5.3°C</u>	
AB AB	41	Elk River @	Outfall Nutrien	ts // 💉	2015-10-28	15.50	Water			an a	x	X	X	۲X.	Х,	<u>.</u>	ereter Anti-					<u>5.3°C</u>	
Ē		Elk River @	Outfall Bacteri	ological 12	2015-10-28	15:50	Water	X	<u> </u>													<u>5.3°C</u>	
μĽ		Elk River De	ownstream Rou	tine 13	2015-10-28	16:00	Water		X	X		_	r									5.1°C	
51 M		Elk River Do	ownstream Nuti	ients 17	2015-10-28	16:00	Water				x	X	X	x	х	_						<u>5.1°C</u>	
		Elk River Do	ownstream Bac	teriological K	2015-10-28	16:00	Waler	X	anara.					;	4	*		3			a.	5.1°C	
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	wastewater@skifernie.com									Cost		s Intac No	a? N	1/A	Samp Froze	n?	mperat Yes		<u>2_</u> ⁰	с		ig Method? epacksNoneNone	
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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 06-NOV-15 Report Date: 16-NOV-15 16:48 (MT) Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1699372 Project P.O. #: NOT SUBMITTED Job Reference: FERNIE ALPINE RESORT - FALL 2015 EMS WK 6 C of C Numbers: Legal Site Desc:

Lyudmyla Shvets, B.Sc. Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 05-NOV-15 @ 16:50							
Matrix ⁻ WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	167	DLHC	75	mg/L		06-NOV-15	R3310387
Total Suspended Solids	34.0	DLM	5.0	mg/L		12-NOV-15	R3311184
рН	7.61		0.10	pН		13-NOV-15	R3312077
L1699372-2 WWTP EFFLUENT							
Sampled By: BC on 05-NOV-15 @ 16:55							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		13-NOV-15	R3311027
Biochemical Oxygen Demand	6.6	BODP	6.0	mg/L		06-NOV-15	R3310387
Chemical Oxygen Demand	<10		10	mg/L		14-NOV-15	R3311934
Orthophosphate-Dissolved (as P)	0.0916		0.0050	mg/L		07-NOV-15	R3307354
Coliform Bacteria - Fecal	<1		1	CFU/100mL		06-NOV-15	R3308142
Phosphorus (P)-Total	0.290	DLA	0.025	mg/L		16-NOV-15	R3312128
Total Suspended Solids	<3.0		3.0	mg/L		12-NOV-15	R3311184
pH	7.84		0.10	рН		13-NOV-15	R3312077
NO2, NO3 and Sum of NO2/NO3							
Nitrate in water by IC Nitrate (as N)	10.3		0 020	ma/l		07-NOV-15	R3311866
	10.0		0.020	ing/E		07 110 10	1000
Nitrate and Nitrite (as N)	10.4		0.050	mg/L		16-NOV-15	
Nitrite in Water by IC							
Nitrite (as N)	0.063		0.010	mg/L		07-NOV-15	R3311866
L1699372-3 ELK RIVER UPSTREAM							
Sampled By: BC on 05-NOV-15 @ 17:05							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		13-NOV-15	R3311027
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		07-NOV-15	R3307354
Coliform Bacteria - Fecal	1	OCR	1	CFU/100mL		06-NOV-15	R3308142
Phosphorus (P)-Total	0.0056		0.0050	mg/L		16-NOV-15	R3312128
l otal Suspended Solids	<3.0		3.0	mg/L		12-NOV-15	R3311184
pH NO2 NO2 and Sum of NO2/NO2	8.15		0.10	рн		13-NOV-15	R3312077
Nitrate in Water by IC							
Nitrate (as N)	1.72		0.020	mg/L		07-NOV-15	R3311866
Nitrate+Nitrite				Ū			
Nitrate and Nitrite (as N)	1.72		0.050	mg/L		16-NOV-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		07-NOV-15	R3311866
L1699372-4 ELK RIVER @ OUTFALL							
Sampled By: BC on 05-NOV-15 @ 17:10							
Matrix: WATER							
Miscellaneous rarameters	-0.050		0.050	mc/l		12 NOV 45	D2214007
Annollia, Tolai (as N) Orthonhosphato Dissolved (as D)	<0.050		0.050	mg/L		13-NOV-15	R331102/
Coliform Bacteria Eccal	10000		0.0050 1	CELI/100ml		07-NOV-15	R330/354
Dhosphorus (D)-Total				mc/l		16-NOV-15	D2212120
Total Suspended Solids	CUOU.U		00000	mg/L		12-NOV-15	D3311104
	-5.0		5.0	iiig/L		12-110 - 13	1.0011104

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 05-NOV-15 @ 17:10							
Matrix: WATER							
pH	8.25		0.10	pН		13-NOV-15	R3312077
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	4.50		0.000			07 NOV 45	D0044000
Nitrate (as N)	1.52		0.020	mg/L		07-NOV-15	R3311866
Nitrate and Nitrite (as N)	1.52		0.050	mg/L		16-NOV-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		07-NOV-15	R3311866
L1699372-5 ELK RIVER DOWNSTREAM							
Sampled By: BC on 05-NOV-15 @ 17:15							
Matrix: WATER Miscellaneous Parameters							
Ammonia. Total (as N)	<0.050		0.050	ma/L		13-NOV-15	R3311027
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		07-NOV-15	R3307354
Coliform Bacteria - Fecal	<1		1	CFU/100mL		06-NOV-15	R3308142
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		16-NOV-15	R3312128
Total Suspended Solids	<3.0		3.0	mg/L		12-NOV-15	R3311184
рН	8.20		0.10	рН		13-NOV-15	R3312077
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	1 98		0 020	ma/l		07-NOV-15	R3311866
Nitrate+Nitrite	1.00		0.020	iiig/L		0/ 100 10	10011000
Nitrate and Nitrite (as N)	1.98		0.050	mg/L		16-NOV-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	ma/l		07-NOV-15	R3311866
	-0.010		0.010				10011000

Sample Parameter Qualifier Key:

Qualifier	Description									
BODP	BOD dilution results differed by more than 30% RPD. Precision of reported BOD result may be less than usual.									
DLA	Detection Limit adjusted for required dilution									
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).									
DLM	Detection Limit Adjusted due to sample matrix effects.									
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.									
OCR	Parameter is out of client specific range.									
Test Method Re	eferences:									
ALS Test Code	Matrix	Test Description	Method Reference**							
BOD-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-CL	Water	Chemical Oxygen Demand	APHA 5220 D -Closed Reflux, Colorimetric							
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	-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									
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry							
Ammonia is dete sample.	rmined using the Phen	ate colorimetric method. Result includes both ic	onized (NH4+) and un-ionized (NH3) ammonia present in the							
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 dete	ection.							
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)							
Inorganic anions	are analyzed by lon Cl	nromatography with conductivity and/or UV dete	ection.							
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS							
This analysis is c persulphate dige	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	рН	APHA 4500 H-Electrode							
PO4-DO-COL-CI	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS							
This analysis is c colourimetrically	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 c (TSS) are determ	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

L1699372 CONTD.... PAGE 5 of 5 Version: FINAL

Test Method References:

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

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.



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SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE

OF

CON	IPANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION			ANALYSIS REQUESTED:																		
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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 28-AUG-15 Report Date: 04-SEP-15 14:08 (MT) Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1664741 Project P.O. #: NOT SUBMITTED Job Reference: WASTEWATER - AUGUST 2015 MONTHLY EMS C of C Numbers: Legal Site Desc:

Lyudmyla Shvets, B.Sc. Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BO CHOROSZWESKI on 27-AUG-15 @	16:30						
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	95		75	mg/L		28-AUG-15	R3259086
Total Suspended Solids	24.6	DLM	4.0	mg/L		02-SEP-15	R3259513
рН	7.73		0.10	pН		02-SEP-15	R3258717
L1664741-2 WWTP EFFLUENT							
Sampled By: BO CHOROSZWESKI on 27-AUG-15 @	16:20						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-AUG-15	R3256481
Biochemical Oxygen Demand	<2.0		2.0	mg/L		28-AUG-15	R3259086
Orthophosphate-Dissolved (as P)	0.0878		0.0050	mg/L		28-AUG-15	R3255831
Coliform Bacteria - Fecal	<1		1	CFU/100mL		28-AUG-15	R3257049
Nitrate (as N)	12.8		0.020	mg/L		29-AUG-15	R3257446
Nitrate and Nitrite (as N)	12.8		0.050	mg/L		01-SEP-15	
Nitrite (as N)	<0.010		0.010	mg/L		29-AUG-15	R3257446
Phosphorus (P)-Total	0.114		0.0050	mg/L		04-SEP-15	R3260205
	<3.0		3.0	mg/∟		02-SEP-15	R3259513
рп 	1.87		0.10	рн		02-SEP-15	R3258/1/

Sample Parameter Qualifier Key:

Qualifier	Description									
DLM	Detection Limit Adjusted due to sample matrix effects.									
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 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							
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry							
Ammonia is dete sample.	Ammonia is determined using the Phenate colorimetric method. Result includes both ionized (NH4+) and un-ionized (NH3) ammonia present in the sample.									
NO2-BC-IC-CL Water Nitrite in Water by IC EPA 300.0										
This analysis is o detected by UV a	arried out using proc absorbance.	edures adapted from EPA Method 300.0 "Dete	rmination of Inorganic Anions by Ion Chromatography". Nitrite is							
NO3-BC-IC-CL Water Nitrate (as N) EPA 300.0		EPA 300.0								
This analysis is o detected by UV a	arried out using proc absorbance.	edures adapted from EPA Method 300.0 "Dete	rmination of Inorganic Anions by Ion Chromatography". Nitrate is							
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS							
This analysis is on persulphate dige	arried out using proc stion of the sample.	edures adapted from APHA Method 4500-P "P	hosphorus". Total Phosphorus is determined colourimetrically after							
PH-CL	Water	рН	APHA 4500 H-Electrode							
PO4-DO-COL-CI	_ Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS							
This analysis is c colourimetrically	arried out using proc on a sample that has	edures adapted from APHA Method 4500-P "P been lab or field filtered through a 0.45 micron	hosphorus". Dissolved Orthophosphate is determined membrane filter.							
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric							
This analysis is c (TSS) are detern	arried out using proc hined by filtering a sa	edures adapted from APHA Method 2540 "Soli mple through a glass fibre filter, and by drying t	ds". Solids are determined gravimetrically. Total suspended solids he filter at 104 deg. C.							
** ALS test metho	ds may incorporate m	nodifications 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 Defi	nition Code Lab	oratory Location								
CL	ALS	ENVIRONMENTAL - CALGARY, ALBERTA, C	CANADA							

Chain of Custody Numbers:
Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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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 Equironmental

1.2 TREAT OF CMILLON A DIFFERENCE REPORTS

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Yes No N/A

Frozen?

Yes

No

4-253-6700

0-513-2191

-437-2311 ax: 403-291-0298

-06-668-8383

CHAIN OF CUSTODY FORM SEND REPORT TO: PAGE OF FERNIE ALPINE RESORT UTILITIES CORPORATION PATRICK MAJER ANALYSIS REQUESTED: COMPANY: ATTN: 1505 - 17 TH AVENUE SOUTH WEST ADDRESS: N. PROV. ALBERTA CALGARY T2T 0E2 POSTAL CODE: νų, SAMPLER: Bo Choroszewski 403 - 256 - 8473 FAX: 403 - 244 - 3774 Wastewater -August 2015 Monthly EMS PROJECT NAME AND NO .: QUOTE NO: . 303 ALS CONTACT: Lyudmyla Shvets pmajer@skircr.com HARDCOPY I√ EMAIL - ADDRESS: $\hat{\boldsymbol{x}}_{ij} = \left\{ \boldsymbol{y}_{ij}^{(i)} \right\}$ 5. GE Coliferns $\{t_{ij}\}$. REPORT FORMAT: FAX PDF EXCEL OTHER: N-SON ા પ્રાપ્ય ۵. NO2-N WO# ۵ N-CHN 80D5 DATE / TIME COLLECTED Fecal Ortho Total F NOTES (sample specific 00 SAMPLE IDENTIFICATION MATRIX TSS Ha comments, due dates, etc.) YYYY-MM-DD TIME 1.14 16:30 X WWTP Influent Routine Water X. 2015-08-27 16:30 WWTP Influent BOD 2015-08-27 Water х Tor 2 10:20 WWTP Effluent Routine Water х Х 2015-08-27 0 WWTP Effluent 600 16:20 Water Х 3 2015-08-27 16:20 WWTP Effluent Nutrients X х х 2015-08-27 Water x х 16:20 WWTP Effluent Bacteriological Water х 2015-08-27 15. section all in the second seco 結合な感染があると The Art of 1. ÷Ę. 16 A 34 وشد^{ان} 12 من Administration and the Charling and the state of a street mail you will a she way to re-الملألا . 33 na he water de complete en recented anna a che decembra i85 ani a ands - 1 and as a set of the relation - 1167 (a garage and garage กระนุรุง เวลตาลาเราสูญห. en producer en organig 10.1 M sub 1919.9-14 21229 846 and have a second and the second s The second sec Start of groups. The second s 200 i (del) General in the second · 嗯呀!"""你说,我你知道了我,你那些你没有吗?""你说……" . . . O RUSH DATE RECEIVED BY: DATE: ® ROUTINE SPECIFY DATE: (surcharge may apply) REDNOUISHED BY: TURN AROUND REQUIRED: BM HUNGRY BAYTALUKE TIME TIME: 2015-08-27 RECEIVED BY: DIFFERENT FROM REPORT (provide details below) SEND INVOICE TO: SAME AS REPORT RELINQUISHED BY: DATE: DATE: BO CHOROSZEWSKI INVOICE FORMAT: DPDF FAX HARDCOPY 17:00 TIME: TIME: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO SPECIAL INSTRUCTIONS: FOR LAB USE ONLY wastewater@skifernic.com Sample Temperature: °C Cooler Soal Intect? Cooling Method?

G -QUALITY/00_DOCUMENTS/10_AUTHORIZED/FORMS/CoC for ALS Plant EMS xis

_lcepacks _

lce

None



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:26-FEB-15Report Date:03-MAR-15 16:18 (MT)Version:FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1581788

Project P.O. #: Job Reference: NOT SUBMITTED WASTEWATER - FEBRUARY 2015 MONTHLY EMS

C of C Numbers: Legal Site Desc:

Lyudmyla Shvets Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
1 1581788-1 WWTP INFLUENT							
Sampled By: BC on 25-FEB-15 @ 15:40							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	93.5	BODQ	2.0	mg/L		26-FEB-15	R3154445
Total Suspended Solids	98.2		5.0	mg/L		26-FEB-15	R3153104
рН	7.92		0.10	pН		27-FEB-15	R3153276
L1581788-2 WWTP EFFLUENT							
Sampled By: BC on 25-FEB-15 @ 15:45							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		27-FEB-15	R3153304
Biochemical Oxygen Demand	<2.0		2.0	mg/L		26-FEB-15	R3154445
Onnophosphate-Dissolved (as P)	0.196		0.050	mg/L		27-FEB-15	R3153283
Docharus (P) Total	1		1	GFU/TUUML		20-FEB-15	KJ 153218
Thospholus (P)-Total Total Suspended Solids	0.222	DLA	0.050	mg/L		20-FEB-10	R315339/
	< 3.0		3.0	nig/L		20-FED-15	R3153104
NO2 NO3 and Sum of NO2/NO3	8.00		0.10	рп		27-FED-15	R3153270
Nitrate in Water by IC							
Nitrate (as N)	33.4	DLA	0.20	mg/L		26-FEB-15	R3152701
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	33.4		0.22	mg/L		26-FEB-15	
Nitrite in Water by IC	-0.10		0.10	ma/l		26 EED 15	D2152701
	<0.10	DLA	0.10	IIIg/L		20-FEB-15	R3152701

Sample Parameter Qualifier Key:

Qualifier	Description
BODQ	BOD Qualification: Lab Control Sample outside standard 85-115% objective (see QC report). Sample(s) cannot be rerun due to hold time expiry.
DLA	Detection Limit adjusted for required dilution
LCS-L	Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
OCR	Parameter is out of client specific range.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**									
BOD-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 procee determined issolved BOI d by adding a	dures adapted from APHA Method 5210B - "Bioc by diluting and incubating a sample for a specifie D (SOLUBLE) is determined by filtering the samp a 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.									
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									
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry									
Ammonia is determined using the Phenate colorimetric method. Result includes both ionized (NH4+) and un-ionized (NH3) ammonia present in the sample.												
NO2-IC-N-CL	EPA 300.1 (mod)											
sample. 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)												
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)									
Inorganic anions are analy	sis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical mand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a xygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous DD is determined by adding a nitrification inhibitor to the diluted sample prior to incubation. L Water Fecal Coliform Count-MF APHA 9222D sis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group", acteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test i nitial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant eacily and is used for non-turbul water with a low background bacteria level. C-CL Water Nitrate+Nitrite CALCULATION Water Ammonia-N APHA 4500 NH3F-Colorimetry s determined using the Phenate colorimetric method. Result includes both ionized (NH4+) and un-ionized (NH3) ammonia present in the CL Water Nitrate in Water by IC EPA 300.1 (mod) nions are analyzed by lon Chromatography with conductivity and/or UV detection. CL Water Total P in Water by Clour APHA 4500 PPHOSPHORUS sis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after e digestion of the sample. Water PH AptA 14 Method 250-P "Phosphorus". Total Phosphorus is determined colourimetrically after e digestion of the sample. Water Diss. Orthophosphate in Water by Colour APHA 4500 PHOSPHORUS sis is carried out using procedures adapted from APHA Method 2500-P "Phosphorus". Dissloved Orthophosphate is determined traily on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Water Total Suspended Solids APHA 2540 D-Gravimetric											
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS									
This analysis is carried out persulphate digestion of th	using proce e sample.	dures adapted from APHA Method 4500-P "Phos	phorus". Total Phosphorus is determined colourimetrically after									
PH-CL	Water	рН	APHA 4500 H-Electrode									
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS									
This analysis is carried out colourimetrically on a same	using proce	dures adapted from APHA Method 4500-P "Phos been lab or field filtered through a 0.45 micron me	phorus". Dissolved Orthophosphate is determined mbrane 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 sam	dures adapted from APHA Method 2540 "Solids". ple through a glass fibre filter, and by drying the f	Solids are determined gravimetrically. Total suspended solids ilter at 104 deg. C.									
** ALS test methods may inc	corporate mo	difications from specified reference methods to ir	nprove 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**
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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.

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L1581788-COFC

CHAIN OF CUSTODY FORM

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TEL:		403 - 256 - 1	8473	FAX: 403 - 24	14 - 3774	SAMPLER:	Bo Choroszewski	***		3Mé		38 19 19		1		8 8 .55		Sheek.		'અંગ્રહે! ર			
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G. DUALITY 10. DOCUMENTS/10, AUTHORIZED FORMS/CoC for ALS Plant EMS xis



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:31-JUL-15Report Date:07-AUG-15 15:55 (MT)Version:FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1651065 Project P.O. #: NOT SUBMITTED Job Reference: WASTEWATER - JULY 2015 MONTHLY EMS C of C Numbers: Legal Site Desc:

Lyudmyla Shvets, B.Sc. Account Manager

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L1651065-1 WWTP INFLUENT Sampled By: BO CHOROSZEWSKI on 30-JUL-15 @ 15:15 Matrix: WATER Miscellaneous Parameters Biochemical Oxygen Demand 11651065-2 WWTP EFFLUENT Sampled By: BO CHOROSZEWSKI on 30-JUL-15 @ 15:20 Matrix: WATER Miscellaneous Parameters Ammonia, Total (as N) Othophosphate-Dissolved (as P) Othophosphate-Dissolved (as P) Othophosphate-Dissolved (as P) Othophosphate-Dissolved (as P) Nitrate (as N) Nitrate (as N) Nitrate (as N) Nitrate (as N) Phereical Oxygen Demand Solution Othophosphate-Dissolved (as P) Nitrate (as N) Nitrate (as N) Phosphorus (P)-Total Othophosphate Solids Sol	WWTP INFLUENT Site Image: Site Site Image: Site Site Image: Site	 R3238969 R3242167 R3237080 R3239493 R3238969 R3237369 R3237263 R3238548 E3236548
Exonologity BO CHOROSZEWSKI on 30-JUL-15 @ 15:15 Matrix: WATER Miscellaneous Parameters 92.6 Biochemical Oxygen Demand 92.6 pH 8.08 DLM 6.0 miscellaneous Parameters 0.10 pH 8.08 DLM 6.0 mgrL 06-AUG-15 pH 8.08 DLM 6.0 mgrL 06-AUG-15 Sampled By: BO CHOROSZEWSKI on 30-JUL-15 @ 15:20 Matrix: WATER Miscellaneous Parameters Ammonia, Total (as N) Ammonia, Total (as N) <0.050	WATTER BO CHOROSZEWSKI on 30-JUL-15 @ 15:15 Z.0 mg/L 3 watter aage and the second of t	 R3238969 R3242167 R3237080 R3239493 R3238969 R3237369 R3237263 R3238548 R3238548
Matrix: WATER miscellaneous Parameters Biochemical Oxygen Demand 92.6 2.0 mg/L 31-JUL-15 Total Suspended Solids 138 DLM 6.0 mg/L 06-AUG-15 PH 8.08 0.10 PH 01-AUG-15 Sampled By: BO CHOROSZEWSKI on 30-JUL-15 @ 15:20 0.050 0.050 mg/L 05-AUG-15 Matrix: WATER WATER 0.100 mg/L 01-AUG-15 Miscellaneous Parameters Ammonia, Total (as N) <0.050	WATER neous Parameters Second State Sec	 5 R3238969 5 R3242167 5 R3237080 5 R3239493 5 R3238969 5 R3237369 5 R3237263 5 R3238548 5
Miscellaneous Parameters 92.6 2.0 mg/L 31-JUL-15 Biochemical Oxygen Demand 92.6 138 DLM 6.0 mg/L 06-AUG-15 Total Suspended Solids 138 DLM 6.0 mg/L 06-AUG-15 L1651065-2 WWTP EFFLUENT 8.08 0.10 pH 01-AUG-15 Sampled By: B0 CHOROSZEWSKI on 30-JUL-15 @ 15:20 5:20 Matrix: WATER Miscellaneous Parameters Ammonia, Total (as N) <0.050	neous Parameters 92.6 2.0 mg/L 3 pended Solids 138 DLM 6.0 mg/L 06 8.08 0.10 pH 07 WWTP EFFLUENT 8.08 0.10 pH 07 WATER 520	5 R3238969 5 R3242167 5 R3237080 5 R3239493 5 R3238969 5 R3237369 5 R3237263 5 R3238548 5
Biochemical Oxygen Demand 92.6 2.0 mg/L 31.JUL-15 Total Suspended Solids 138 DLM 6.0 mg/L 06-AUG-15 pH 8.08 0.10 pH 01-AUG-15 L1651065-2 WWTP EFFLUENT 8.08 0.10 pH 01-AUG-15 Sampled By: BO CHOROSZEWSKI on 30-JUL-15 @ 15:20 Matrix: WATER	cal Oxygen Demand 92.6 2.0 mg/L 3 pended Solids 138 DLM 6.0 mg/L 06 8.08 0.10 pH 01 WWTP EFFLUENT 8.08 0.10 pH 01 WATER Feous Parameters 5:20 0.050 mg/L 05 wATER <0.050	 5 R3238969 5 R3242167 5 R3237080 5 R3239493 5 R3238969 5 R3237369 5 R3237263 5 R3238548 5
Total Suspended Solids 138 DLM 6.0 mg/L 06-AUG-15 pH 8.08 0.10 pH 01-AUG-15 L1651065-2 WWTP EFFLUENT Sampled By: B0 CHOROSZEWSKI on 30-JUL-15 @ 5:20 Matrix: WATER 4 0.050 0.050 mg/L 05-AUG-15 Miscellaneous Parameters - 2.0 mg/L 31-JUL-15 31-JUL-15 Orthophosphate-Dissolved (as P) 0.105 DLA 0.010 mg/L 31-JUL-15 Olfform Bacteria - Fecal <1	pended Solids 138 DLM 6.0 mg/L 06 8.08 0.10 pH 01 WWTP EFFLUENT	5 R3242167 5 R3237080 5 R3239493 5 R3238969 5 R3237369 5 R3237263 5 R3238548 5
pH 8.08 0.10 pH 01-AUG-15 L1651065-2 WWTP EFFLUENT Sampled By: BO CHOROSZEWSKI on 30-JUL-15 @ 15:20 Image: Constraint of the second seco	8.08 0.10 pH 01 WWTP EFFLUENT BO CHOROSZEWSKI on 30-JUL-15 @ 15:20 Image: Constraint of the second seco	5 R3237080 5 R3239493 5 R3238969 5 R3237369 5 R3237263 5 R3238548 5
L1651065-2 WWTP EFFLUENT Sampled By: BO CHOROSZEWSKI on 30-JUL-15 @ 15:20 Matrix: WATER Miscellaneous Parameters Ammonia, Total (as N) <0.050 0.050 mg/L 05-AUG-15 Biochemical Oxygen Demand <2.0 2.0 mg/L 31-JUL-15 Orthophosphate-Dissolved (as P) 0.105 DLA 0.010 mg/L 31-JUL-15 Coliform Bacteria - Fecal <1 1 CFU/100mL 31-JUL-15 Nitrate (as N) 21.2 0.020 mg/L 31-JUL-15 Nitrate (as N) 21.2 0.050 mg/L 05-AUG-15 Nitrite (as N) <21.2 0.050 mg/L 05-AUG-15 Nitrite (as N) <0.010 0.010 mg/L 31-JUL-15 Nitrate and Nitrite (as N) <0.010 0.010 mg/L 07-AUG-15 Total Suspended Solids <3.0 3.0 mg/L 06-AUG-15 pH 8.06 0.10 pH 01-AUG-15	WWTP EFFLUENT SO CHOROSZEWSKI on 30-JUL-15 @ 15:20 Image: Constraint of the second secon	5 R3239493 5 R3238969 5 R3237369 5 R3237263 5 R3238548 5
Sampled By: BO CHOROSZEWSKI on 30-JUL-15 @ 15:20 Matrix: WATER Miscellaneous Parameters 0.050 mg/L 05-AUG-15 Biochemical Oxygen Demand <2.0	r: BO CHOROSZEWSKI on 30-JUL-15 @ 15:20 VATER	5 R3239493 5 R3238969 5 R3237369 5 R3237263 5 R3238548 5
Matrix: WATER	WATER reous Parameters 0.0050 mg/L 050 , Total (as N) <0.050	5 R3239493 5 R3238969 5 R3237369 5 R3237263 5 R3238548 5
Miscellaneous Parameters <	A, Total (as N) <0.050	5 R3239493 5 R3238969 5 R3237369 5 R3237263 5 R3238548 5
Arimitalia, Total (as N) Coust Couston Couston<	cal Oxygen Demand <2.0	 R3238493 R3238969 R3237369 R3237263 R3238548
Distribution C2.0 High Ortophosphate-Dissolved (as P) 0.105 DLA 0.010 mg/L 31-JUL-15 Coliform Bacteria - Fecal <1	call oxygen Dennand 1 2.0 1 10 1 3 sphate-Dissolved (as P) 0.105 DLA 0.010 mg/L 3 Bacteria - Fecal <1	5 R3237369 5 R3237263 5 R3238548 5
Colliform Bacteria - Fecal <1	Bacteria - Fecal <1	5 R3237309 5 R3237263 5 R3238548 5
Nitrate (as N) 21.2 0.020 mg/L 31-JUL-15 Nitrate and Nitrite (as N) 21.2 0.050 mg/L 05-AUG-15 Nitrate and Nitrite (as N) <0.010	s N) 21.2 0.020 mg/L 3 nd Nitrite (as N) 21.2 0.050 mg/L 05 s N) <0.010	5 R3238548
Nitrate (at N) 21.2 0.050 mg/L 05-AUG-15 Nitrite (as N) 20.010 0.010 mg/L 31-JUL-15 Phosphorus (P)-Total 0.149 DLA 0.010 mg/L 07-AUG-15 Total Suspended Solids <3.0	Image: Second	5
Nitrite (as N) 0.010 0.010 mg/L 31-JUL-15 Phosphorus (P)-Total 0.149 DLA 0.010 mg/L 07-AUG-15 Total Suspended Solids <3.0	Image of the second s	
Phosphorus (P)-Total 0.149 DLA 0.010 mg/L 07-AUG-15 Total Suspended Solids 3.0 3.0 mg/L 06-AUG-15 pH 8.06 0.10 pH 01-AUG-15	rus (P)-Total 0.149 DLA 0.010 mg/L 07 pended Solids <3.0	R3238548
Total Suspended Solids <3.0 3.0 mg/L 06-AUG-15 pH 8.06 0.10 pH 01-AUG-15	pended Solids <3.0 3.0 mg/L 06 8.06 0.10 pH 01	5 R3242067
рH 01-AUG-15	8.06 0.10 pH 01	5 R3242167
		5 R3237080

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
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 oxygen demand (BOD) are dissolved oxygen meter. D BOD (CBOD) is determine	using procee determined issolved BOI d by adding a	dures adapted from APHA Method 5210B - "Biod by diluting and incubating a sample for a specifie O (SOLUBLE) is determined by filtering the samp a nitrification inhibitor to the diluted sample prior	chemical Oxygen Demand (BOD)". All forms of biochemical ed time period, and measuring the oxygen depletion using a ble through a glass fibre filter prior to dilution. Carbonaceous 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 i bacteria (Fecal) and is use	using procee erated by cult ncubation at d for non-turl	dures adapted from APHA Method 9222 "Membr uring and colony counting. A known sample volu 44.5 degrees C of the filter with the appropriate of bid 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									
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry									
Ammonia is determined us sample.	ing the Phen	ate colorimetric method. Result includes both io	nized (NH4+) and un-ionized (NH3) ammonia present in the									
NO2-BC-IC-CL	Water	Nitrite in Water by IC	EPA 300.0									
This analysis is carried out detected by UV absorbanc	using proce	dures adapted from EPA Method 300.0 "Determi	nation of Inorganic Anions by Ion Chromatography". Nitrite is									
NO3-BC-IC-CL	Water	Nitrate (as N)	EPA 300.0									
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-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS									
This analysis is carried out persulphate digestion of th	using procee e sample.	dures adapted from APHA Method 4500-P "Phos	sphorus". Total Phosphorus is determined colourimetrically after									
PH-CL	Water	pH	APHA 4500 H-Electrode									
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS									
This analysis is carried out colourimetrically on a same	using procee ble that has b	dures adapted from APHA Method 4500-P "Phos been lab or field filtered through a 0.45 micron me	sphorus". 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 fi	using procee Itering 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 filter at 104 deg. C.									
** ALS test methods may inc	corporate mo	difications from specified reference methods to in	mprove performance.									
The last two letters of the a	above test co	de(s) indicate the laboratory that performed ana	lytical analysis for that test. Refer to the list below:									
Laboratory Definition Co	de Labo	ratory Location										

CL ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

Test Method References:

ALS Test Code Matrix Test Description	Method Reference**
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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.

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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 30-APR-15 Report Date: 07-MAY-15 15:51 (MT) Version: FINAL

Client Phone: 403-256-8473

Certificate of Analysis

Lab Work Order #: L1605448

Project P.O. #: Job Reference: NOT SUBMITTED FERNIE ALPINE RESORT - SPRING 2015 EMS WK 1

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1605448-1 WWTP INFLUENT							
Sampled By: BC on 29-APR-15 @ 15:00							
Matrix: WATER							
Riscenarioal Ovygon Domand	224		2.0	mall			D2105505
Total Suspended Solids	234		2.0	mg/L		30-AFR-15	R3105505
nH	7.20		9.0	nig/∟ n⊔		30 ADD 15	R3103370
	7.30		0.10	pri		30-AF K-13	K3103279
L 1605448-2 WWWIP EFFLUENI							
Sampled By. BC 011 29-APR-15 @ 15.10							
Matrix: WATER Miscellaneous Parameters							
Ammonia Total (as N)	<0.050		0.050	ma/l		04-MAY-15	R3184022
Biochemical Oxygen Demand	<2.0		2.0	mg/L		30-APR-15	R3185505
Chemical Oxygen Demand	<10		10	mg/L		06-MAY-15	R3185714
Orthophosphate-Dissolved (as P)	0 181	DLA	0.010	mg/L		01-MAY-15	R3182914
Coliform Bacteria - Fecal	<1		1	CFU/100ml		30-APR-15	R3183272
Phosphorus (P)-Total	0.221	DLA	0.025	mg/l		05-MAY-15	R3185494
Total Suspended Solids	<3.0		3.0	mg/L		04-MAY-15	R3185578
nH	7 70		0.10	ng/E		30-APR-15	R3183279
NO2, NO3 and Sum of NO2/NO3			0110	P			
Nitrate in Water by IC							
Nitrate (as N)	28.1	DLA	0.10	mg/L		01-MAY-15	R3183942
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	28.1		0.10	mg/L		04-MAY-15	
Nitrite in Water by IC	0.024		0.010				D2402042
	0.024		0.010	mg/L		30-APR-15	R3183942
L1605448-3 ELK RIVER UPSTREAM							
Sampled By: BC on 29-APR-15 @ 15:25							
Matrix: WATER							
Ammonia, Total (as N)	<0.050		0.050	ma/l		04 MAY 15	D2104022
Arthonhosphate-Dissolved (as P)	<0.050		0.050	mg/L		04-MAY-15	R3104022
Coliform Bacteria - Fecal	-0.0030	OCR	0.0050	CELI/100ml		30_APP_15	D3183272
Phosphorus (P)-Total	0.0159	OOK	0.0050	ma/l		05-MAV-15	R3185404
Total Suspended Solids	4.7		3.0	mg/L		04-MAY-15	R3185578
nH	8 36		0.10	nH		30-APR-15	R3183279
NO2. NO3 and Sum of NO2/NO3	0.00		0.10	pri		00741110	100270
Nitrate in Water by IC							
Nitrate (as N)	1.12		0.020	mg/L		30-APR-15	R3183942
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.12		0.050	mg/L		04-MAY-15	
Nitrite in Water by IC	10.010		0.040				D2402042
	<0.010		0.010	mg/L		30-APR-15	R3183942
L1605448-4 ELK RIVER @ OUTFALL							
Sampled By: BC ON 29-APR-15 @ 15:35							
Matrix: WATER							
Ammonia Total (as N)	<0.050		0.050	mc/l		∩ <i>1_</i> MAV 15	D3184000
Arthonhosnhate-Discolved (as P)			0.000	mg/L		04-WAY 15	D3182014
Coliform Bacteria - Fecal	<1		1	CEU/100ml		30-APR-15	R3183070
Phosphorus (P)-Total	0.0185		0.0050	ma/l		05-MAV-15	R3185/0/
Total Suspended Solids	7 3		3.0000 3.0	ma/l		04-MAY-15	R3185578
····			0.0				

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 29-APR-15 @ 15:35							
Matrix: WATER							
рН	8.48		0.10	pН		30-APR-15	R3183279
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	0.035		0 020	ma/l		30-APR-15	P31830/2
Nitrate+Nitrite	0.855		0.020	ing/L		50- <i>F</i> (11-15	1000042
Nitrate and Nitrite (as N)	0.935		0.050	mg/L		04-MAY-15	
Nitrite in Water by IC	10.010		0.010	100 C //			D0400040
	<0.010		0.010	mg/L		30-APR-15	R3183942
L1605448-5 ELK RIVER DOWINSTREAM							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		04-MAY-15	R3184022
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		01-MAY-15	R3182914
Coliform Bacteria - Fecal	2	OCR	1	CFU/100mL		30-APR-15	R3183272
Phosphorus (P)-Total	0.0181		0.0050	mg/L		05-MAY-15	R3185494
Total Suspended Solids	9.3		3.0	mg/L		04-MAY-15	R3185578
pH NO2_NO3 and Sum of NO2/NO3	8.49		0.10	рН		30-APR-15	R3183279
Nitrate in Water by IC							
Nitrate (as N)	1.31		0.020	mg/L		30-APR-15	R3183942
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.31		0.050	mg/L		04-MAY-15	
Nitrite (as N)	<0.010		0.010	mg/L		30-APR-15	R3183942

Sample Parameter Qualifier Key:

Qualifier	Description		
DLA	Detection Limit adjus	ted for required dilution	
OCR	Parameter is out of c	ient specific range.	
Test Method F	References:		
ALS Test Code	e Matrix	Test Description	Method Reference**
BOD-BC-CI	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day Incub -02 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	dures adapted from APHA Method 5210B - "Bid by diluting and incubating a sample for a speci D (SOLUBLE) is determined by filtering the san 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 nple through a glass fibre filter prior to dilution. Carbonaceous r to incubation.
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D-Micro Colorimetry
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 cult al 24 hour incubation at) and is used for non-tur	dures adapted from APHA Method 9222 "Memi turing 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". lume 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
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
Ammonia is det sample.	termined using the Pher	nate colorimetric method. Result includes both	ionized (NH4+) and un-ionized (NH3) ammonia present in the
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anion	s are analyzed by lon C	hromatography with conductivity and/or UV det	tection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anion	s are analyzed by lon C	hromatography with conductivity and/or UV det	tection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate dig	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
PO4-DO-COL-C	CL Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using proce y on a sample that has l	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 deter	carried out using proce mined by filtering a sam	dures adapted from APHA Method 2540 "Solid: aple 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 meth	ods may incorporate mo	odifications from specified reference methods to	improve performance.
The last two let	ters of the above test co	ode(s) indicate the laboratory that performed ar	nalytical analysis for that test. Refer to the list below:

 Laboratory Definition Code
 Laboratory Location

 CL
 ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

 Chain of Custody Numbers:
 Chain of Custody Numbers:

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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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.

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L1605448-COFC

PAGE

CHAIN OF CUSTODY FORM

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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 08-MAY-15 Report Date: 15-MAY-15 17:22 (MT) Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1609147

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: NOT SUBMITTED FARUC - SPRING 2015 EMS WEEK 2

Lyudmyla Shvets Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 07-MAY-15 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	78.9		2.0	mg/L		08-MAY-15	R3189474
Total Suspended Solids	48.0	DLA	5.0	mg/L		13-MAY-15	R3190221
рН	7.94		0.10	рН		09-MAY-15	R3188064
L1609147-2 WWTP EFFLUENT							
Sampled By: HB on 07-MAY-15 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		15-MAY-15	R3190989
Biochemical Oxygen Demand	<2.0		2.0	mg/L		08-MAY-15	R3189474
Chemical Oxygen Demand	<10		10	mg/L		13-MAY-15	R3189100
Orthophosphate-Dissolved (as P)	0.129	DLA	0.010	mg/L		08-MAY-15	R3188502
Coliform Bacteria - Fecal	1	OCR	1	CFU/100mL		08-MAY-15	R3187609
Phosphorus (P)- Lotal	0.170	DLA	0.010	mg/L		14-MAY-15	R3190311
Total Suspended Solids	<3.0		3.0	mg/L		13-MAY-15	R3190221
p⊓ NO2_NO3 and Sum of NO2/NO3	7.99		0.10	рн		09-IVIA 1-15	R3188064
Noz, Nos and Sum of Noz/Nos							
Nitrate (as N)	28.1	DLA	0.10	mg/L		08-MAY-15	R3188039
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	28.1 0.11 mg/L						
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLA	0.050	mg/L		08-MAY-15	R3188039
L1609147-3 ELKRIVER UPSTREAM							
Sampled By: HB on 07-MAY-15 @ 14:30							
Matrix: WATER							
Miscellaneous Parameters	.0.050		0.050				50400000
Ammonia, Total (as N)	<0.050		0.050	mg/L		15-MAY-15	R3190989
Caliform Bastaria - Facal	<0.0050		0.0050			08-MAY 15	R3188502
Collionni Baclena - Fecal Phosphorus (P) Total	<1		0.0050	CFU/TUUTIL		14 MAY 15	R3187609
Total Suspended Solids	0.0172		0.0050	mg/L		14-IVIA 1-15	R3190311
nH	0 45		0.10	nig/∟		13-MAT-15	R3190221
NO2. NO3 and Sum of NO2/NO3	0.45		0.10	pri		03-MAT-13	13100004
Nitrate in Water by IC							
Nitrate (as N)	1.43		0.020	mg/L		08-MAY-15	R3188039
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.43		0.050	mg/L		11-MAY-15	
Nitrite in Water by IC	~0.010		0.010	ma/l		08-MAV-15	D3188030
	<0.010		0.010	iiig/∟		00-IMAT-13	K3100039
L1609147-4 ELKRIVER OUTFALL							
Miscellaneous Parameters							
Ammonia. Total (as N)	<0.050		0.050	ma/l		15-MAY-15	R3190989
Orthophosphate-Dissolved (as P)	<0.000		0.0050	ma/l		08-MAY-15	R3188502
Coliform Bacteria - Fecal	<1		1	CFU/100ml		08-MAY-15	R3187609
Phosphorus (P)-Total	0.0153		0.0050	ma/L		14-MAY-15	R3190311
Total Suspended Solids	10.0		3.0	mg/L		13-MAY-15	R3190221
•				5			

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HB on 07-MAY-15 @ 14:45							
Matrix: WATER							
рН	8.45		0.10	pН		09-MAY-15	R3188064
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	1 30		0.020	ma/l		08-MAV-15	D3188030
Nitrate+Nitrite	1.50		0.020	ing/L		00-1017-13	K3100039
Nitrate and Nitrite (as N)	1.30		0.050	mg/L		11-MAY-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		08-MAY-15	R3188039
L1609147-5 ELKRIVER DOWNSTREAM							
Sampled By: HB on 07-MAY-15 @ 15:00							
Matrix: WATER							
Ammonia Total (as N)	<0.050		0.050	ma/l		15-MAY-15	R3190989
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		08-MAY-15	R3188502
Coliform Bacteria - Fecal	<1		1	CFU/100mL		08-MAY-15	R3187609
Phosphorus (P)-Total	0.0200		0.0050	mg/L		14-MAY-15	R3190311
Total Suspended Solids	11.3		3.0	mg/L		13-MAY-15	R3190221
рН	8.46		0.10	рН		09-MAY-15	R3188064
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	1 49		0.020	ma/l		08-MAY-15	R3188039
Nitrate+Nitrite	1.10		0.020	ing/E			10100000
Nitrate and Nitrite (as N)	1.49		0.050	mg/L		11-MAY-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		08-MAY-15	R3188039

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
OCR	Parameter is out of client specific range.

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	t using proce e determined bissolved BC ed by adding	edures adapted from APHA Method 5210B - "Bid d by diluting and incubating a sample for a speci DD (SOLUBLE) is determined by filtering the san 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 nple through a glass fibre filter prior to dilution. Carbonaceous r to incubation.
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D-Micro Colorimetry
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is carried out Coliform bacteria is enume involves an initial 24 hour i bacteria (Fecal) and is use	t using proce erated by cul incubation a ed for non-tu	edures adapted from APHA Method 9222 "Meml Ituring and colony counting. A known sample vo t 44.5 degrees C of the filter with the appropriate rbid water with a low background bacteria level.	orane Filter Technique for Members of the Coliform Group". Tume 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
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
Ammonia is determined us sample.	sing the Phe	nate colorimetric method. Result includes both	ionized (NH4+) and un-ionized (NH3) ammonia present in the
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analy	zed by lon (Chromatography with conductivity and/or UV det	ection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analy	zed by lon (Chromatography 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 carried out persulphate digestion of the	t using proce le sample.	edures adapted from APHA Method 4500-P "Pho	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	pH	APHA 4500 H-Electrode
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out colourimetrically on a same	t using proce ple that has	edures 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 carried out (TSS) are determined by fi	t using proce iltering a sar	edures adapted from APHA Method 2540 "Solids nple 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 methods may in	corporate m	odifications from specified reference methods to	improve performance.
The last two letters of the	above test c	ode(s) indicate the laboratory that performed an	alytical analysis for that test. Refer to the list below:
Laboratory Definition Co	de Labo	oratory Location	

CL ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA	
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Chain of Custody Numbers:

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**	
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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

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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:14-MAY-15Report Date:22-MAY-15 11:43 (MT)Version:FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1611776

Project P.O. #: Job Reference: NOT SUBMITTED FERNIE ALPINE RESORT - SPRING 2015 EMS WEEK 3

C of C Numbers: Legal Site Desc:

Lyudmyla Shvets Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1011/70-1 WWIP INFLUENT Sampled By: Bo Characzowski on 12 MAX 15 @ 15:10							
Matrix: WATER							
Maux. WATER Miscellaneous Parameters							
Biochemical Oxvoen Demand	57 0		20	ma/L		14-MAY-15	R3192107
Total Suspended Solids	54.7		3.0	ma/L		15-MAY-15	R3191743
рН	7.83		0.10	рН		14-MAY-15	R3190355
L1611776-2 WWTP EFFLUENT							
Sampled By: Bo Choroszewski on 13-MAY-15 @ 15:20)						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		20-MAY-15	R3193925
Biochemical Oxygen Demand	<2.0		2.0	mg/L		14-MAY-15	R3192107
Chemical Oxygen Demand	<10		10	mg/L		19-MAY-15	R3191645
Orthophosphate-Dissolved (as P)	0.105	DLA	0.010	mg/L		14-MAY-15	R3190883
Coliform Bacteria - Fecal	<1		1	CFU/100mL		14-MAY-15	R3191029
Phosphorus (P)-Total	0.139	DLA	0.010	mg/L		19-MAY-15	R3192357
Total Suspended Solids	<3.0		3.0	mg/L		15-MAY-15	R3191743
рН	7.86		0.10	рН		14-MAY-15	R3190355
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	21.5		0 020	ma/l		14-MAY-15	R3101740
Nitrate+Nitrite	21.0		0.020	iiig/E			110101740
Nitrate and Nitrite (as N)	21.5		0.050	mg/L		19-MAY-15	
Nitrite in Water by IC							
Nitrite (as N)	0.017		0.010	mg/L		14-MAY-15	R3191749
L1611776-3 ELK RIVER UPSTREAM							
Sampled By: Bo Choroszewski on 13-MAY-15 @ 15:30							
Matrix: WATER							
Miscellaneous Parameters			0.050			00 1407 45	50400005
Ammonia, Total (as N)	<0.050		0.050	mg/L		20-MAY-15	R3193925
Coliform Bostoria - Eccol	<0.0050		0.0050			14-MAY 15	R3190883
Dhosphorus (D) Total	4	OUR	0.0050	CF0/100IIIL		14-IVIA 1-15	R3191029
Total Suspended Solids	<3.0		3.0	mg/L		15-MAY-15	R3192337
nH	< <u>3.0</u> 8.40		0.10	nH		14-MAY-15	R3190355
NO2. NO3 and Sum of NO2/NO3	0.40		0.10	pri			10100000
Nitrate in Water by IC							
Nitrate (as N)	1.45		0.020	mg/L		14-MAY-15	R3191749
Nitrate+Nitrite						10 1407 15	
Nitrate and Nitrite (as N)	1.45		0.050	mg/L		19-MAY-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0 0 1 0	ma/L		14-MAY-15	R3191749
	0.0.10		0.010				
Sampled By: Bo Choroszewski on 13-MAY-15 @ 15:40)						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		20-MAY-15	R3193925
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		14-MAY-15	R3190883
Coliform Bacteria - Fecal	<1		1	CFU/100mL		14-MAY-15	R3191029
Phosphorus (P)-Total	0.0109		0.0050	mg/L		19-MAY-15	R3192357
Total Suspended Solids	<3.0		3.0	mg/L		15-MAY-15	R3191743

Sample Details/	Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
1 1611776-4								
Sampled By:	Bo Choroszewski on 13-MAY-15 @ 15:40	1						
Matrix:	WATER							
pН		8.41		0.10	рН		14-MAY-15	R3190355
NO2, NO3 and	Sum of NO2/NO3							
Nitrate in Wa	ater by IC	1.31		0.020	mg/L		14-MAY-15	R3191749
Nitrate+Nitrit	te	1 21		0.050	ma/l		10 MAY 15	
Nitrite in Wa	ter by IC	1.31		0.050	mg/L		19-10141-15	
Nitrite (as N)		<0.010		0.010	mg/L		14-MAY-15	R3191749
L1611776-5	ELK RIVER DOWNSTREAM							
Sampled By:	Bo Choroszewski on 13-MAY-15 @ 15:50	1						
Matrix:	WATER							
Ammonia. To	tal (as N)	<0.050		0.050	ma/l		20-MAY-15	R3193925
Orthophospha	ate-Dissolved (as P)	<0.0050		0.0050	ma/L		14-MAY-15	R3190883
Coliform Bact	teria - Fecal	1	OCR	1	CFU/100mL		14-MAY-15	R3191029
Phosphorus (P)-Total	0.0107		0.0050	mg/L		19-MAY-15	R3192357
Total Suspen	ded Solids	<3.0		3.0	mg/L		15-MAY-15	R3191743
рН		8.46		0.10	рН		14-MAY-15	R3190355
NO2, NO3 and	Sum of NO2/NO3							
Nitrate in Wa	ater by IC	4 5 4		0.000				D0404740
Nitrate (as N)		1.54		0.020	mg/∟		14-IVIAY-15	R3191749
Nitrate and N	itrite (as N)	1.54		0.050	mg/L		19-MAY-15	
Nitrite in Wa	ter by IC	~0.010		0.010	ma/l		14 MAY 15	P2101740
		<0.010		0.010	ilig/∟		14-IVIA 1-15	K3191749

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
OCR	Parameter is out of client specific range.

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. Di BOD (CBOD) is determined	using proce determined issolved BO d by adding	edures adapted from APHA Method 5210B - "Bio I by diluting and incubating a sample for a specif D (SOLUBLE) is determined by filtering the sam a nitrification inhibitor to the diluted sample prior	ochemical Oxygen Demand (BOD)". All forms of biochemical fied time period, and measuring the oxygen depletion using a apple through a glass fibre filter prior to dilution. Carbonaceous r to incubation.
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D-Micro Colorimetry
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 proce rated by cul ncubation at d for non-tu	dures adapted from APHA Method 9222 "Memt turing 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
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
Ammonia is determined us sample.	ing the Phei	nate colorimetric method. Result includes both i	onized (NH4+) and un-ionized (NH3) ammonia present in the
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyz	zed by lon C	Chromatography with conductivity and/or UV determined and the second s	ection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyz	zed by lon C	Chromatography 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 carried out persulphate digestion of the	using proce e sample.	dures adapted from APHA Method 4500-P "Pho	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
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 proce ble that has	edures adapted from APHA Method 4500-P "Pho been lab or field filtered through a 0.45 micron n	osphorus". Dissolved Orthophosphate is determined nembrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is carried out (TSS) are determined by fil	using proce tering a san	edures adapted from APHA Method 2540 "Solids nple through a glass fibre filter, and by drying the	s". Solids are determined gravimetrically. Total suspended solids e filter at 104 deg. C.
* ALS test methods may inc	corporate mo	odifications from specified reference methods to	improve performance.
The last two letters of the a	above test c	ode(s) indicate the laboratory that performed an	alytical 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.

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	2	WWTP inft	ient BOD		2015-05	13 5:10) Water	1	+				\uparrow			X						10.3%		
	5	WWTP Efflu	ent Routine		2015-06	13 5.4) Water		x	x	[x					12.200		
	4	WWTP Effici	Jent BOD		2015-08	-13 15:20) Water			1						X				L		122°C		
	5	WWTP Effic	ent Nutrients	antigene a	2015-0	13 15:20	Water		1251-		×	. × 1	X	X	×							112.2 °C	<u> </u>	
	G	WWTP Efflu	vent Bacteriologi	cal	2015-08	-13 15:20	Water	X		<u> </u>				1								12.2 °C	<u> </u>	
	1	Elk River Up	stream Routine	:::	2015-0	13 5 30	Water	12) -	X	X	4	-	1	्र जन्म								5.9°C	<u> </u>	
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Ő	9	Elk River Up	stream Bacterio	logical	- 2015-05	-13 /5:30) Water	· X					a		<u> </u>		L	1	: 		<u> </u> '	5.9 %	- <u>-</u>	
USE	10	Elk River @	Outfall Routine		2015-05	13 15:40	Water		X	x						<u> </u>				<u> </u>	- 	5.6°C	<u> </u>	
AB	[]	Elk River @	Outfall Nutrients	3	2015-05	13 15:40	Water	ž ž			X	X	X	X	X			ļ	<u> </u>		ļ	5.6 °(<u> </u>
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Ц.	13	Etk River Oc	wnstream Routi	กอ	2015-05	-13 15:50	Water		X	X	<u> </u>	11			<i>.</i> .	<u>.</u>		<u> </u>			<u> </u>	5.2:4	<u></u>	
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SÉN	D INVOICE TO): 	SAME AS I	REPORT	DIFFERENT FROM	REPORT (provide de	tails below)			REL	INQU	ISHE	DBY:		<u> </u>	DATE	:	2015	-05-10	1 REC	ENE	<u>) BY:</u> DAT	<u>E:</u>	
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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 22-MAY-15 Report Date: 28-MAY-15 12:25 (MT) Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1615199

Project P.O. #: Job Reference: NOT SUBMITTED FERNIE ALPINE RESORT - SPRING 2015 EMS WK 4

C of C Numbers: Legal Site Desc:

Lyudmyla Shvets Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1615199-1 WWTP INFLUENT							
Matrix: MATED							
Maurix. WATER Miscellaneous Parameters							
Biochemical Oxygen Demand	96.0		2.0	ma/L		22-MAY-15	R3196710
Total Suspended Solids	69.0		5.0	mg/L		24-MAY-15	R3195331
pH	7.96		0.10	pH		22-MAY-15	R3194690
L1615199-2 WWTP EFFLUENT							
Sampled By: BC on 21-MAY-15 @ 15:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.089		0.050	mg/L		27-MAY-15	R3196698
Biochemical Oxygen Demand	<2.0		2.0	mg/L		22-MAY-15	R3196710
Chemical Oxygen Demand	<10		10	mg/L		23-MAY-15	R3194751
Orthophosphate-Dissolved (as P)	0.190	DLA	0.010	mg/L		22-MAY-15	R3194079
Coliform Bacteria - Fecal	<1	51.4	1	CFU/100mL		22-MAY-15	R3194681
Phosphorus (P)- I otal	0.257	DLA	0.025	mg/L		26-MAY-15	R3195931
Total Suspended Solids	<3.0		3.0	mg/L		24-MAY-15	R3195331
µ⊓ NO2_NO3 and Sum of NO2/NO3	7.90		0.10	рп		22-IVIA 1-15	K3 194090
Nitrate in Water by IC							
Nitrate (as N)	23.1		0.020	mg/L		23-MAY-15	R3196806
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	23.1		0.050	mg/L		27-MAY-15	
Nitrite in Water by IC	0.024		0.010	mg/l		23 MAV 15	D2106906
	0.024		0.010	iiig/∟		23-WAT-13	K3190000
Sampled By: BC on 21-MAY-15 @ 15:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		27-MAY-15	R3196698
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		22-MAY-15	R3194079
Coliform Bacteria - Fecal	<1		1	CFU/100mL		22-MAY-15	R3194681
Phosphorus (P)-Total	0.0208		0.0050	mg/L		26-MAY-15	R3195931
Total Suspended Solids	9.3		3.0	mg/L		24-MAY-15	R3195331
рН	8.32		0.10	pН		22-MAY-15	R3194690
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	1 33		0 020	ma/l		23-MAY-15	R3196806
Nitrate+Nitrite	1.00		0.020			20 10 10	110100000
Nitrate and Nitrite (as N)	1.33		0.050	mg/L		27-MAY-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		23-MAY-15	R3196806
L1615199-4 ELK RIVER @ OUTFALL							
Sampled By: BC on 21-MAY-15 @ 15:40							
Matrix: WATER							
Ammonia Total (as N)	0 426		0.050	ma/l		27 - MAV-15	R3106609
Orthophosphate-Dissolved (as P)	<0.420		0.000	ma/l		22-MAY-15	R3194079
Coliform Bacteria - Fecal	1	OCR	1	CFU/100ml		22-MAY-15	R3194681
Phosphorus (P)-Total	0.0264		0.0050	mg/L		26-MAY-15	R3195931
Total Suspended Solids	12.0		3.0	mg/L		24-MAY-15	R3195331
				Ĩ			

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 21-MAY-15 @ 15:40							
Matrix: WATER							
рН	8.36		0.10	рН		22-MAY-15	R3194690
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	1.32		0.020	mg/L		23-MAY-15	R3196806
Nitrate+Nitrite Nitrate and Nitrite (as N)	1.32		0.050	mg/L		27-MAY-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	ma/l		23-MAY-15	R3196806
1 1615199-5 ELK RIVER DOWNSTREAM	-0.010		0.010			20 10 10	10100000
Sampled By: BC on 21-MAY-15 @ 15:50							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		27-MAY-15	R3196698
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		22-MAY-15	R3194079
Coliform Bacteria - Fecal	2	OCR	1	CFU/100mL		22-MAY-15	R3194681
Phosphorus (P)-Total	0.0325		0.0050	mg/L		26-MAY-15	R3195931
Total Suspended Solids	16.0		3.0	mg/L		24-MAY-15	R3195331
pH	8.37		0.10	рН		22-MAY-15	R3194690
NU2, NU3 and Sulli of NU2/NU3 Nitrate in Water by IC							
Nitrate (as N)	1.40		0.020	mg/L		23-MAY-15	R3196806
Nitrate+Nitrite				Ū			
Nitrate and Nitrite (as N)	1.40		0.050	mg/L		27-MAY-15	
Nitrite in Water by iC Nitrite (as N)	<0.010		0.010	mg/L		23-MAY-15	R3196806

Sample Parameter Qualifier Key:

Qualifier	Description			
DLA	Detection Limit adjus	ted for required dilution		
OCR	Parameter is out of c	lient specific range.		
Test Method R	eferences:			
ALS Test Code	Matrix	Test Description	Method Reference**	
BOD-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 (BOD) are determined n meter. Dissolved BO determined by adding	dures adapted from APHA Method 5210B - "Bio 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 nple through a glass fibre filter prior to dilution. Carbonaceous r to incubation.	
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D-Micro Colorimetry	
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D	
This analysis is Coliform bacteri involves an initia bacteria (Fecal)	carried out using proce a is enumerated by cul al 24 hour incubation at and is used for non-tur	dures adapted from APHA Method 9222 "Memb turing 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". lume 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	
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry	
Ammonia is dete sample.	ermined using the Pher	nate colorimetric method. Result includes both	ionized (NH4+) and un-ionized (NH3) ammonia present in the	
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)	
Inorganic anions	s are analyzed by lon C	hromatography with conductivity and/or UV det	tection.	
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)	
Inorganic anions	s are analyzed by lon C	hromatography with conductivity and/or UV det	tection.	
P-T-COL-CL	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 "Pho	osphorus". Total Phosphorus is determined colourimetrically after	
PH-CL	Water	рН	Iution e. on Method Reference** cygen Demand (BOD) APHA 5210 B-5 day IncubO2 electrode mm APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical cubating a sample for a specified time period, and measuring the oxygen depletion using a sample for a specified time period, and measuring the oxygen depletion using a termined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous stor to the diluted sample prior to incubation. en Demand APHA 5220 D-Micro Colorimetry Counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test of the filter with the appropriate growth medium. This method is specific for thermotolerant we background bacteria level. CALCULATION APHA 4500 NH3F-Colorimetry network and/or UV detection. CALCULATION apHA 4500 NH3F-Colorimetry APHA 4500 NH3F-Colorimetry network and/or UV detection. EPA 300.1 (mod) tith conductivity and/or UV detection. Fby C r by Clour APHA 4500 P PHOSPHORUS m APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after APHA 4500 APHA 4500 P- PhoSPHORUS m APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined litered through a 0.45 micron membrane filter. ad Solids APHA 4500 P- Gravimetric m APHA Method 2	
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 l	dures adapted from APHA Method 4500-P "Pho been lab or field filtered through a 0.45 micron n	osphorus". Dissolved Orthophosphate is determined nembrane 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 sam	dures adapted from APHA Method 2540 "Solids nple through a glass fibre filter, and by drying the	s". Solids are determined gravimetrically. Total suspended solids e filter at 104 deg. C.	
** ALS test metho	ods may incorporate mo	odifications from specified reference methods to	improve performance.	
The last two lett	ers of the above test co	ode(s) indicate the laboratory that performed an	nalytical analysis for that test. Refer to the list below:	
Laboratory Def	inition Code Labo	pratory 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.

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CHAIN OF CUSTODY FORM

COM	PANY:	FERNIE AL	PINE RESORT	UTILITIES CORPO	RATION	ATTN:	PATRICK MAJER	AN	ALY	SIS P	REQU	UEST	ED:												
	RESS:	ANY: FERNIE ALPINE RESORT UTILITIES ESS: 1505 - 17TH AVENUE SOUTH WEST CALGARY PROV. 403 - 256 - 8473 FAX: ECT NAME AND NO.: Fernie Alpine Resort- Spr ALS CC RT FORMAT: HARDCOPY HARDCOPY HARDCOPY FAX HARDCOPY FAX HARDCOPY WWTP Influent Routine WWTP Influent BOD WWTP Effluent Routine WWTP Effluent Routine WWTP Effluent BOD WWTP Effluent BoD WWTP Effluent BoD WWTP Effluent BoD Elk River Upstream Routine Elk River Upstream Routine Elk River @ Outfall Boutine Elk River Downstream Routine Elk River Downstream Bacteriological Elk River Downstream Bacteriological		JTH WEST		······	• · · · · · · · · · · · · · · · · · · ·									<u> </u>									1
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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:29-MAY-15Report Date:05-JUN-15 14:11 (MT)Version:FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1618623

Project P.O. #: Job Reference: NOT SUBMITTED FERNIE ALPINE RESORT - SPRING 2015 EMS WK 5

C of C Numbers: Legal Site Desc:

Lyudmyla Shvets Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L 1618623-1 WWIP INFLUENT							
Matrix: MATED							
Maurx. WATER Miscellaneous Parameters							
Biochemical Oxygen Demand	95.4		20	ma/l		29-MAY-15	R3200889
Total Suspended Solids	70.0	DLM	9.0	ma/l		01-JUN-15	R3199650
pH	7 71		0.10	рН		04-JUN-15	R3201776
				P			
Sampled By: BC on 28-MAY-15 @ 16:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		04-JUN-15	R3201395
Biochemical Oxygen Demand	<2.0		2.0	mg/L		29-MAY-15	R3200889
Chemical Oxygen Demand	<10		10	mg/L		04-JUN-15	R3201846
Orthophosphate-Dissolved (as P)	0.114		0.0050	mg/L		30-MAY-15	R3198418
Coliform Bacteria - Fecal	1	OCR	1	CFU/100mL		29-MAY-15	R3198930
Phosphorus (P)-Total	0.148	DLA	0.010	mg/L		02-JUN-15	R3200397
Total Suspended Solids	<3.0		3.0	mg/L		01-JUN-15	R3199650
рН	7.99		0.10	рН		30-MAY-15	R3199388
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	10.0		0.000			20 MAX 15	D2200027
Nitrate (as N)	18.0		0.020	mg/L		30-IVIA 1-15	R3200937
Nitrate+Nitrite (as N)	18.0		0.050	ma/l		03-JUN-15	
Nitrite in Water by IC			0.000				
Nitrite (as N)	0.016		0.010	mg/L		30-MAY-15	R3200937
L1618623-3 ELK RIVER UPSTREAM							
Sampled By: BC on 28-MAY-15 @ 15:40							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		04-JUN-15	R3201395
Orthophosphate-Dissolved (as P)	0.0062		0.0050	mg/L		30-MAY-15	R3198418
Coliform Bacteria - Fecal	25	OCR	1	CFU/100mL		29-MAY-15	R3198930
Phosphorus (P)-Total	0.0891		0.0050	mg/L		02-JUN-15	R3200397
Total Suspended Solids	72.0		3.0	mg/L		01-JUN-15	R3199650
pH	8.24		0.10	рН		30-MAY-15	R3199388
NO2, NO3 and Sum of NO2/NO3							
Nitrate (as N)	1.03		0.020	ma/L		30-MAY-15	R3200937
Nitrate+Nitrite				3			
Nitrate and Nitrite (as N)	1.03		0.050	mg/L		03-JUN-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		30-MAY-15	R3200937
L1618623-4 ELK RIVER @ OUTFALL							
Sampled By: BC on 28-MAY-15 @ 15:50							
Matrix: WATER							
Ammonia Total (as N)	<0.050		0.050	mc/l			D3201205
Orthonhosnhate-Dissolved (as P)	~0.050 0.0061		0.000	mg/L		30_MAV_15	D3102412
Coliform Bacteria - Fecal	24	OCR	1	CFU/100ml		29-MAY-15	R3198930
Phosphorus (P)-Total	0 0899		0.0050	ma/l		02-,IUN-15	R3200397
Total Suspended Solids	89.3		3.0	ma/L		01-JUN-15	R3199650
•				<u> </u>			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 28-MAY-15 @ 15:50							
Matrix: WATER							
рН	8.27		0.10	pН		30-MAY-15	R3199388
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	1.03		0 020	ma/l		30-MAY-15	P3200037
Nitrate+Nitrite	1.00		0.020	ing/L		00 100 10	10200007
Nitrate and Nitrite (as N)	1.03		0.050	mg/L		03-JUN-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		30-MAY-15	R3200937
L1618623-5 ELK RIVER DOWNSTEAM							
Sampled By: BC on 28-MAY-15 @ 16:00							
Matrix: WATER							
Miscellaneous Parameters	<0.050		0.050	mc/l			D2201205
Animulia, Tulai (as N) Orthonhosphate_Dissolved (as P)	<0.050 0.0050		0.050	mg/L		04-JUN-15 30_MAV 15	R3201395
Coliform Bacteria - Fecal	0.0059	OCR	0.0030	CEU/100ml		29-MAY-15	R3198930
Phosphorus (P)-Total	0.0950	CON	0.0050	ma/l		02-JUN-15	R3200397
Total Suspended Solids	96.0		3.0	ma/L		01-JUN-15	R3199650
рН	8.28		0.10	рН		30-MAY-15	R3199388
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.05		0.020	mg/L		30-MAY-15	R3200937
Nitrate+Nitrite Nitrate and Nitrite (as N)	1.05		0.050	ma/L		03-JUN-15	
Nitrite in Water by IC				0			
Nitrite (as N)	<0.010		0.010	mg/L		30-MAY-15	R3200937

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
OCR	Parameter is out of client specific range.

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 oxygen demand (BOD) are dissolved oxygen meter. D BOD (CBOD) is determine	t using proce e determined vissolved BOI ed by adding a	dures adapted from APHA Method 5210B - "Biod by diluting and incubating a sample for a specifie D (SOLUBLE) is determined by filtering the samp a nitrification inhibitor to the diluted sample prior	chemical Oxygen Demand (BOD)". All forms of biochemical ed time period, and measuring the oxygen depletion using a ole through a glass fibre filter prior to dilution. Carbonaceous to incubation.					
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D-Micro Colorimetry					
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					
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry					
Ammonia is determined using the Phenate colorimetric method. Result includes both ionized (NH4+) and un-ionized (NH3) ammonia present in the sample.								
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)					
Inorganic anions are analy	zed by lon C	hromatography with conductivity and/or UV deter	ction.					
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)					
Inorganic anions are analy	zed by lon C	hromatography with conductivity and/or UV deter	ction.					
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS					
This analysis is carried out persulphate digestion of th	t using proce e sample.	dures adapted from APHA Method 4500-P "Phos	sphorus". Total Phosphorus is determined colourimetrically after					
PH-CL	Water	рН	APHA 4500 H-Electrode					
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS					
This analysis is carried out colourimetrically on a sam	t using proce ple that has t	dures adapted from APHA Method 4500-P "Phos been lab or field filtered through a 0.45 micron me	sphorus". 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 fi	t using proce	dures 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	corporate mo	difications from specified reference methods to in	mprove 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:	

Reference Information

Test Method References:

ALS Test Code Matrix Test Description Method Reference**	ALS Test Code	Matrix	Test Description	Method Reference**
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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 ENVIRONT ARALY SIGNL CONLINGING & TES

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CHAIN OF CUSTODY FORM

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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:12-JUN-15Report Date:18-JUN-15 16:53 (MT)Version:FINAL

Client Phone: 403-256-8473

Certificate of Analysis

Lab Work Order #: L1625934

Project P.O. #: Job Reference: NOT SUBMITTED FERNIE ALPINE RESORT - SPRING 2015 EMS WK 6

C of C Numbers: Legal Site Desc:

Lyudmyla Shvets, B.Sc. Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1625934-1 WWTP INFLUENT							
Matrix MATER							
Matrix. WATER Miscellaneous Parameters							
Biochemical Oxygen Demand	196		20	ma/l		12- IUN-15	R3209438
Total Suspended Solids	213	DLM	15	mg/L		17-JUN-15	R3209937
pH	7.81		0 10	ng/L		14-JUN-15	R3207636
				P			
Sampled Bv: BC on 11-JUN-15 @ 15:45							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		15-JUN-15	R3207898
Biochemical Oxygen Demand	<2.0		2.0	mg/L		12-JUN-15	R3209438
Chemical Oxygen Demand	<10		10	mg/L		16-JUN-15	R3208640
Orthophosphate-Dissolved (as P)	0.0514		0.0050	mg/L		12-JUN-15	R3206567
Coliform Bacteria - Fecal	<1		1	CFU/100mL		12-JUN-15	R3207569
Phosphorus (P)-Total	0.0836		0.0050	mg/L		18-JUN-15	R3210327
Total Suspended Solids	<3.0		3.0	mg/L		17-JUN-15	R3209937
рН	8.03		0.10	рН		14-JUN-15	R3207636
NO2, NO3 and Sum of NO2/NO3							
Nitrate (as N)	17.0		0.020	ma/l		12 IUN 15	D2210002
Nitrate (as N)	17.9		0.020	mg/L		13-JUN-15	R3210002
Nitrate and Nitrite (as N)	17.9		0.050	ma/L		18-JUN-15	
Nitrite in Water by IC				5			
Nitrite (as N)	<0.010		0.010	mg/L		13-JUN-15	R3210002
L1625934-3 ELK RIVER UPSTREAM							
Sampled By: BC on 11-JUN-15 @ 15:35							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		15-JUN-15	R3207898
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		12-JUN-15	R3206567
Coliform Bacteria - Fecal	8	OCR	1	CFU/100mL		12-JUN-15	R3207569
Phosphorus (P)- I otal	0.0349		0.0050	mg/L		18-JUN-15	R3210327
l otal Suspended Solids	22.0		3.0	mg/∟		17-JUN-15	R3209937
µ⊓ NO2_NO3 and Sum of NO2/NO3	8.35		0.10	рп		14-JUN-15	R3207636
Nitrate (as N)							
Nitrate (as N)	1.10		0.020	mg/L		13-JUN-15	R3210002
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.10		0.050	mg/L		18-JUN-15	
Nitrite in Water by IC	-0.010		0.010	ma/l		12 IUN 15	D2210002
	<0.010		0.010	IIIg/L		13-3010-15	R3210002
L1625934-4 ELK RIVER @ OUFALL							
Miscellaneous Parameters							
Ammonia. Total (as N)	<0.050		0.050	ma/l		15-JUN-15	R3207898
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	ma/L		12-JUN-15	R3206567
Coliform Bacteria - Fecal	16	OCR	1	CFU/100mL		12-JUN-15	R3207569
Phosphorus (P)-Total	0.0375		0.0050	mg/L		18-JUN-15	R3210327
Total Suspended Solids	24.7		3.0	mg/L		17-JUN-15	R3209937

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled Bv: BC on 11-JUN-15 @ 15:30							
Matrix: WATER							
pН	8.39		0.10	рН		14-JUN-15	R3207636
NO2, NO3 and Sum of NO2/NO3							
Nitrate (as N)	1 1 1		0.020	ma/l		13_ II INI_15	P3210002
Nitrate+Nitrite	1.11		0.020	iiig/L		10-0010-10	K3210002
Nitrate and Nitrite (as N)	1.11		0.050	mg/L		18-JUN-15	
Nitrite in Water by IC							
	<0.010		0.010	mg/L		13-JUN-15	R3210002
L1625934-5 ELK RIVER DOWNSTREAM							
Sampled By. BC ON TH-JON-15 @ 15.25							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		15-JUN-15	R3207898
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		12-JUN-15	R3206567
Coliform Bacteria - Fecal	4	OCR	1	CFU/100mL		12-JUN-15	R3207569
Phosphorus (P)-Total	0.0395		0.0050	mg/L		18-JUN-15	R3210327
Total Suspended Solids	20.7		3.0	mg/L		17-JUN-15	R3209937
pH NO2_NO3 and Sum of NO2/NO3	8.40		0.10	рН		14-JUN-15	R3207636
Noz, Nos and Sun of Noz/Nos							
Nitrate (as N)	1.14		0.020	mg/L		13-JUN-15	R3210002
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.14		0.050	mg/L		18-JUN-15	
Nitrite (as N)	<0.010		0.010	mg/L		13-JUN-15	R3210002

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description							
DLM	Detection Limit Adjus	ted due to sample matrix effects.						
OCR	Parameter is out of c	lient specific range.						
Test Method R	fest 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 o oxygen demand dissolved oxyger BOD (CBOD) is	carried out using proce (BOD) are determined n meter. Dissolved BO 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 san 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 nple through a glass fibre filter prior to dilution. Carbonaceous r to incubation.					
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D-Micro Colorimetry					
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-tur	dures adapted from APHA Method 9222 "Memi turing 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". lume 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					
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry					
Ammonia is dete sample.	ermined using the Pher	nate colorimetric method. Result includes both	ionized (NH4+) and un-ionized (NH3) ammonia present in the					
NO2-BC-IC-CL	Water	Nitrite in Water by IC	EPA 300.0					
This analysis is o detected by UV a	carried out using proce absorbance.	dures adapted from EPA Method 300.0 "Deterr	nination of Inorganic Anions by Ion Chromatography". Nitrite is					
NO3-BC-IC-CL	Water	Nitrate (as N)	EPA 300.0					
This analysis is o detected by UV a	carried out using proce absorbance.	dures adapted from EPA Method 300.0 "Deterr	nination of Inorganic Anions by Ion Chromatography". Nitrate is					
P-T-COL-CL	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 "Photos	osphorus". Total Phosphorus is determined colourimetrically after					
PH-CL	Water	рH	APHA 4500 H-Electrode					
PO4-DO-COL-CI	L Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS					
This analysis is c colourimetrically	carried out using proce on a sample that has l	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 o (TSS) are detern	carried out using proce nined by filtering a san	dures adapted from APHA Method 2540 "Solids nple 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 lette	ers of the above test co	ode(s) indicate the laboratory that performed ar	nalytical analysis for that test. Refer to the list below:					

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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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.

AL S Environmental

SEND REPORT TO:



www.alsenviro.com

Version (L.C. 1997) I Store View 1 Tel: 604-2014 - 3 Tel: Free Court Control Free 604-255-6700



L1625934-COFC

CHAIN OF CUSTODY FORM

Fort \$1, John BC, Box 256, 9831 - 98A Avie une M13 6W7, Tel. 250-261 5517, Hay

Grand Posicie AB (99.95) 111 Streig TOY (1991) Tel: 7P0 539 5106 Toll From 1.99

For: Memorray AB, 1993, 245 Macdoniae Gr, 1981 455, Tel: 780 791-1524, Fax, 7 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 5K, 819 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-E

сом	MPANY: SERNIE ALPINE RESORT UTILITIES CORPORATION		RATION	<u>A1TN:</u>	PATRICK MAJER	AN	ALYS	SIS F	EQU	EST	ED:								-						
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CITY	;	CALGARY		PROV: ALBER	ТА	POSTAL CODE:	T2T 0E2					ĺ													
TEL:		403 - 256 - 8	3473	FAX: 403 - 24	44 - 3774	SAMPLER:	Bo Choroszewski																		
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PO N	IO.:		·	ALS CONTACT:	Lyudmyta Shvet:	s																			
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		WWTP Influ	iont BOD	2	2015-06-11	15:50	Water		Ī							х						138	°C		
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SPE	CIAL INSTRU	JCTIONS.	PLFASE FAX	(A COPY OF THE P	RESULTS TO 250	0-423-4652 OR I	E-MAIL TO		-	FOI		3 US	EON	ILY					~		Γ			_	-
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GODUAL TY/00, DOCUMENTS TO AUTHORIZED/FORMS/CoC for ALS EM5 xbs



ATTN: Patrick Majer Fernie Alpine Resort Utilities Corp. 1505-17 Ave. SW Calgary, Alberta Canada T2T 0E2 Received: Report Date: Version: 2015/01/08, 1355 2015/01/19 FINAL

HydroQual Test Report

Client: Reference: Billing: FER116 15-0029 See paperwork

echnical Lead

Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or in part is assumed for the collection, handling or transport of the sample, application or interpretation of the test data or results.



			Result Su	mmary		Client: FER116 Reference: 15-0029-01-T	RD
Client:	Fernie Alpine	Resort Util	ities Corp.; ope	eration Fernie	Alpine Resor	t Contents	
Sample: Collection: Receipt: Containers: Description: Test:	Wastewater collected on 2 received on 2 received 2 x 2 seals and no type: water, o started on 20	2015/01/07 015/01/08 a 20 L pails a initials collection m 015/01/09 ;	at 1630 by Hur at 1355 by AH t 6 °C, in good nethod: grab ended on 2015	ngry condition with v/01/13	า ทอ	Result Summary2 Test Conditions2 Test Data Comments/Statistics5 QA/QC	1
Result:	Endpoint (96-hour)	Value (%)	Confidence L lower	imits (95%) upper		Method Calculated	
Acute: (mortality)	LC50 LC25	>100 >100				could not be calculated could not be calculated	
Mortality (%)	Notes: LC25 & L	C50, concentr	6.3	% and 50% of th 13 Concentratio	25 n (%)	50 100	

The test data and results are authorized and verified correct.

Technical Leag

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HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1 Tel (403) 253-7121 fax (403) 252-9363 <u>www.hydroqual.ca</u>



Test Conditions

Client: FER116 Reference: 15-0029-01-TRD

Method:	Biological Test Method: Reference Method for Determining Acute Lethality of
	Effluents to Rainbow Trout, 2000, Environment Canada, EPS 1/RM/13.
	Second Edition (amended May 2007)
Test type:	Trout 96-h Static Acute Test (WTR-ME-041)
Species:	Oncorhynchus mykiss
Organism source:	Sam Livingston Fish Hatchery (Batch 20141203TR)
Acclimation:	36 days (must be >2 weeks)
Stock mostality	0.13% (must be $\simeq 2$ weeks)
Stock mortanty.	0.13% (seven days preceding testing)
Sample initial chemistry:	pH = 6.0; EC: 086 (US/cm @ 25°C); DO: 0.4 (ma/L); temperature: 11 °C
Sample initial chemistry.	bardness (mg CoCO2/L): 107: colour: vollow: odour: odourless
Comula haldina timoo	Defense (mig CaCU3/L). 197, COlour. yellow, Odour. Odourless
Sample noiding time:	$2 \text{ days} (\text{must be} \leq 5 \text{ days})$
Sample storage:	4 ± 2°C in darkness
Tost voscol	The test was conducted in 22 L plastic pails with polyethylene liners
Test vessel.	20 Litree (donth of solution in oach tost vossol >15cm)
Test volume:	20 Littles (depth of solution in each test vessel 215cm)
Sample pre-treatment:	All test solutions and controls were pre-aerated for 120 minutes at 0.5 ±1 mL/min/L
	Dissolved oxygen in 100 % sample was 9.3 mg/L after pre-aeration
	The sample was not filtered or pH adjusted prior to or during testing
Loading density:	0.379 g/Litre (must be \leq 0.5 g/Litre)
Control/dilution water:	Dechlorinated City of Calgary water acclimated to test conditions
Test concentrations:	5 effluent concentrations (6.3, 12.5, 25, 50, 100% (v/v) plus a negative control)
Test replicates:	One replicate per treatment; 10 fish per replicate
Feeding:	Fish are not fed 24 hours before test initiation and no feeding during test
Measurements:	pH, conductivity, dissolved oxygen and temperature measured daily
Aeration:	All treatments aerated at 6.5 ±1 mL/min/L by oil-free compressed air
	passed through airline tubes connected to disposable air stones
Lighting:	Overhead full spectrum fluorescent lights: 100-500 lux at surface
Photoperiod:	16h light 8h dark
Test temperature:	15 + 1°C
rest temperature.	
Endpoint:	Mortality, 96-h LC50 (with 95% confidence limits)
Test validity:	The control had 100% survival (must ≥ 90%)
	The control had 0 percent (%) stressed behaviour (must $\leq 10\%$)
Reference toxicant	96-h test with Phenol (C_0H_0) initiated December 26, 2014; current results
itererence toxicalit.	$(96-b \mid C50 \text{ and } 95\% \text{ confidence limits}) = 0.91 (0.86 - 0.96) \log (mg/l. Phenol)$
	$(30^{-1} \pm 0.00)$ and 30.70 confidence inflices = 0.31 (0.00 - 0.00) log (fig/ \pm 1 field)

Note: Outlined sections are protocol deviations explained on the comment page; v/v, volume per volume

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Test Data

Client: FER116 Reference: 15-0029-01-TRD

Test Log:								
D	ate	Day	Time		Technician			
2015	5/01/09	0	1115		MGC			
2015	5/01/10	1	0815		PL/CQ			
2015	5/01/11	2	0935		ML/NM			
2015	5/01/12	3	1000		СВ			
2015	5/01/13	4	0845		CQ/JR	1		
Chemistry	<i>r</i> :							
Conc. (%)	control	6.3	13	25	50	100		
Davi				att funtion				
Day	70	77	77		7.9	76	1	
1	7.0	1.1	7.7	7.0	7.0	7.0		
2	0.0	8.0	7.9	8.0	7.9	7.8		
2	0.1	0.0	0.0	8.0	7.9	7.8	-	
3	0.0	0.0	0.0	7.0	7.9	7.0		
4	1.9	1.9	1.9	7.9	1.5	1.1		
			Conduct	ivity (µS/cm	@ 25°C)			
0	497	528	561	621	748	982		
1	483	526	562	618	743	968		
2	499	531	563	623	751	980		
3	497	529	571	630	750	987		
4	505	531	571	628	756	986		
			Dissol	ved Oxygen	(mg/L)			
0	8.4	8.8	8.9	9.0	9.1	9.3		
1	8.5	8.5	8.6	8.6	8.6	8.5		
2	7.7	7.7	7.8	7.8	7.8	7.7		
3	8.6	8.7	8.8	8.8	8.8	8.8		
4	8.2	8.5	8.7	8.7	8.7	8.6		
			Те	mperature (°C)	T		
0	16	15	15	15	14	14		
1	15	15	15	15	15	15		
2	16	15	15	15	15	15	· · · · · · · · · · · · · · · · · · ·	
3	15	15	15	15	15	15		
4	16	15	15	15	15	15		

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Test Data

Client: FER116 Reference: 15-0029-01-TRD

Conc. (%)	control	6.3	13	25	50	100	
Day							
οΓ	10	10	10	10	10	10	
1	10	10	10	10	10	10	
2	10	10	10	10	10	10	
3	10	10	10	10	10	10	
4	10	10	10	10	10	10	
				Mortality (%)			
4	0	0	0	0	0	0	
				Stressed (%))		
4 F	0	0	0	0	0	0	

Biology Summary Tables:

Control	Length	Wet
Fish	(cm)	Weight(g)
1	3.1	0.4
2	3.8	0.8
3	3.1	0.3
4	3.7	0.7
5	4.3	1.1
6	4.1	0.9
7	4.0	0.9
8	3.7	0.7
9	3.4	0.5
10	4.6	1.3
average [3.8	1 0.8
ed	0.5	0.0

Cana (9/)	Group Wet
CONC. (%)	Weight (g)
control	7.6
6.3	6.9
13	7.4
25	5.5
50	7.0
100	7.3

Notes: nd, not done; na, not applicable; sd, standard deviation; cv(%), coefficient of variation

13.0

42.4

Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or In part is assumed for the collection, handling or transport of the sample, application or interpretation of the test data or results.

cv(%)



Comments/Statistics

Client: FER116 Reference: 15-0029-01-TRD

Test Result Comments: None

.

Data Analysis: Endpoints for mortality could not be calculated. No effect occurred.

Protocol Deviations: None

> Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or in part is assumed for the collection, handling or transport of the sample, application or interpretation of the test data or results.



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Comments: None

2

Warning Chart Trout

T	est Method: Reference:	Trout 96h Sta HydroQual Te Biological Tes Effluents to R including May	tic Acute Tes est Method: V at Method: Re ainbow Trou 1996 апd D	st. (LC50, 5 treat WTR-ME-042 eference Methoc t, 1990. Environi ecember 2000 a	tments plus a I for Determin ment Canada, mendments.	control) ing Acute Lethality EPS 1/RM/13.	of
Tes cu temp disso stock morta ba	t Organism: test species lture source erature (°C) lved oxygen ality (last 7d) atch number	: <i>Oncorhyncus</i> : Sam Livingsto : 15 ± 1 : 70-100% satu : 0.12% : 20141203TR	<i>mykiss</i> on Fish Hatc uration	rol. of te vol. of te replicates p fish load temp light level (w control/c	Test Design: st vessel (L): olume depth: er treatment: per replicate: ing (g fish/L): berature (°C): photoperiod: ater surface): tilution water:	20 >15 cm 1 10 ≤0.5 15 <u>+</u> 1 16h light: 8h dark 100-500 lux (full-sp dechlorinated tap)	pectrum) water
-			Cur	rent Test			
Result (l	toxican started or _C50 @ 96h Limits (95%	t phenol (C ₆ H ₅ n 2014/12/26) 0.91) lower	OH) ended on log (mg phe 0.86 Histo	2014/12/30 enol/L); geometri upper rical Values	c mean 0.96	10.1	
warning control	mear limits (±2 sd limits (±3 sd	n 0.97 lower) 0.81) 0.73	sd upper 1.13 1.21	0.08 (95% confide (99% confide	cv(%): nce limits) nce limits)	12.1	
notes: sd, star	ndard deviation	n; cv, coefficient o	of variance				
	• Test F	Result -	🕳 🗕 Mean	 Warni	ng (95%)	——— Control (99%))
	1.20 -		33	თ		1. Calman	
LC50@96 h (log(mg phenol/L))	1.00 0.80	2014/04/06 2014/04/15 2014/04/28	2014/06/06 2014/06/06	2014/07/1 2014/08/04 2014/08/25 2014/09/08	2014/10/07 2014/10/28 2014/10/27	2014/12/4	

Our liability is limited to the cost of the test requested on the sample as received. No liability in whole or in part is assumed for the collection, handling or transport of the sample, application or interpretation of the test data or results in part or in whole.

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Sample

8

The test data and results are authorized and verified correct.

echnical Lead

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These terms and conditions are incorporated into and form part of the Chain of Custody between HydroQual Laboratories Ltd. ("HydroQual") and the party named in the Chain of Custody (the "Client").

- Definitions: Capitalized terms shall have the definition ascribed as such in these General Terms and Conditions and the Chain of Custody, ÷
 - The Services: HydroQual will provide the Services to the Client as listed and described in the Chain of Custody. <u>പ്</u>.
- changes in legislative requirements, Client variations of sample numbers and Client requests for changes to standard reporting requirements, Notwithstanding condition 3, all quotations are reviewed and updated on a Prices: HydroQual may review and change all prices, fees, surcharges or other charges as set out in proposals and/or price quotations if there are changes to HydroQual's cost beyond HydroQual's control, including yearly basis
 - Payment Terms: The Client shall pay HydroQual within 30 days of the invoice date as provided by HydroQual. HydroQual may, for reasonable business reasons, require the Client to arrange for payment in advance, Quotation Numbers: The Client shall provide the proposal and/or price quotation number to HydroQual (where applicable) to ensure correct pricing. 4. 13
 - Taxes: Applicable taxes are not included in prices, surcharges and additional fees and will be added at the time of invoicing. ų.
- No Guarantee of Results: The Client is responsible for informing itself on the limitation of the results and acknowledges that the results are not guaranteed.
- Standard of Care: HydroQual will use reasonable care and diligence as required by the laws of the province or territory where the sample is tested, subject to that level of care and skill ordinarily exercised by other laboratories currently practicing under similar conditions in the same locality, subject to the time limits and financial, physical or other constraints applicable to the Services. No warranty, express or implied, is made, ŵ
 - Storage: Where possible, HydroQual will store samples until a final report is issued to the Client, after which time HydroQual may discard the sample, 9. 19. je
- Archives: If the Client requests a sample be archived, HydroQual will store the sample for a mutually agreed upon written time frame and price, after which HydroQual will invoice the Client and discard the sample, Holds: If the Client requests a sample be placed on hold, HydroQual will store the sample for the mutually agreed upon written time and price, after which HydroQual will invoice the Client and discard the sample. 1.
- Handling Protocol: Legal sample handling protocol must be arranged, and provided in writing, before samples are collected. HydroQual will provide a price quotation for legal sample protocol. Samples processed under legal protocol are stored indefinitely, subject to a storage charge as advised by HydroQual. 5
 - Samples: The quality, condition, content and source of samples stored and tested are not known to HydroQual except as declared and described on the Chain of Custody completed and submitted by the Client and accompanying the sample. 13.
- Client acknowledges that during the performance of the Services samples may be altered, lost, damaged or destroyed and the client forever releases HydroQual from any and all claims the Client may have for any loss or Risk of Loss: HydroQual will use reasonable care to protect samples during storage, however, all samples are stored at the Client's risk and the Client is responsible for obtaining appropriate insurance, if desired. The damage to the sample. 14,
- Environmental: the Client must comply with all applicable environmental legislation, including labeling all hazardous samples to comply with Canada's Workplace Hazardous Materials Information System and the Alberta Transfer of Dangerous Goods regulations, and must provide appropriate material safety data sheets that include the nature of the hazard and a contact name and phone number to call for information. The Client shall defend, indemnify and hold harmless HydroQual for all loss or damages, including any fine or cost of complying with an order of any government authority, resulting from the Client's breach of this paragraph. 5.
 - Hazardous Materials Disposal: HydroQual may return, at the Client's cost, hazardous material to the Client for disposal, ġ
- Hazardous Materials Surcharge: HydroQual may apply an additional surcharge for handling of hazardous samples or samples with Naturally Occurring Radioactive Materials ("NORM"), such as and including without limitation, H₂S and CN. 17.
- Sample Containers: HydroQual may ship sample containers to the Client's location by the most cost effective means using HydroQual's preferred courier suppliers, within the specified project timeline. Shipping will be charged back to the Client. 18.
 - Additional Charges: HydroQual may charge the Client: 19.
- (a) for pick-up and delivery services when provided subject in each instance to a minimum charge of \$50.00; and,
 (b) for rush service (processing samples and/or reporting).

 - Large Bottle Orders: The Client shall provide HydroQual with not less than 24 hours' notice for large bottle orders.
- Re-Tests: HydroQual reserves the right to re-test any samples that remain in HydroQual's possession. Re-tests requested by the Client may be charged to Client and Client agrees to pay for such charges. 21.
- Waiver: The Client is responsible for making any assessment regarding the suitability of the Services and the intended results for the Client's purposes and waives any and all claims against HydroQual that the Client may have against HydroQual as a result of the interpretation of the results provided to the Client. The Client shall defend, indemnify and save harmless HydroQual for any and all claims made by any third party against HydroQual in respect of all losses however arising from the performance of the Services or the use of any report provided in the performance of the Services.
- FORESEEABLE OR UNFORESEEABLE (INCLUDING CLAIMS FOR LOSS OF PROFITS OR REVENUE OR LOSSES CAUSED BY STOPPAGE OF OTHER WORK OR IMPAIRMENT OF OTHER ASSETS) INCURRED BY THE CLIENT ARISING OUT OF BREACH OR FAILURE OF EXPRESS OF IMPLIED WARRANTY, BREACH OF CONTRACT, BREACH OF WARRANTY, MISREPRESENTATION, NEGLIGENCE, STRICT LIABILITY UNDER WHICH THE SAMPLE WAS ORIGINALLY DEPOSITED, FOR THE PURPOSES OF THIS PARAGRAPH AND PARAGRAPHS 7, 14, 15, 22, AND 24, AS APPLICABLE, "HYDROQUAL" INCLUDES WITHOUT IN TORT OR OTHERWISE. IN ANY EVENT, THE LIABILITY OF HYDROQUAL TO THE CLIENT SHALL BE LIMITED TO THE COST OF TESTING THE SAMPLE AS REQUESTED IN THE CHAIN OF CUSTODY LIMITATIONS ITS DIRECTORS, OFFICERS, EMPLOYEES AND AFFILIATES AND THE "CLIENT" INCLUDES WITHOUT LIMITATION ANY THIRD PARTY THAT MAY HAVE A CLAIM AGAINST HYDROQUAL LIMITATION OF LIABILITY: IN NO EVENT SHALL HYDROQUAL BE RESPONSIBLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY OR PUNITIVE DAMAGES, WHETHER THROUGH THE CLIENT, 23.
 - Notice of Liability: Notwithstanding paragraph 23, HydroQual shall not be liable to the Client unless the Client provides notice in writing to HydroQual of such loss or damage, together with full particulars thereof, within 30 days of the Client's receipt of the report of the analysis of the sample giving rise to such liability. The provisions of this paragraph allocate the risk between the Client and HydroQual, and the fees to be paid by the Client to HydroQual reflect this allocation of any such risks and the limitations of liability in these General Terms and Conditions. 24.
 - conditions contained in any documentation provided by the Client. HydroQual's execution of any subsequent documentation from the Client only acknowledges receipt and not acceptance of any terms or conditions therein Entire Agreement: These General Terms and Conditions, the Chain of Custody and price quotations constitute the entire agreement between the parties and supersede and take precedence over any terms and unless expressly stipulated otherwise by HydroQual. If there is a conflict between these General Terms and Conditions and any other document, these General Terms and Conditions prevail. 25.



ATTN: Patrick Majer Fernie Alpine Resort Utilities Corp. 1505-17 Ave. SW Calgary, Alberta Canada T2T 0E2 Received: Report Date: Version: 2015/05/29 2015/06/15 FINAL

HydroQual Test Report

Client:	FER116
Reference:	15-0598
Billing:	FER116

achapp

Senior Verifier

Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or in part is assumed for the collection, handling or transport of the sample, application or interpretation of the test data or results.

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Transmittal

Date: 2015/06/15

From: Jacklyn Poole B. Sc. Laboratory Supervisor

To: Patrick Majer Fernie Alpine Resort

Sublet of Rainbow Trout Testing for 15-0598

A toxicity sample was collected May 28, 2015 and given the name Wastewater. This sample was then submitted to HydroQual Laboratories for analysis and was assigned the laboratory reference 15-0598. The required tests included rainbow trout.

Due to the mortality of HydroQual's in-house rainbow trout culture not meeting Environment Canada requirements, the rainbow trout component was subcontracted to an alternate CALA-Accredited laboratory, *AquaTox Testing and Consulting Inc.*

Detailed results from AquaTox have been provided here for your consideration. The photoperiod requirement of 16 +/-1 h light was not met due to a power failure and was noted as a deviation on the report. I have verified that these results met all other necessary method requirements.

Please let me know if you have any questions or if you require any additional information.

Laboratory Supervisor

The document(s) included in this transmission are intended only for the recipient(s) named above and contain privileged and confidential information. Any unauthorized disclosure, dissemination or copying of this transmission is strictly prohibited. If you have received this transmission in error, please immediately notify us by telephone and destroy the transmission. Thank you.



AquaTox Testing & Consulting Inc. 11B Nicholas Beaver Rd. **RR 3** Guelph ON N1H 6H9 Tel: (519) 763-4412 Fax: (519) 763-4419

Work Order : 228453 Sample Number : 44165

SAMPLE IDENTIFICATION

Company :	Hydroqual Laboratories Ltd.	Time Collected :	Not provided
Location :	Calgary AB	Date Collected :	2015-05-28
Substance :	15-0598	Date Received :	2015-06-02
Sampling Method :	Not provided	Date Tested :	2015-06-02
Sampled By :	Not provided	Temp. on arrival :	17.0 °C
Sample Description :	Clear, light yellow, odourless		
Test Method :	Reference Method for Determining Acute Lethali	ity of Liquid Effluents to R	ainbow Trout.

Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 amendments).

Effect	Value	95% Confidence Limits	Slope	Calculation Method
96-h LC50	>100%		-	-
		The results reported relate only to the s	sample tested.	

POTASSIUM CHLORIDE REFERENCE TOXICANT DATA

Organism Batch : Date Tested (yyyy-mm-dd) : LC50 (95% Confidence Limits) : Statistical Method :	T15-08 2015-06-02 3277 mg/L (2932 - 3675) Linear Regression (MLE)	Historical Mean LC50 : Warning Limits (± 2SD) : Analyst(s) :	3776 mg/L 3172 - 4494 mg/L SS, FS, TL
· · · · · · · · · · · · · · · · · · ·	TEST F	FISH	an ann an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha

Control Fish Sample Size : Mean Fish Weight (± 2 SD): Range of Weights : Fish Loading Rate :

10 0.34 ± 0.08 g 0.27 - 0.39 g 0.2 g/L

Range of Fork Lengths :

0.1 % (prev. 7 days) Cumulative stock tank mortality : Mean Fish Fork Length (± 2 SD): 35.1 ± 2.9 mm 33 - 37 mm

TEST CONDITIONS

Test Organism :	Oncorhynchus mykiss	Volume Tested (L) :	16
Sample Treatment :	None	Number of Replicates :	1
pH Adjustment :	None	Organisms Per Replicate :	10
Test Aeration :	Yes	Total Organisms Per Test Level :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Test Method Deviation(s):	Yes (see below)

Noted Deviation(s): Due to a power failure on 2015-06-03, the photoperiod requirement of 16±1 h light was not satisfied for this test. Test lighting was reduced by approximately 1 hour and 45 minutes. Since all test validity criteria were satisfied, it is unlikely that this deviation had a significant impact on the outcome of the test, and the test is considered to be valid.

Date: 2015 - 06 - 11 yyyy-mm-dd

Approved by: <u>Shan</u> Project Manage



TOXICITY TEST REPORT

Rainbow Trout

Page 2 of 2

Work Order: Sample Number:	228453 44165						
Total Pre-Aeration			pH	D.O. (mg/L)	Cond. (µmhos/cm)	Temp. (°C)	O_2 Sat. (%) [*]
Time (h)	Initial W	ater Chemistry:	7.7	8.3	691	15.0	_
0:30	Chemistry	y after 30min air:	7.7	8.4	693	15.0	90
			0 hours				· · · · · · · · · · · · · · · · · · ·
Date & Time	2015-06-02	14:55					
Test Conc. (%)	SS(FS) Mortality	Immobility	nH	DO	Cond	Temn	0 , Sat $(\%)^*$
100	0	0	7.7	8.4	693	15.0	90
50	0	0	7.9	8.9	765	15.0	
25	0	0	8.3	9.3	794	15.0	
12.5	0	0	8.3	9.5	817	15.0	
6.25	0	0	8.4	9.5	825	15.0	
Control	0	0	8.4	9.6	808	15.0	100
Notes:							
			24 hours				
Date & Time	2015-06-03	14:55					
Technician:	SS(FS)				~ .		
1 est Conc. (%)	Mortality	Immobility	рН	D.O.	Cond.	Temp.	
50	0	0		—	_	15.0	
25	0	0				15.0	
12.5	0	0	_	—	—	15.0	
6.25	0	0	_	_	_	15.0	
Control	0	0	_	_		15.0	
Notes:	0	U				15.0	
			49 h				
Date & Time	2015-06-04	14:55	40 110015				
Technician:	FS	1 1100					
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	
100	0	0	-	_	_	15.0	
50	0	0	_	_		15.0	
25	0	0		-	****	15.0	
12.5	0	0				15.0	
6.25	0	0	-	_	_	15.0	
Control	0	0		~		15.0	
Notes:							
			72 hours				
Date & Time	2015-06-05	14:55					
Technician:	FS			D 0	~ .	-	
Test Conc. (%)	Mortality	Immobility	рН	D.O.	Cond.	Temp.	
100	0	0	-		_	15.0	
25	U	0	—	_	_	15.0	
12.5	0	0	_		_	15.0	
6.25	0	0	_		—	15.0	
Control	0	0	_	_	_	15.0	
Notes:	0	0				15.0	
			06 hours				<u></u>
Date & Time	2015-06-06	14:55	70 110ul 8				
Technician:	TL	1100					
Test Conc. (%)	Mortality	Immobility	pН	D.O.	Cond.	Temp.	
100	0	0	8.0	9.6	697	15.0	
50	0	0	8.4	9.8	762	15.0	
25	0	0	8.4	9.7	793	15.0	
12.5	0	0	8.3	9.7	811	15.0	
6.25	0	0	8.3	9.6	791	15.0	
Control	0	0	8.3	9.6	742	15.0	
Notes:							
# of control organisms	showing stres	s: 0					
Trout Batch #:	T15-08	0					

Number immobile does not include number of mortalities.

* adjusted for actual temp. & barometric pressure

"-" = not measured

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- 13. Samples: The quality, condition, content and source of samples stored and tested are not known to HydroQual except as declared and described on the Chain of Custody completed and submitted by the Client and accompanying the sample.
- 14. Risk of Loss: HydroQual will use reasonable care to protect samples during storage, however, all samples are stored at the Client's risk and the Client is responsible for obtaining appropriate insurance, if desired. The Client acknowledges that during the performance of the Services samples may be altered, lost, damaged or destroyed and the client forever releases HydroQual from any and all claims the Client may have for any loss or damage to the sample.
- 15. Environmental: the Client must comply with all applicable environmental legislation, including labeling all hazardous samples to comply with Canada's *Workplace Hazardous Materials Information System* and the Alberta *Transfer of Dangerous Goods* regulations, and must provide appropriate material safety data sheets that include the nature of the hazard and a contact name and phone number to call for information. The Client shall defend, indemnify and hold harmless HydroQual for all loss or damages, including any fine or cost of complying with an order of any government authority, resulting from the Client's breach of this paragraph.
- 16. Hazardous Materials Disposal: HydroQual may return, at the Client's cost, hazardous material to the Client for disposal.
- 17. Hazardous Materials Surcharge: HydroQual may apply an additional surcharge for handling of hazardous samples or samples with Naturally Occurring Radioactive Materials ("NORM"), such as and including without limitation, H₂S and CN.
- 18. Sample Containers: HydroQual may ship sample containers to the Client's location by the most cost effective means using HydroQual's preferred courier suppliers, within the specified project timeline. Shipping will be charged back to the Client.
- 19. Additional Charges: HydroQual may charge the Client:

(a) for pick-up and delivery services when provided subject in each instance to a minimum charge of \$50.00; and,

(b) for rush service (processing samples and/or reporting).

- 20. Large Bottle Orders: The Client shall provide HydroQual with not less than 24 hours' notice for large bottle orders.
- 21. Re-Tests: HydroQual reserves the right to re-test any samples that remain in HydroQual's possession. Re-tests requested by the Client may be charged to Client and Client agrees to pay for such charges.
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ATTN: Patrick Majer Fernie Alpine Resort Utilities Corp. 1505-17 Ave. SW Calgary, Alberta Canada T2T 0E2 Received: Report Date: Version: 2015/11/06 2015/11/23 FINAL

HydroQual Test Report

Client:	FER116
Reference:	15-1545
Billing:	FER 116

and

Senior Verifier

Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or in part is assumed for the collection, handling or transport of the sample, application or interpretation of the test data or results.

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1 Tel (403) 253-7121 fax (403) 252-9363 <u>www.hydroqual.ca</u>



Result Summary

Client: FER116 Reference: 15-1545-01-TRD

Client: Fernie Alpine Resort Utilities Corp.; operation Fernie Alpine Resort

Sample: WASTEWATER

Collection: collected on 2015/11/05 at 1630 by BO
 Receipt: received on 2015/11/06 at 1030 by MC
 Containers: received 2 x 20 L pail at 13 °C, in good condition with seals and no initials
 Description: type: water, collection method: grab

Test: started on 2015/11/10 ; ended on 2015/11/14



Notes: LC25 & LC50, concentrations lethal to 25% and 50% of the test population



The test data and results are authorized and verified correct.

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Test Conditions

Client: FER116 Reference: 15-1545-01-TRD

Method:	Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, 2000. Environment Canada, EPS 1/RM/13.
	Second Edition (amended May 2007).
Test type:	Trout 96-h Static Acute Test (WTR-ME-041)
Species:	Oncorhynchus mykiss
Organism source:	Sam Livingston (Batch 201510281R)
Acclimation:	13 days (must be ≥ 2 weeks)
Stock mortality:	0% (seven days preceding testing)
Sample initial chemistry:	pH: 6.6; EC: 576 (µS/cm @ 25°C); DO: 8.4 (mg/L); temperature: 15 °C hardness (mg CaC03/L): 200; colour: yellow; odour: odourless
Sample holding time:	5 days (must be ≤ 5 days)
Sample storage:	4 ± 2°C in darkness
Test vessel:	The test was conducted in 22 L plastic pails with polyethylene liners
l est volume:	20 Litres (depth of solution in each test vessel ≥15cm)
Sample pre-treatment:	All test solutions and controls were pre-aerated for 30 minutes at 6.5 ±1 mL/min/L Dissolved oxygen in 100 % sample was 8.9 mg/L after pre-aeration
	The sample was not filtered or pH adjusted prior to or during testing
Loading density:	0.204 g/Litre (must be $\leq 0.5 \text{ g/Litre}$)
Control/dilution water:	Dechlorinated City of Calgary water acclimated to test conditions
Test concentrations:	5 effluent concentrations (6.3, 12.5, 25, 50, 100% (v/v) plus a negative control)
Test replicates:	One replicate per treatment; 10 fish per replicate
Feeding:	Fish are not fed 24 hours before test initiation and no feeding during test
Measurements:	pH, conductivity, dissolved oxygen and temperature measured at test initiation and test termination
Aeration:	All treatments aerated at 6.5 ±1 mL/min/L by oil-free compressed air passed through airline tubes connected to disposable air stones
Lighting:	Overhead full spectrum fluorescent lights
Photoperiod:	16h light:8h dark
Test temperature:	15 ± 1°C
Endpoint:	Mortality, 96-h LC50 (with 95% confidence limits)
Test validity:	The control had 100% survival (must \geq 90%) The control had 0 percent (%) stressed behaviour (must \leq 10%)
Reference toxicant:	96-h test with Potassium Chloride (KCl) initiated November 18, 2015; current results (96-h LC50 and 95% confidence limits) = 0.51 (0.42-0.58) log (g/L KCl) historical results: (96-h LC50 and 95% confidence limits) = 0.57 (0.50-0.64) log (g/L KCl)

Note: Outlined sections are protocol deviations explained on the comment page; v/v, volume per volume

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Test Data

Client: FER116 Reference: 15-1545-01-TRD

Test Log:						
Da	ate	Day	Time	Technician		
2015/	/11/10	0	0930	CQ		
2015/	/11/11	1	0900		JN	
2015/	/11/12	2	0740		JN	
2015/	/11/13	3	0845		JN	
2015/	/11/14	4	0910		JN	
Chomistry						
Conc. (%)	control	6.3	13	25	50	100
Dav				pH (units)		
0 [7.1	7.1	7.2	7.2	7.3	7.5
4	8.2	8.1	8.1	8.1	8.1	8.0
			Conduct	ivity (µS/cm (@ 25°C)	
0	417	437	447	470	520	606
4	413	404	409	430	472	555
			Dissol	430 ved Oxygen (mg/L)	
0	8.9	8.9	9.0	9.0	8.9	8.9
4	8.6	8.7	8.8	8.8	8.8	8.8
_			Те	mperature (°	C)	
0	14	14	14	14	14	14
4	14	14	14	14	14	14
Number Al	live (In brac	kets numb	er stressed):		
Conc. (%)	control	6.3	13	25	50	100
Day						
0	10	10	10	10	10	10
1	10	10	10	10	10	10
2	10	10	10	10	10	10
3	10	10	10	10	10	9
4	10	10	8	9	10	8
•				Mortality (%)		
4	0	0	20	10	0	20
L				Stressed (%)		
4	0	0	0	0	0	0
	-	-	-	~ 1	- 1	

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Biology Summary Tables:

Control	Length	Wet						
Fish	(cm)	Weight(g)						
1	2.9	0.3						
2	3.5	0.5						
3	3.1	0.4						
4	3.2	0.4						
5	3.7	0.6						
6	3.3	0.4						
7	3.0	0.3						
8	3.5	0.5						
9	3.3	0.4						
10	2.7	0.2						
	2.0	0.4						

average	3.2	0.4
sd	0.3	0.1
cv(%)	9.5	28.6

Notes: nd, not done; na, not applicable; sd, standard deviation; cv(%), coefficient of variation

Test Data

Conc. (%)	Group Wet
	Weight (g)
control	4.1
6.3	3.7
13	3.3
25	3.8
50	3.4
100	3.9

Client: FER116 Reference: 15-1545-01-TRD

Comments/Statistics

Test Result Comments:

None

Data Analysis:

Endpoints for mortality could not be calculated. No effect occurred.

Protocol Deviations:

The fish were held for less than 14 days prior to test initiation

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- 13. Samples: The quality, condition, content and source of samples stored and tested are not known to HydroQual except as declared and described on the Chain of Custody completed and submitted by the Client and accompanying the sample.
- 14. Risk of Loss: HydroQual will use reasonable care to protect samples during storage, however, all samples are stored at the Client's risk and the Client is responsible for obtaining appropriate insurance, if desired. The Client acknowledges that during the performance of the Services samples may be altered, lost, damaged or destroyed and the client forever releases HydroQual from any and all claims the Client may have for any loss or damage to the sample.
- 15. Environmental: the Client must comply with all applicable environmental legislation, including labeling all hazardous samples to comply with Canada's *Workplace Hazardous Materials Information System* and the Alberta *Transfer of Dangerous Goods* regulations, and must provide appropriate material safety data sheets that include the nature of the hazard and a contact name and phone number to call for information. The Client shall defend, indemnify and hold harmless HydroQual for all loss or damages, including any fine or cost of complying with an order of any government authority, resulting from the Client's breach of this paragraph.
- 16. Hazardous Materials Disposal: HydroQual may return, at the Client's cost, hazardous material to the Client for disposal.
- 17. Hazardous Materials Surcharge: HydroQual may apply an additional surcharge for handling of hazardous samples or samples with Naturally Occurring Radioactive Materials ("NORM"), such as and including without limitation, H₂S and CN.
- 18. Sample Containers: HydroQual may ship sample containers to the Client's location by the most cost effective means using HydroQual's preferred courier suppliers, within the specified project timeline. Shipping will be charged back to the Client.
- 19. Additional Charges: HydroQual may charge the Client:

(a) for pick-up and delivery services when provided subject in each instance to a minimum charge of \$50.00; and,

(b) for rush service (processing samples and/or reporting).

- 20. Large Bottle Orders: The Client shall provide HydroQual with not less than 24 hours' notice for large bottle orders.
- 21. Re-Tests: HydroQual reserves the right to re-test any samples that remain in HydroQual's possession. Re-tests requested by the Client may be charged to Client and Client agrees to pay for such charges.
- 22. Waiver: The Client is responsible for making any assessment regarding the suitability of the Services and the intended results for the Client's purposes and waives any and all claims against HydroQual that the Client may have against HydroQual as a result of the interpretation of the results provided to the Client. The Client shall defend, indemnify and save harmless HydroQual for any and all claims made by any third party against HydroQual in respect of all losses however arising from the performance of the Services or the use of any report provided in the performance of the Services.
- 23. LIMITATION OF LIABILITY: IN NO EVENT SHALL HYDROQUAL BE RESPONSIBLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY OR PUNITIVE DAMAGES, WHETHER FORESEEABLE OR UNFORESEEABLE (INCLUDING CLAIMS FOR LOSS OF PROFITS OR REVENUE OR LOSSES CAUSED BY STOPPAGE OF OTHER WORK OR IMPAIRMENT OF OTHER ASSETS) INCURRED BY THE CLIENT ARISING OUT OF BREACH OR FAILURE OF EXPRESS OF IMPLIED WARRANTY, BREACH OF CONTRACT, BREACH OF WARRANTY, MISREPRESENTATION, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE. IN ANY EVENT, THE LIABILITY OF HYDROQUAL TO THE CLIENT SHALL BE LIMITED TO THE COST OF TESTING THE SAMPLE AS REQUESTED IN THE CHAIN OF CUSTODY UNDER WHICH THE SAMPLE WAS ORIGINALLY DEPOSITED. FOR THE PURPOSES OF THIS PARAGRAPH AND PARAGRAPHS 7, 14, 15, 22, AND 24, AS APPLICABLE, "HYDROQUAL" INCLUDES WITHOUT LIMITATIONS ITS DIRECTORS, OFFICERS, EMPLOYEES AND AFFILIATES AND THE "CLIENT" INCLUDES WITHOUT LIMITATION ANY THIRD PARTY THAT MAY HAVE A CLAIM AGAINST HYDROQUAL THROUGH THE CLIENT.
- 24. Notice of Liability: Notwithstanding paragraph 23, HydroQual shall not be liable to the Client unless the Client provides notice in writing to HydroQual of such loss or damage, together with full particulars thereof, within 30 days of the Client's receipt of the report of the analysis of the sample giving rise to such liability. The provisions of this paragraph allocate the risk between the Client and HydroQual, and the fees to be paid by the Client to HydroQual reflect this allocation of any such risks and the limitations of liability in these General Terms and Conditions.
- 25. Entire Agreement: These General Terms and Conditions, the Chain of Custody and price quotations constitute the entire agreement between the parties and supersede and take precedence over any terms and conditions contained in any documentation provided by the Client. HydroQual's execution of any subsequent documentation from the Client only acknowledges receipt and not acceptance of any terms or conditions therein unless expressly stipulated otherwise by HydroQual. If there is a conflict between these General Terms and Conditions and any other document, these General Terms and Conditions prevail.



FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received: 23-DEC-14 Report Date: 02-JAN-15 11:52 (MT) Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1561564

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: NOT SUBMITTED FARUC - WINTER 2014 EMS WEEK 1

Lyudmyla Shvets Account Manager

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FARUC - WINTER 2014 EMS WEEK 1

L1561564 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 21-DEC-14 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	233		2.0	mg/L		23-DEC-14	R3125440
Total Suspended Solids	349	DLM	11	mg/L		24-DEC-14	R3125330
рН	7.72		0.10	pН		23-DEC-14	R3127016
L1561564-2 WWTP EFFLUENT							
Sampled By: HB on 21-DEC-14 @ 14:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-DEC-14	R3126634
Biochemical Oxygen Demand	<2.0		2.0	mg/L		23-DEC-14	R3125440
Chemical Oxygen Demand	13		10	mg/L		29-DEC-14	R3125819
Orthophosphate-Dissolved (as P)	0.549	DLA	0.050	mg/L		24-DEC-14	R3125162
Coliform Bacteria - Fecal	<1		1	CFU/100mL		23-DEC-14	R3125186
Phosphorus (P)-Total	0.606	DLA	0.050	mg/L		31-DEC-14	R3126756
Total Suspended Solids	<3.0		3.0	mg/L		24-DEC-14	R3125330
	8.00		0.10	рН		23-DEC-14	R3127016
NO2, NO3 and Sum of NO2/NO3							
Nitrate in water by iC	29.6	DLA	0 10	ma/l		24-DEC-14	R3125702
Nitrate+Nitrite	2010		00				
Nitrate and Nitrite (as N)	29.6		0.11	mg/L		29-DEC-14	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLA	0.050	mg/L		24-DEC-14	R3125702
L1561564-3 ELKRIVER UPSTREAM							
Sampled By: HB on 21-DEC-14 @ 15:45							
Matrix: WATER							
Miscellaneous Parameters			0.050	ma/l		20 050 14	D2400024
Ammonia, Tolai (as N) Orthophognhoto Discolvod (as R)	< 0.050		0.050	mg/L		30-DEC-14	R3120034
Coliform Bacteria - Fecal	<0.005	OCB	0.0050	CELI/100ml		24-DEC-14	R3125102
Phosphorus (P)-Total	0 0000	OOK	0.0050	ma/l		23-DEC-14	R3125100
Total Suspended Solids	<3.0		3.0	mg/L		24-DEC-14	R3125330
pH	8.34		0.0	ng/L		23-DEC-14	R3127016
NO2, NO3 and Sum of NO2/NO3	0.0.1		00	P			
Nitrate in Water by IC							
Nitrate (as N)	1.21		0.020	mg/L		23-DEC-14	R3125033
Nitrate+Nitrite	4.04		0.050				
Nitrate and Nitrite (as N)	1.21		0.050	mg/∟		24-DEC-14	
Nitrite (as N)	<0.010		0.010	mg/L		23-DEC-14	R3125033
L1561564-4 ELKRIVER OUTFALL							
Sampled By: HB on 21-DEC-14 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-DEC-14	R3126634
Orthophosphate-Dissolved (as P)	0.0104		0.0050	mg/L		24-DEC-14	R3125162
Coliform Bacteria - Fecal	10	OCR	1	CFU/100mL		23-DEC-14	R3125186
Phosphorus (P)-Total	0.0151		0.0050	mg/L		31-DEC-14	R3126756
Total Suspended Solids	<3.0		3.0	mg/L		24-DEC-14	R3125330

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1561564-4 ELKRIVER OUTFALL Sampled By: HB on 21-DEC-14 @ 15:00							
pH NO2, NO3 and Sum of NO2/NO3	8.33		0.10	рН		23-DEC-14	R3127016
Nitrate in Water by IC Nitrate (as N)	1.37		0.020	mg/L		23-DEC-14	R3125033
Nitrate+Nitrite Nitrate and Nitrite (as N)	1.37		0.050	mg/L		24-DEC-14	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		23-DEC-14	R3125033
L1561564-5 ELKRIVER DOWNSTREAM Sampled By: HB on 21-DEC-14 @ 14:45							
Matrix: WATER Miscellaneous Parameters Ammonia, Total (as N) Orthophosphate-Dissolved (as P) Coliform Bacteria - Fecal Phosphorus (P)-Total Total Suspended Solids pH NO2, NO3 and Sum of NO2/NO3 Nitrate in Water by IC Nitrate (as N) Nitrate and Nitrite (as N) Nitrite in Water by IC Nitrite in Water by IC Nitrite (as N)	<0.050 <0.0050 1 0.0074 <3.0 8.39 1.52 1.52 <0.010	OCR	0.050 0.0050 1 0.0050 3.0 0.10 0.020 0.050 0.010	mg/L mg/L CFU/100mL mg/L pH mg/L mg/L mg/L		30-DEC-14 24-DEC-14 31-DEC-14 24-DEC-14 23-DEC-14 23-DEC-14 24-DEC-14 23-DEC-14	R3126634 R3125162 R3125186 R3126756 R3125330 R3127016 R3125033 R3125033

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Descript	tion					
EHR	FCC TES	FCC TEST FOR SAMPLES -2-5 - Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested					
Sample Param	eter Qualifier K	Key:					
Qualifier	Description						
DLA	Detection Limit a	adjusted for required dilution					
DLM	Detection Limit A	Adjusted due to sample matrix effects.					
OCR	Parameter is out	of client specific range.					
Test Method R	eferences:						
ALS Test Code	Matri	x Test Description	Method Reference**				
BOD-CL	Water	Biochemical Oxygen Demand (BOI	0) APHA 5210 B-5 day IncubO2 electrode				
This analysis is o oxygen demand dissolved oxyge BOD (CBOD) is	carried out using p (BOD) are determ n meter. Dissolvec determined by add	procedures adapted from APHA Method 52 nined by diluting and incubating a sample for d BOD (SOLUBLE) is determined by filterin ding a nitrification inhibitor to the diluted sa	10B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical or a specified time period, and measuring the oxygen depletion using a g the sample through a glass fibre filter prior to dilution. Carbonaceous mple prior to incubation.				
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D-Micro Colorimetry				
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222B MF				
This analysis is of Coliform bacteria involves an initia bacteria (Fecal)	carried out using p a is enumerated by Il 24 hour incubation and is used for no	procedures adapted from APHA Method 92 y culturing and colony counting. A known s on at 44.5 degrees C of the filter with the a n-turbid water with a low background bacte	22 "Membrane Filter Technique for Members of the Coliform Group". ample volume is filtered through a 0.45 micron membrane filter. The test ppropriate growth medium. This method is specific for thermotolerant eria level.				
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION				
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry				
Ammonia is dete sample.	ermined using the	Phenate colorimetric method. Result inclu	des both ionized (NH4+) and un-ionized (NH3) ammonia present in the				
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)				
Inorganic anions	are analyzed by I	on 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 I	on Chromatography with conductivity and/	or UV detection.				
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS				
This analysis is opersulphate dige	carried out using p estion of the sampl	procedures adapted from APHA Method 45 le.	00-P "Phosphorus". Total Phosphorus is determined colourimetrically after				
PH-CL	Water	рН	APHA 4500 H-Electrode				
PO4-DO-COL-C	L Water	Diss. Orthophosphate in Water by 0	Colour APHA 4500-P PHOSPHORUS				
This analysis is colourimetrically	carried out using p on a sample that	procedures adapted from APHA Method 45 has been lab or field filtered through a 0.45	00-P "Phosphorus". Dissolved Orthophosphate is determined 5 micron membrane filter.				
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric				
This analysis is ((TSS) are deterr	carried out using p nined by filtering a	procedures adapted from APHA Method 25 a sample through a glass fibre filter, and by	40 "Solids". Solids are determined gravimetrically. Total suspended solids drying the filter at 104 deg. C.				
** ALS test metho	ds may incorporat	e modifications from specified reference m	ethods to improve performance.				
The last two lette	ers of the above te	est code(s) indicate the laboratory that per	formed analytical analysis for that test. Refer to the list below:				
Laboratory Defi	nition Code	Laboratory Location					
CL	Ā	ALS ENVIRONMENTAL - CALGARY, ALB	ERTA, CANADA				

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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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

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t McMurrey AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586 nonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311 jary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Totl Free: 1-800-668-9878 Fax: 403-291-0298 katoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Totl Free: 1-800-667-7645 Fax: 306-668-8383

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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:02-JAN-15Report Date:09-JAN-15 12:31 (MT)Version:FINAL

Client Phone: 403-256-8473

Certificate of Analysis

Lab Work Order #: L1563452

Project P.O. #: Job Reference: NOT SUBMITTED FERNIE ALPINE RESORT - WINTER 14/15 EMS WK 2

C of C Numbers: Legal Site Desc:

Lyudmyla Shvets Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 01- IAN-15 @ 15:20							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	340		2.0	mg/L		02-JAN-15	R3128463
Total Suspended Solids	423	DLM	15	mg/L		05-JAN-15	R3128258
рН	7.92		0.10	pH		06-JAN-15	R3128542
L1563452-2 WWTP EFFLUENT							
Sampled By: BC on 01-JAN-15 @ 15:25							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		05-JAN-15	R3127806
Biochemical Oxygen Demand	<2.0		2.0	mg/L		02-JAN-15	R3128463
Chemical Oxygen Demand	18		10	mg/L		06-JAN-15	R3128151
Orthophosphate-Dissolved (as P)	0.64	DLA	0.10	mg/L		02-JAN-15	R3127198
Coliform Bacteria - Fecal	1	OCR	1	CFU/100mL		02-JAN-15	R3127411
Phosphorus (P)-Total	0.684	DLA	0.050	mg/L		08-JAN-15	R3129349
Total Suspended Solids	<3.0		3.0	mg/L		05-JAN-15	R3128258
pH	8.04		0.10	pН		06-JAN-15	R3128542
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	42.8		0 020	ma/l		02-JAN-15	R3127675
	42.0		0.020	ing/E		02 0/11 10	10121013
Nitrate and Nitrite (as N)	42.8		0.050	mg/L		05-JAN-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		02-JAN-15	R3127675
L1563452-3 ELK RIVER UPSTREAM							
Sampled By: BC on 01-JAN-15 @ 14:55							
Matrix: WATER							
Miscellaneous Parameters							50/05000
Ammonia, Total (as N)	< 0.050		0.050	mg/L		05-JAN-15	R3127806
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		02-JAN-15	R3127198
Comornia Bacteria - Fecal	<1		1	CFU/100mL		02-JAN-15	R3127411
Total Suspended Solids	<0.0050		0.0050	mg/L		06-JAN-15	R3129349
nH	<3.0 0.27		0.10	niy/∟ n⊔		05-JAN-15	R3120230
NO2. NO3 and Sum of NO2/NO3	0.57		0.10	pri		00-0411-10	K3120342
Nitrate in Water by IC							
Nitrate (as N)	1.35		0.020	mg/L		02-JAN-15	R3127675
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.35		0.050	mg/L		05-JAN-15	
Nitrite in Water by IC	<0.010		0.010	ma/l		02- IAN-15	D3127675
	-0.010		0.010	ing/L		02-0741-10	1(3127073
$ \begin{array}{llllllllllllllllllllllllllllllllllll$							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		05-JAN-15	R3127806
Orthophosphate-Dissolved (as P)	0.182	DLA	0.010	mg/L		02-JAN-15	R3127198
Coliform Bacteria - Fecal	9	OCR	1	CFU/100mL		02-JAN-15	R3127411
Phosphorus (P)-Total	0.196	DLA	0.010	mg/L		08-JAN-15	R3129349
Total Suspended Solids	<3.0		3.0	mg/L		05-JAN-15	R3128258

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1563452-4 ELK RIVER @ OUTFALL							
Sampled By: BC on 01-JAN-15 @ 15:05							
Matrix: WATER							
pH NO2_NO3 and Sum of NO2/NO3	8.24		0.10	рН		06-JAN-15	R3128542
Nitrate in Water by IC							
Nitrate (as N)	13.0		0.020	mg/L		02-JAN-15	R3127675
Nitrate+Nitrite Nitrate and Nitrite (as N)	13.0		0.050	mg/L		05-JAN-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0 010	ma/L		02-JAN-15	R3127675
L1563452-5 ELK RIVER DOWNSTREAM				3			
Sampled By: BC on 01-JAN-15 @ 15:15							
Matrix: WATER							
Ammonia. Total (as N)	<0.050		0.050	ma/L		05-JAN-15	R3127806
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		02-JAN-15	R3127198
Coliform Bacteria - Fecal	2	OCR	1	CFU/100mL		02-JAN-15	R3127411
Phosphorus (P)-Total	0.0084		0.0050	mg/L		08-JAN-15	R3129349
Total Suspended Solids	<3.0		3.0	mg/L		05-JAN-15	R3128258
pH	8.39		0.10	рН		06-JAN-15	R3128542
Nitrate in Water by IC							
Nitrate (as N)	1.47		0.020	mg/L		02-JAN-15	R3127675
Nitrate+Nitrite	1 47		0.050	mg/l		05- IAN-15	
Nitrite in Water by IC	1.47		0.050	mg/L		05-JAN-15	
Nitrite (as N)	<0.010		0.010	mg/L		02-JAN-15	R3127675

Qualifiers for Individual Samples Listed: Sample Numbe Client ID Qualifier Description ELK RIVER UPSTREAM TOTAL P, NH3 - Sample was Preserved at the laboratory SPL L1563452-3 Sample Parameter Qualifier Key: Qualifier Description DLA Detection Limit adjusted for required dilution DLM Detection Limit Adjusted due to sample matrix effects. OCR Parameter is out of client specific range. **Test Method References:** ALS Test Code Matrix Method Reference** **Test Description** BOD-CL Water Biochemical Oxygen Demand (BOD) 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. COD-CL Water Chemical Oxygen Demand APHA 5220 D-Micro Colorimetry FCC-MF-CL APHA 9222B MF Water Fecal Coliform Count-MF 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 NH4-CI Water Ammonia-N APHA 4500 NH3F-Colorimetry Ammonia is determined using the Phenate colorimetric method. Result includes both ionized (NH4+) and un-ionized (NH3) ammonia present in the sample. 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. PH-CL Water APHA 4500 H-Electrode pН 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 Enuiro ANALYTICAL CHEMISTRY & T

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L1563452-COFC

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S BC, Box 256, 9831 - 98A Avenue, V1J 6W7, Tel; 250-261-5517 Fax: 250-261-5587

· AB, 9595 - 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 Fax: 780-513-2191

y AB, Bay 1, 245 Macdonald Cr, T9H 485, Tel: 780-791-1524 Fax: 780-791-1586

i, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toil Free: 1-800-668-9878 Fax: 780-437-2311

ay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298

k, 819 - 58th Street East, S7K 6X5, Tel: 306-868-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

CHAIN OF CUSTODY FORM

PAGE

OF

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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:09-JAN-15Report Date:16-JAN-15 14:50 (MT)Version:FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1565537

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: NOT SUBMITTED FARUC - WINTER 2014 EMS WEEK 3

Lyudmyla Shvets Account Manager

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FARUC - WINTER 2014 EMS WEEK 3

L1565537 CONTD.... PAGE 2 of 5 Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1565537-1 WWTP INFLUENT							
Sampled By: HB on 07-JAN-15 @ 14:00							
Matrix: WATER							
Riscenaries Cyves Domand	252		2.0	ma/l		00 14 15	D2121641
	252		2.0	mg/L		14 IAN 15	R3131041
	7 70		0.10	nig/∟ n⊔		14-JAN-15	R3132011
	1.19		0.10	pri		14-JAN-13	K3131039
LIS0SS37-2 WWVIP EFFLUENI							
Sampled By. HB OIL 07-JAN-15 @ 14.15							
Matrix: WATER Miscellaneous Parameters							
Ammonia Total (as N)	<0.050		0.050	ma/l		14IAN-15	R3131487
Biochemical Oxygen Demand	<2.0		2.0	mg/L		09-JAN-15	R3131641
Chemical Oxygen Demand	<10		10	mg/L		12-JAN-15	R3130528
Orthophosphate-Dissolved (as P)	0.516	DLA	0.050	ma/l		10-JAN-15	R3130135
Coliform Bacteria - Fecal	<1		1	CFU/100ml		09-JAN-15	R3130770
Phosphorus (P)-Total	0 559	DLA	0.050	mg/l		15-JAN-15	R3132146
Total Suspended Solids	<3.0		3.0	mg/L		14-JAN-15	R3132011
pH	8.08		0.10	ng/E		14-JAN-15	R3131839
NO2, NO3 and Sum of NO2/NO3	0.00		0110	P			
Nitrate in Water by IC							
Nitrate (as N)	39.3	DLA	0.10	mg/L		09-JAN-15	R3130988
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	39.3		0.11	mg/L		13-JAN-15	
Nitrite in Water by IC	<0.050		0.050	ma/l		00 14 15	D2120088
	<0.050		0.050	iiig/∟		09-JAN-15	K3130900
L 1505537-3 ELKRIVER UPSTREAM							
Matrix MATED							
Matrix. WATER Miscellaneous Parameters							
Ammonia Total (as N)	<0.050		0.050	ma/l		14IAN-15	R3131487
Orthophosphate-Dissolved (as P)	<0.000		0.000	mg/L		10-JAN-15	R3130135
Coliform Bacteria - Fecal	<1		1	CFU/100ml		09-JAN-15	R3130770
Phosphorus (P)-Total	0.0073		0.0050	ma/L		15-JAN-15	R3132146
Total Suspended Solids	<3.0		3.0	mg/L		14-JAN-15	R3132011
Н	8.43		0.10	Ha		14-JAN-15	R3131839
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.80		0.020	mg/L		09-JAN-15	R3130988
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.80		0.050	mg/L		13-JAN-15	
Nitrite in water by iC	<0.010		0.010	ma/l		09-JAN-15	R3130988
	-0.010		0.010				110100000
Sampled By: HB on 07_1 [AN-15 @ 14:45							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	ma/L		14-JAN-15	R3131487
Orthophosphate-Dissolved (as P)	0.0702		0.0050	ma/L		10-JAN-15	R3130135
Coliform Bacteria - Fecal	3	OCR	1	CFU/100mL		09-JAN-15	R3130770
Phosphorus (P)-Total	0.0730		0.0050	mg/L		15-JAN-15	R3132146
Total Suspended Solids	<3.0		3.0	mg/L		14-JAN-15	R3132011
				-			

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
1 1565537-4 ELKRIVER OUTEALL							
Sampled By: HB on 07-JAN-15 @ 14:45							
Matrix: WATER							
рН	8.35		0.10	pН		14-JAN-15	R3131839
NO2, NO3 and Sum of NO2/NO3							
Nitrate In Water by IC Nitrate (as N)	4.75		0.020	mg/L		09-JAN-15	R3130988
Nitrate+Nitrite				0			
Nitrate and Nitrite (as N)	4.75		0.050	mg/L		13-JAN-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		09-JAN-15	R3130988
L1565537-5 ELKRIVER DOWNSTREAM							
Sampled By: HB on 07-JAN-15 @ 15:00							
Matrix: WATER							
Ammonia. Total (as N)	<0.050		0.050	ma/l		14-JAN-15	R3131487
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		10-JAN-15	R3130135
Coliform Bacteria - Fecal	<1		1	CFU/100mL		09-JAN-15	R3130770
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		15-JAN-15	R3132146
Total Suspended Solids	<3.0		3.0	mg/L		14-JAN-15	R3132011
pH	8.47		0.10	рН		14-JAN-15	R3131839
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by iC	1.80		0.020	mg/L		09-JAN-15	R3130988
Nitrate+Nitrite				5			
Nitrate and Nitrite (as N) Nitrite in Water by IC	1.80		0.050	mg/L		13-JAN-15	
Nitrite (as N)	<0.010		0.010	mg/L		09-JAN-15	R3130988

Qualifiers for Sample Submission Listed:

Qualifier	Descrip	otion		
EHR	FCC FC)R -2-5 - E>	cceeded Recommended Holding Time On	Receipt: Proceed With Analysis As Requested
Sample Param	eter Qualifier	Key:		
Qualifier	Description			
DLA	Detection Limit	adjusted fo	r required dilution	
MS-B	Matrix Spike ree	covery coul	d not be accurately calculated due to high	analyte background in sample.
OCR	Parameter is ou	ut of client s	specific range.	
Test Method R	eferences:			
ALS Test Code	Mat	rix Tes	st Description	Method Reference**
BOD-CL	Wate	er Bio	chemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand dissolved oxyge BOD (CBOD) is	carried out using (BOD) are detern n meter. Dissolve determined by ac	procedures mined by di ed BOD (SC dding a nitri	adapted from APHA Method 5210B - "Bio luting and incubating a sample for a speci DLUBLE) is determined by filtering the san fication inhibitor to the diluted sample prio	ochemical Oxygen Demand (BOD)". All forms of biochemical fied time period, and measuring the oxygen depletion using a aple through a glass fibre filter prior to dilution. Carbonaceous r to incubation.
COD-CL	Wate	er Ch	emical Oxygen Demand	APHA 5220 D-Micro Colorimetry
FCC-MF-CL	Wate	er Feo	cal Coliform Count-MF	APHA 9222D
This analysis is of Coliform bacteria involves an initia bacteria (Fecal)	carried out using a is enumerated b Il 24 hour incubat and is used for n	procedures by culturing ion at 44.5 on-turbid w	adapted from APHA Method 9222 "Memi and colony counting. A known sample vo degrees C of the filter with the appropriate ater 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
N2N3-CALC-CL	Wate	er Niti	rate+Nitrite	CALCULATION
NH4-CL	Wate	er Am	imonia-N	APHA 4500 NH3F-Colorimetry
Ammonia is dete sample.	ermined using the	e Phenate c	olorimetric method. Result includes both	ionized (NH4+) and un-ionized (NH3) ammonia present in the
NO2-IC-N-CL	Wate	er Niti	rite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by	Ion Chrom	atography with conductivity and/or UV det	ection.
NO3-IC-N-CL	Wate	er Niti	rate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by	Ion Chrom	atography with conductivity and/or UV det	ection.
P-T-COL-CL	Wate	er Tot	al P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is opersulphate dige	carried out using	procedures	adapted from APHA Method 4500-P "Pho	osphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Wate	er pH		APHA 4500 H-Electrode
PO4-DO-COL-C	L Wate	er Dis	s. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using on a sample that	procedures t has been	adapted from APHA Method 4500-P "Philab or field filtered through a 0.45 micron r	osphorus". Dissolved Orthophosphate is determined nembrane filter.
TSS-CL	Wate	er Tot	al Suspended Solids	APHA 2540 D-Gravimetric
This analysis is ((TSS) are deterr	carried out using nined by filtering	procedures a sample th	adapted from APHA Method 2540 "Solid: nrough 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 incorpora	ate modifica	ations from specified reference methods to	improve performance.
The last two lette	ers of the above a	test code(s,) indicate the laboratory that performed ar	alytical analysis for that test. Refer to the list below:
Laboratory Defi	nition Code	Laborator	y Location	
CL		ALS ENVI	RONMENTAL - CALGARY, ALBERTA, C/	

Chain of Custody Numbers:

- CALGARY, ALBERTA, CANADA

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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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

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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:15-JAN-15Report Date:22-JAN-15 16:13 (MT)Version:FINAL

Client Phone: 403-256-8473

Certificate of Analysis

Lab Work Order #: L1567408

Project P.O. #: Job Reference: NOT SUBMITTED FERNIE ALPINE RESORT - WINTER 14/15 EMS WK 4

C of C Numbers: Legal Site Desc:

Lyudmyla Shvets Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: BC on 14- $IAN-15 @ 15:10$							
Matrix: WATER							
Mainter Marcine Marcin							
Biochemical Oxygen Demand	140		2.0	ma/L		15-JAN-15	R3135055
Total Suspended Solids	192		9.0	mg/L		21-JAN-15	R3136368
pH	8.07		0.10	pH		15-JAN-15	R3132366
L1567408-2 WWTP EFFLUENT							
Sampled By: BC on 14-JAN-15 @ 15:15							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		22-JAN-15	R3136583
Biochemical Oxygen Demand	<2.0		2.0	mg/L		15-JAN-15	R3135055
Chemical Oxygen Demand	11		10	mg/L		21-JAN-15	R3136327
Orthophosphate-Dissolved (as P)	0.108		0.0050	mg/L		15-JAN-15	R3132022
Coliform Bacteria - Fecal	<1		1	CFU/100mL		15-JAN-15	R3132725
Phosphorus (P)-Total	0.142	DLA	0.010	mg/L		21-JAN-15	R3135383
Total Suspended Solids	<3.0		3.0	mg/L		21-JAN-15	R3136368
рН	7.84		0.10	pН		15-JAN-15	R3132366
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	30.8		0.020	ma/l		15- IAN-15	D3133149
	39.0		0.020	ing/L		13-341-13	K3133140
Nitrate and Nitrite (as N)	39.9		0.050	mg/L		18-JAN-15	
Nitrite in Water by IC				_			
Nitrite (as N)	0.100		0.010	mg/L		15-JAN-15	R3133148
L1567408-3 ELKRIVER @ OUTFALL							
Sampled By: BC on 14-JAN-15 @ 14:55							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		22-JAN-15	R3136583
Orthophosphate-Dissolved (as P)	0.0204		0.0050	mg/L		15-JAN-15	R3132022
Coliform Bacteria - Fecal	<1		1	CFU/100mL		15-JAN-15	R3132725
Phosphorus (P)- Lotal	0.0220		0.0050	mg/L		21-JAN-15	R3135383
l otal Suspended Solids	<3.0		3.0	mg/L		21-JAN-15	R3136368
µ⊓ NO2_NO3 and Sum of NO2/NO3	8.23		0.10	рп		15-JAN-15	R3132300
Nitrate in Water by IC							
Nitrate (as N)	5.14		0.020	mg/L		15-JAN-15	R3133148
Nitrate+Nitrite				_			
Nitrate and Nitrite (as N)	5.14		0.050	mg/L		18-JAN-15	
Nitrite in Water by IC	10.010		0.040	···· ·· //			D0400440
	<0.010		0.010	mg/L		15-JAN-15	K3133140
L 100/408-4 ELKRIVER DOWNSTREAM							
Sampled By: BC on 14-JAIN-15 @ 14:50							
Mathx: WATER Miscellaneous Parameters							
Ammonia Total (as N)	<0.050		0.050	ma/l		22-,IAN-15	R3136583
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	ma/l		15-JAN-15	R3132022
Coliform Bacteria - Fecal	<1		1	CFU/100ml		15-JAN-15	R3132725
Phosphorus (P)-Total	0 0064		0.0050	ma/L		21-JAN-15	R3135383
Total Suspended Solids	3.3		3.0	mg/L		21-JAN-15	R3136368
			-				

L1567408-4 ELKRIVER DOWNSTREAM Sampled By: BC on 14-JAN-15 @ 14:50 Matrix: WATER pH	R3132366 R3133148
pH8.380.10pH15-JAN-15NO2, NO3 and Sum of NO2/NO3Nitrate in Water by IC Nitrate (as N)0.7870.020mg/L15-JAN-15Nitrate+Nitrite Nitrate and Nitrite (as N)0.7870.050mg/L18- IAN-15	R3132366 R3133148
Nitrate in Water by IC 0.787 0.020 mg/L 15-JAN-15 Nitrate+Nitrite 0.787 0.050 mg/L 18- JAN-15	R3133148
Nitrate and Nitrite (as N) 0787 0.050 mg/l 18- IAN-15	
Nitrite in Water by IC	
Nitrite (as N) <0.010 0.010 mg/L 15-JAN-15	R3133148

Sample Parameter Qualifier Key:

Qualifier	Description		
DLA	Detection Limit adjus	ted for required dilution	
DLM	Detection Limit Adjus	ted due to sample matrix effects.	
est Method F	References:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-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 determined by adding	dures adapted from APHA Method 5210B - "Bi by diluting and incubating a sample for a speci D (SOLUBLE) is determined by filtering the san 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 nple through a glass fibre filter prior to dilution. Carbonaceous r to incubation.
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D-Micro Colorimetry
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is Coliform bacteri 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 appropriate bid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". lume 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
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
Ammonia is det sample.	ermined using the Pher	nate colorimetric method. Result includes both	ionized (NH4+) and un-ionized (NH3) ammonia present in the
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
norganic anion	s are analyzed by lon C	Chromatography with conductivity and/or UV del	tection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
norganic anion	s are analyzed by lon C	Chromatography with conductivity and/or UV det	lection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate dig	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
PO4-DO-COL-C	CL Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using proce / on a sample that has l	dures adapted from APHA Method 4500-P "Ph 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 deter	carried out using proce mined by filtering a sam	dures adapted from APHA Method 2540 "Solid pple 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	ods may incorporate mo	odifications from specified reference methods to	improve performance.
The last two let	ters of the above test co	ode(s) indicate the laboratory that performed ar	nalytical analysis for that test. Refer to the list below:

CL ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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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.

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TEL:		403 - 256 - 8	1473	FA	x: 403 - 24	44 - 3774	SAMPLER:	Bo Choroszewski	1																	
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SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO					FO	R LAI	<u>B US</u>	EON	ILY		i			A												
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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:22-JAN-15Report Date:29-JAN-15 12:34 (MT)Version:FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1569971

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: NOT SUBMITTED FARUC - WINTER 2014 EMS WEEK 5

Lyudmyla Shvets Account Manager

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FARUC - WINTER 2014 EMS WEEK 5

L1569971 CONTD.... PAGE 2 of 5 Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1569971-1 WWIP INFLUENI							
Sampled By. HB 01121-JAN-15 @ 14.00							
Matrix: WATER Miscellaneous Parameters							
Riochemical Oxygen Demand	161		2.0	ma/l		23- IAN-15	P3130050
Total Suspended Solids	175		5.0	mg/L		22-JAN-15	R3137427
pH	8 16		0.10	nH		22-JAN-15	R3137228
	0.10		0.10	P		22 0/ 11 10	110107220
Sampled By: HB on 21- $IAN-15 @ 14:15$							
Mainter Marcine Ma Artifica Marcine Ma							
Ammonia. Total (as N)	<0.050		0 050	ma/L		22-JAN-15	R3136583
Biochemical Oxygen Demand	<2.0		20	ma/L		23-JAN-15	R3139950
Chemical Oxygen Demand	20		10	ma/L		23-JAN-15	R3137688
Orthophosphate-Dissolved (as P)	0.475	DLA	0.025	mg/L		23-JAN-15	R3138371
Coliform Bacteria - Fecal	<1		1	CFU/100mL		22-JAN-15	R3137876
Phosphorus (P)-Total	0.495	DLA	0.025	mg/L		27-JAN-15	R3139439
Total Suspended Solids	<3.0		3.0	ma/L		22-JAN-15	R3137427
рН	7.91		0.10	Hq		22-JAN-15	R3137228
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	41.1		0.020	mg/L		22-JAN-15	R3137882
Nitrate+Nitrite						00 1451 45	
Nitrate and Nitrite (as N)	41.1		0.050	mg/L		23-JAN-15	
Nitrite in water by IC Nitrite (as N)	0.014		0.010	ma/l		22-JAN-15	R3137882
	0.014		0.010			22 0/ 11 10	110107002
Sampled By: HB on 21 -IAN-15 @ 14:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		22-JAN-15	R3136583
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		23-JAN-15	R3138371
Coliform Bacteria - Fecal	<1		1	CFU/100mL		22-JAN-15	R3137876
Phosphorus (P)-Total	0.0079		0.0050	mg/L		27-JAN-15	R3139439
Total Suspended Solids	3.3		3.0	mg/L		22-JAN-15	R3137427
рН	8.44		0.10	pН		22-JAN-15	R3137228
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.91		0.020	mg/L		22-JAN-15	R3137882
Nitrate+Nitrite	1.01		0.050	ma/l		22 JANI 15	
Nitrite in Water by IC	1.91		0.050	ilig/∟		23-JAN-13	
Nitrite (as N)	<0.010		0.010	mg/L		22-JAN-15	R3137882
1 1569971-4 ELKRIVER OUTFALL							
Sampled By: HB on 21-JAN-15 @ 14:45							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		22-JAN-15	R3136583
Orthophosphate-Dissolved (as P)	0.0384		0.0050	mg/L		23-JAN-15	R3138371
Coliform Bacteria - Fecal	<1		1	CFU/100mL		22-JAN-15	R3137876
Phosphorus (P)-Total	0.0425		0.0050	mg/L		27-JAN-15	R3139439
Total Suspended Solids	<3.0		3.0	mg/L		22-JAN-15	R3137427

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1569971-4 ELKRIVER OUTFALL Sampled By: HB on 21- IAN-15 @ 14:45							
Matrix: WATER							
pH	8 34		0 10	рН		22-JAN-15	R3137228
NO2, NO3 and Sum of NO2/NO3	0.0.1		0110	P			
Nitrate in Water by IC							
Nitrate (as N)	4.42		0.020	mg/L		22-JAN-15	R3137882
Nitrate+Nitrite Nitrate and Nitrite (as N)	4 42		0.050	ma/L		23-JAN-15	
Nitrite in Water by IC			0.000				
Nitrite (as N)	<0.010		0.010	mg/L		22-JAN-15	R3137882
L1569971-5 ELKRIVER DOWNSTREAM							
Sampled By: HB on 21-JAN-15 @ 15:00							
Matrix: WATER							
Ammonia Total (as N)	<0.050		0.050	ma/l		22- IAN-15	D3136583
Orthophosphate-Dissolved (as P)	<0.050		0.050	mg/L		22-JAN-15	R3138371
Coliform Bacteria - Fecal	<1		1	CFU/100mL		22-JAN-15	R3137876
Phosphorus (P)-Total	0.0063		0.0050	mg/L		27-JAN-15	R3139439
Total Suspended Solids	<3.0		3.0	mg/L		22-JAN-15	R3137427
рН	8.47		0.10	pН		22-JAN-15	R3137228
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	1.04		0.000			00 1411 45	D2427002
Nitrate (as N)	1.94		0.020	mg/L		ZZ-JAIN-15	R3137882
Nitrate and Nitrite (as N)	1.94		0.050	mg/L		23-JAN-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		22-JAN-15	R3137882

Sample Parameter Qualifier Key:

Qualifier	Description		
DLA	Detection Limit adjust	ed for required dilution	
Test Method Re	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-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 proced (BOD) are determined n meter. Dissolved BOE determined by adding a	dures adapted from APHA Method 5210B - "Bio by diluting and incubating a sample for a specifi D (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.
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D-Micro Colorimetry
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is c Coliform bacteria involves an initial bacteria (Fecal) a	carried out using proceed is enumerated by culturated by culturated by culturated by culturated by culturated by culturated by and is used for non-turb	dures adapted from APHA Method 9222 "Memb uring and colony counting. A known sample volu 44.5 degrees C of the filter with the appropriate pid water with a low background bacteria level.	rane 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
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
Ammonia is dete sample.	rmined using the Phen	ate colorimetric method. Result includes both ic	onized (NH4+) and un-ionized (NH3) ammonia present in the
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 dete	ection.
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 dete	ection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c persulphate dige	arried out using proced stion of the sample.	dures adapted from APHA Method 4500-P "Pho	sphorus". Total Phosphorus is determined colourimetrically after
PH-CL	Water	рН	APHA 4500 H-Electrode
PO4-DO-COL-CL	_ Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c colourimetrically	arried out using proced on a sample that has b	dures adapted from APHA Method 4500-P "Pho een lab or field filtered through a 0.45 micron m	sphorus". 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 procee 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 filter at 104 deg. C.
** ALS test method	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 and	alytical analysis for that test. Refer to the list below:
Laboratory Defin	nition Code Labo	ratory Location	

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ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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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.

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FERNIE ALPINE RESORT UTILITIES CORPORATION ATTN: PATRICK MAJER 1505 - 17TH AVENUE SW CALGARY AB T2T 0E2 Date Received:29-JAN-15Report Date:05-FEB-15 13:56 (MT)Version:FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1572425

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: NOT SUBMITTED FARUC - WINTER 2014 EMS WEEK 6

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: HUNGRY BAYTALUKE on 28-JAN-15	14.00						
Matrix: WATER	11.00						
Miscellaneous Parameters							
Biochemical Oxygen Demand	103		2.0	mg/L		29-JAN-15	R3142461
Total Suspended Solids	158	DLM	15	mg/L		01-FEB-15	R3142169
рН	8.10		0.10	pН		29-JAN-15	R3141161
L1572425-2 WWTP EFFLUENT							
Sampled By: HUNGRY BAYTALUKE on 28-JAN-15 @	14:15						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-JAN-15	R3141260
Biochemical Oxygen Demand	<2.0		2.0	mg/L		29-JAN-15	R3142461
Chemical Oxygen Demand	<10		10	mg/L		02-FEB-15	R3142220
Orthophosphate-Dissolved (as P)	0.110		0.0050	mg/L		30-JAN-15	R3141202
Coliform Bacteria - Fecal	<1		1	CFU/100mL		29-JAN-15	R3141422
Phosphorus (P)-Total	0.137	DLA	0.010	mg/L		03-FEB-15	R3142726
Total Suspended Solids	<3.0		3.0	mg/L		01-FEB-15	R3142169
	8.14		0.10	рН		29-JAN-15	R3141161
NO2, NO3 and Sum of NO2/NO3							
Nitrate in water by iC Nitrate (as N)	22.1		0 020	ma/l		29-JAN-15	R3142497
Nitrate+Nitrite	22.1		0.020	1119/2		20 0/ 11 10	110142407
Nitrate and Nitrite (as N)	22.1		0.050	mg/L		03-FEB-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		29-JAN-15	R3142497
L1572425-3 ELK RIVER UPSTREAM							
Sampled By: HUNGRY BAYTALUKE on 28-JAN-15 @	14:30						
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-JAN-15	R3141260
Orthophosphate-Dissolved (as P)	0.0074		0.0050	mg/L		30-JAN-15	R3141202
Coliform Bacteria - Fecal	1	OCR	1	CFU/100mL		29-JAN-15	R3141422
Phosphorus (P)- I otal	0.0173		0.0050	mg/L		03-FEB-15	R3142726
l otal Suspended Solids	<3.0		3.0	mg/L		01-FEB-15	R3142169
µ⊓ NO2_NO3 and Sum of NO2/NO3	8.41		0.10	рн		29-JAN-15	K3141161
Nitrate in Water by IC							
Nitrate (as N)	1.32		0.020	mg/L		29-JAN-15	R3142497
Nitrate+Nitrite				-			
Nitrate and Nitrite (as N)	1.32		0.050	mg/L		03-FEB-15	
Nitrite in Water by IC			0.010			00 1451 15	D011010-
Nitrite (as N)	<0.010		0.010	mg/L		29-JAN-15	R3142497
L15/2425-4 ELK RIVER OUTFALL	44.45						
Sampled By: HUNGRY BAYTALUKE on 28-JAN-15 @	14:45						
Matrix: WATER							
Ammonia Total (25 N)	~0.050		0.050	ma/l		30- 10 1 15	D3141060
$\frac{1}{2}$			0.050	mg/L		30-JAN 15	D2141200
Coliform Bacteria - Fecal	1	OCR	0.0050	CELI/100ml		20-JAN-13	D3141202
Phosphorus (P)-Total	0.0133			ma/l		03_FER_15	R31/10706
Total Suspended Solids	<20		3.0	mg/L		01-FFR-15	R3142160
	-0.0		0.0				

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1572425-4 ELK RIVER OUTFALL							
Sampled By: HUNGRY BAYTALUKE on 28-JAN-15 @	14:45						
Matrix: WATER							
pH	8.40		0.10	рН		29-JAN-15	R3141161
NO2, NO3 and Sum of NO2/NO3 Nitrate in Water by IC							
Nitrate (as N)	0.320		0.020	mg/L		29-JAN-15	R3142497
Nitrate+Nitrite	0.220		0.050	ma/l		03 EEP 15	
Nitrite in Water by IC	0.320		0.050	iiig/L		03-1 LD-13	
Nitrite (as N)	<0.010		0.010	mg/L		29-JAN-15	R3142497
L1572425-5 ELK RIVER DOWNSTREAM							
Sampled By: HUNGRY BAYTALUKE on 28-JAN-15 @	15:00						
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-JAN-15	R3141260
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		30-JAN-15	R3141202
Coliform Bacteria - Fecal	<1		1	CFU/100mL		29-JAN-15	R3141422
Total Suspended Solids	0.0068		0.0050	mg/L		03-FEB-15	R3142726
pH	8 47		0.10	nig/∟ nH		29-JAN-15	R3141161
NO2, NO3 and Sum of NO2/NO3			0110	P			
Nitrate in Water by IC	4.50					00 1001 45	D0110107
Nitrate (as N)	1.59		0.020	mg/L		29-JAN-15	R3142497
Nitrate and Nitrite (as N)	1.59		0.050	mg/L		03-FEB-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		29-JAN-15	R3142497

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
OCR	Parameter is out of client specific range.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is carried or oxygen demand (BOD) a dissolved oxygen meter. BOD (CBOD) is determin	ut using proc re determine Dissolved BC ed by adding	edures adapted from APHA Method 5210B - "Bid d by diluting and incubating a sample for a speci DD (SOLUBLE) is determined by filtering the sam a nitrification inhibitor to the diluted sample prior	ochemical Oxygen Demand (BOD)". All forms of biochemical fied time period, and measuring the oxygen depletion using a nple through a glass fibre filter prior to dilution. Carbonaceous r to incubation.
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D-Micro Colorimetry
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is carried of Coliform bacteria is enum involves an initial 24 hour bacteria (Fecal) and is us	ut using proce nerated by cu r incubation a sed for non-tu	edures adapted from APHA Method 9222 "Memb Ituring and colony counting. A known sample vol t 44.5 degrees C of the filter with the appropriate rbid water with a low background bacteria level.	orane Filter Technique for Members of the Coliform Group". lume 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
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
Ammonia is determined u sample.	ising the Phe	nate colorimetric method. Result includes both i	ionized (NH4+) and un-ionized (NH3) ammonia present in the
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 det	ection.
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 det	ection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried or persulphate digestion of t	ut using proc the sample.	edures adapted from APHA Method 4500-P "Pho	osphorus". Total Phosphorus is determined colourimetrically afte
PH-CL	Water	рН	APHA 4500 H-Electrode
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried or colourimetrically on a sar	ut using proc nple that has	edures adapted from APHA Method 4500-P "Pho been lab or field filtered through a 0.45 micron n	osphorus". Dissolved Orthophosphate is determined nembrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is carried or (TSS) are determined by	ut using proc filtering a sai	edures adapted from APHA Method 2540 "Solids mple through a glass fibre filter, and by drying the	s". Solids are determined gravimetrically. Total suspended solids e filter at 104 deg. C.
* ALS test methods may i	ncorporate m	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**
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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 Trius Fort St. John BC, Box 25 Grand Prairie AB, 9595 -Fort McMurray AB, Bay 1 Edmonton AB, 9936 - 67 Calgary AB, Bay 7, 1313 Saskatoon SK, 819 - 58th



Fax: 604-253-6700

7 ax; 780-513-2191

x: 780-437-2311 878 Fax: 403-291-0298 Fax: 306-668-8383

CHAIN OF CUSTODY FORM

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		CERTIFIC	ATE C	DF I N	ISURANCE						
BROKER Toole Peet & Co. Limited P.O. Box 4650 Station C 1135 - 17 th 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					
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COMMERCIAL GENERAL LIABILITY	Α	81229768	3/30/2	2016	3/30/2017	EACH OCCURRENCE	\$ 2,000,0	000			
						GENERAL AGGREGATE	\$ 5,000,0	000			
PRODUCTS AND / OR COMPLETED OPERATIONS						PRODUCTS - Comp/Ops Agg.	\$ 2,000,0	000			
EMPLOYERS' LIABILITY						PERSONAL INJURY	\$ 2,000,0	000			
CROSS LIABILITY						TENANT'S LEGAL LIABILITY	\$ 250,0 \$ 10 (000			
✓ NON-OWNED AUTOMOBILES						NON-OWNED AUTO	\$ 2,000,0	000			
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						LIABILITY EXTENSION	\$				
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Jescribed Automobiles	Α	6141184202	9/18/2	2015	9/18/2016	DAMAGE COMBINED	\$ 2,000,0	000			
ALL OWNED AUTOMOBILES						BODILY INJURY (Per Person)	\$				
LEASED AUTOMOBILES						BODILY INJURY (Per Accident)	\$				
**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)							\$				
PROFESSIONAL - ERRORS & OMISSIONS LIABILITY (Claims Made)	с	SRD450628	4/20/2	2016	4/20/2017	Per Loss Limit	\$ 2,000,0	000			
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Marguerite (Dee) Biederm	nan,	Account Mana	ger	Toole Pe	eet & Co. Limited	March 18, 2016					

EXPERIENCE OVERVIEW

ENVIRONMENTAL & CONTAMINATED LAND SITE ASSESSMENTS

- Pre-purchase Assessments
- Phase I, II and III Environmental Site Assessments for Commercial, Industrial, Residential and Oil & Gas Properties
- Site Specific Guideline Re-calculation
- Statistical Trend Analysis
- Conceptual Site Model Development
- Contact with Regulatory Agencies
- Soils, Surface Water, Groundwater, Snow and Sludge Sampling & Testing

RISK MANAGEMENT AND MITIGATION

- **Risk Management Plans**
- **Risk Management Implementation**
- **Environmental Mitigation Strategies**
- Exposure Control
- Natural Attenuation

REMEDIATION

- Soil & Groundwater Remediation Evaluation & Method Selection
 - ✓ In-situ Remediation (Vapour Extraction, Bioremediation, Oxygen Introduction, Groundwater Pump and Treat)
 - On-site (Landfarming, Bio-piling, Alluing/Aeration)
 Source Removal and Off-site Disposal
 Site Specific and Innovative Techniques
- **Tender Documents Preparation**
- Comprehensive Remediation Management and/or Supervision
- Experience with Numerous Contaminants: Salt, Hydrocarbons, Chlorinated Solvents, PAHs, Fertilizers, Herbicides/Pesticides, Heavy Metals, Disulfides and others
- Underground Storage Tanks Removals
- Post Remediation Monitoring & Evaluation

SOIL VAPOUR SURVEYS & EVALUATION

- Soil Vapour Assessments
- Soil Vapour Probe Sampling
- Soil Vapour Criteria Derivation
- **Risk Management and Remediation**
- Conceptual Site Model
- . Experience with Various Parameters: Methane, Hydrocarbons, Solvents, etc.

INDOOR AIR QUALITY ASSESSMENT

- Indoor Air Sampling and Testing
- Sub-slab Air Sampling and Testing
- Pollutant Source Assessment and Problem Identification
- Air Quality Improvements
- Experience with Hydrocarbons, Chlorinated Compounds, Dust, Metals, Mould

HAZARDOUS BUILDING MATERIAL ASSESSMENT

- Indoor Air Sampling and Testing for Hazardous Materials: Asbestos, Lead, Arsenic, Mercury, UFFI, PCBs, Silica, Radioactive Materials, ODS
- Mould Testing
- Radon Testing and Mitigation

EXPERIENCE OVERVIEW - continued

REGULATORY COMPLIANCE FOR FACILITIES (under AER and AEP)

- Site Assessments (Phase I & II ESA, Contamination Delineation)
- **Risk Management Plans**
- Standard Operating Procedures Development & Process Optimization
- Liability Assessments including Site Specific
- **Decommissioning Plans** .
- Site Remediation & Monitoring
- Contact with Regulatory Agencies
- Assistance with Regulatory Approvals

ENGINEERING – WATER, WASTEWATER & CONTAMINATED WATER

- Water & Wastewater Systems Evaluation
- Annual Compliance Reports
- Wastewater Irrigation Reports .
- Environmental Emergency Plans for WTP .
- Water Source Evaluation
- Well Pumping/Flow Tests and Evaluation .
- Feasibility Studies
- Chemical and Microbial Sampling and Testing
- Soil Evaluation for Septic Fields
- Full Contaminated Water Remediation System Design and Treatment
- Pilot Water Testing (DAF, Media Filters, Membrane Filtration, Biological Activated Filter, and others)
- Design/Built Potable Water, Process Water and Contaminated Water Packages

COMPLIANCE TESTING & MONITORING

- Long Term Compliance Testing and Monitoring such as:

 - Water Distribution Systems
 Water & Wastewater Treatment Plants Compliance Reports
 - ✓ Wastewater Irrigation Reports
 - ✓ Landfill Monitoring
 - ✓ Fuel Tank Sites Monitoring
 - ✓ Lead in Water Sampling

 - Surface Water Sampling
 Snow & Snow Storage Sampling
- Various clients
 - ✓ Municipalities
 - ✓ Various Developments
 - ✓ Golf Courses
 - ✓ Resorts
 - ✓ Facilities

CORE PERSONNEL

Jana Zverina, P.Eng. (M.Sc. in Water Resources Engineering & Management and Diploma in Civil Engineering)

Manager of Environmental Engineering & Operations (Principal)

Jana has been working as a water resources and environmental engineer for more than 30 years. The following is the pertinent experience:

- ✓ Five years of process design, equipment selection, evaluation, pricing of industrial and municipal water & wastewater treatment, industrial water remediation including floatation sediment storage & transportation and mine rehabilitation work, environmental remediation including natural attenuation and containment for deep coal mines as a junior engineer
- ✓ Twenty five years as an environmental engineer including:
 - Engineering and project management
 - Thousands of environmental site assessments for oil & gas facilities, commercial and industrial sites & multi-residential site
 - Hundreds of Remediation and Risk Management Plans for various projects such as oil & gas leases, batteries, gas plants, underground and aboveground storage tanks sites, chemical storage sites, sites on and adjacent to landfills, CPR yards, chemical storage sites, dry-cleaning and other facilities
 - Specifications, budget proposals, cost estimates for hundreds of site abandonments projects including equipment dismantling, disposal, re-use, recycling
 - Remediation and risk management options for a number of soil and groundwater treatment methods including off-site disposal and treatment, in-situ treatments ie land treatment, bio-piling, enhanced bio-remediation, chemical in-situ treatment, chemical oxidation and reduction, vapour extraction, pump and treat, etc. as well as other site specific treatment methods
 - Numerous soil and groundwater remediation projects employing various remediation methods for salt, hydrocarbons, solvents, fertilizers, herbicides/pesticides, heavy metals and others
 - o Completed numerous remediation projects within the proposed budget cost

Irina Sabau, P.Ag. (B.Sc. In Environmental Sciences) Environmental Project Manager (Principal)

Irina has been working as an environmental scientist for over 8 years. The following is the pertinent experience:

- ✓ One year of analytical environmental laboratory experience
- Seven years as an environmental scientist including:
 - Hundreds of environmental site assessments, indoor air evaluations, soil vapour evaluations, snow assessment, mitigation plans, exposure control plans, hazardous materials assessments, methane gas studies, remediation and risk management plans for various projects
 - Specifications, budget proposals, cost estimates for assessment
 - Remediation and risk management options for a number of soil and groundwater treatment methods including off-site disposal and treatment, in-situ treatments ie land treatment, bio-piling, enhanced bio-remediation, chemical in-situ treatment, chemical oxidation and reduction, vapour extraction, pump and treat, etc. as well as other site specific treatment methods
 - Numerous soil and groundwater remediation projects employing various remediation methods for salt, hydrocarbons, chlorinated solvents, fertilizers, heavy metals, disulfides, and others
 - o Completed numerous remediation projects within the proposed budget cost

Kim Harvey, P.Chem (B.Sc. in Chemical Science) Environmental Consultant

Kim has been working as an environmental consultant for over 10 years. The following is the pertinent experience:

- ✓ Four years of analytical environmental laboratory experience
- ✓ Ten years as an environmental consultant including:
 - Hundreds of environmental site assessments, mitigation plans, risk management plans, soil and groundwater monitoring programs, reclamation and remediation assessments
 - o Specifications, budget proposals, cost estimates for assessment

Naomi Anton, A.T.T. (B.Sc. in Environmental Management, Diploma in Environmental Technology)

Environmental Consultant

Naomi has been working as an environmental consultant for over 6 years. The following is the pertinent experience:

✓ Six years as an environmental consultant including:

- Numerous environmental site assessments, soil and groundwater monitoring programs, remediation supervision, hazardous materials assessment, indoor air and soil vapour sampling
- o Potable, surface and groundwater sampling

Penny Currie, (B. ASc. Diploma in Environmental Management) Environmental Consultant

Penny has been working as an environmental consultant for over 5 years. The following is the pertinent experience:

✓ Five years as an environmental consultant including:

- Numerous environmental site assessments, soil and groundwater monitoring programs, hazardous materials assessment
- Potable, surface and groundwater sampling

Desarae Ahlstrom, (Diploma in Environmental Technology) Environmental Technologist/Water Sampler

Water sampling and testing, analytical laboratory experience

Lisa Columbus

Office Manager

• Over 20 years of experience with office management, work and personnel organization, bookkeeping and payroll

Corinne Coy

Administrative Assistant

 Over 5 years office experience, customer service and processing orders, assistance with water and soil sampling, sample processing and preparation for shipping, record searches, administrative part of environmental site assessments
Contract Work

Milan Zverina, P.Eng. (M.Sc. in Water/Wastewater Treatment & Water Resources) Project Manager

 over 35 years of experience in feasibility studies, municipal and industrial water & wastewater systems evaluations, water & wastewater treatment, process equipment & package design, manufacture and start up, design and management of the construction of equipment and pipelines for oil & gas industry, the projects he participated in include numerous plants & equipment in Eastern Europe, Asia, Africa, Canada and US

Lukas Fikr, P.Geol. (M.Sc. in Geology) Senior Geologist/Hydrogeologist

 Over 15 years of environmental, geological and hydrogeological experience including exploration, drilling supervision, interpretation of geological, hydrogeological and environmental data, processing of geological parts of risk and hazard assessments and environmental audits

S. Tolga Olcay, M.Sc., P.Eng. (B.Sc. in Environmental Engineering, M.Sc. in Environmental Sciences)

Planned, implemented and reported ambient air quality and meteorological monitoring studies in Alberta, BC and NWT (Set-up monitoring units at site, maintenance and calibration, data collection, data processing, compliance reporting) for mining industry. extensive experience as air dispersion modeler (by using calpuff and aermod) for EIA projects for oil & gas industry, numerous oil sands projects and mining industries, conducted training sessions for new staff about environmental issues, ambient air quality and indoor air quality monitoring and reporting., accomplished indoor air quality studies for residential buildings, office buildings and industrial buildings. (Generic pollutants, mold, toxic gases...), performed periodical maintenance of monitoring analyzers and calibration devices, developed technical calibration procedures for electrochemical sensors for ambient air.

RECENT PROJECTS

The list of projects, clients and references can be provided on request.

Environmental Diagnostics Inc. has undertook thousands of Phase I, II and III Environmental Site Assessments, contamination delineations and contamination remediation projects in Southern and Central Alberta, British Columbia and Saskatchewan as well as numerous hazardous materials surveys, indoor/sub-slab and soil-vapour sampling and evaluations.

EDI also undertook numerous pump/flow tests and chemical tests as well as water well and water supply/treatment system evaluations and compliance report preparations.

Example of some of the EDI long-term clients:

City of Calgary

- Potable water sampling for the City of Calgary
- Storm water pond sampling
- Lead in water distribution system sampling
- Snow and meltwater sampling

City of Airdrie

- Landfill monitoring
- Fleet yard tank nest monitoring

Oil & Gas Midstream and Upstream Clients

Land Developers

- Ronmor Developers Inc.
- Harmin Holdings Ltd.
- MDC Properties Ltd.
- Certus Development Ltd.
- United Communities
- Qualico Development

Resorts and Golf Courses

- The Lake Louise Ski Resort
- Resort of the Canadian Rockies Inc.
- Priddis Greens Services Co-op Limited
- Azuridge Boutique Hotel
- Johnson Canyon Resort

Various

- Alsa Paving
- Freeze Maxwell Roofing Ltd.
- Calgary Metals
- NAI Advent
- Gas Plus
- Numerous commercial and industrial clients transactional assessments & remediation work

EDI is on the list of all major banks and financial institutions such as Business Development Bank, Royal Bank of Canada, CIBC, Bank of Montreal and others.