



2015 SEWAGE TREATMENT PLANT ANNUAL REPORT

Prepared for:

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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 phosphours were above the MSR discharge limits. FARUC began a monitoring and Clearpac dosing investigation in the winter of 2007 to reduce effluent phosphorous concentrations. The reduction program has shown significant improvement of phosphorus levels in plant effluent. This work will continue 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:

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

2.2 REGISTRATION LETTER OPERATING CONDITIONS

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

Table 1
 Effluent Limits

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

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

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

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

2.3 REPORTING REQUIREMENTS

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



In addition the report must also include the following:

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

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

2.4 SAMPLING FREQUENCY

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

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

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

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

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

Table 2
 Sampling Location/Frequency/Type

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



Where:

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



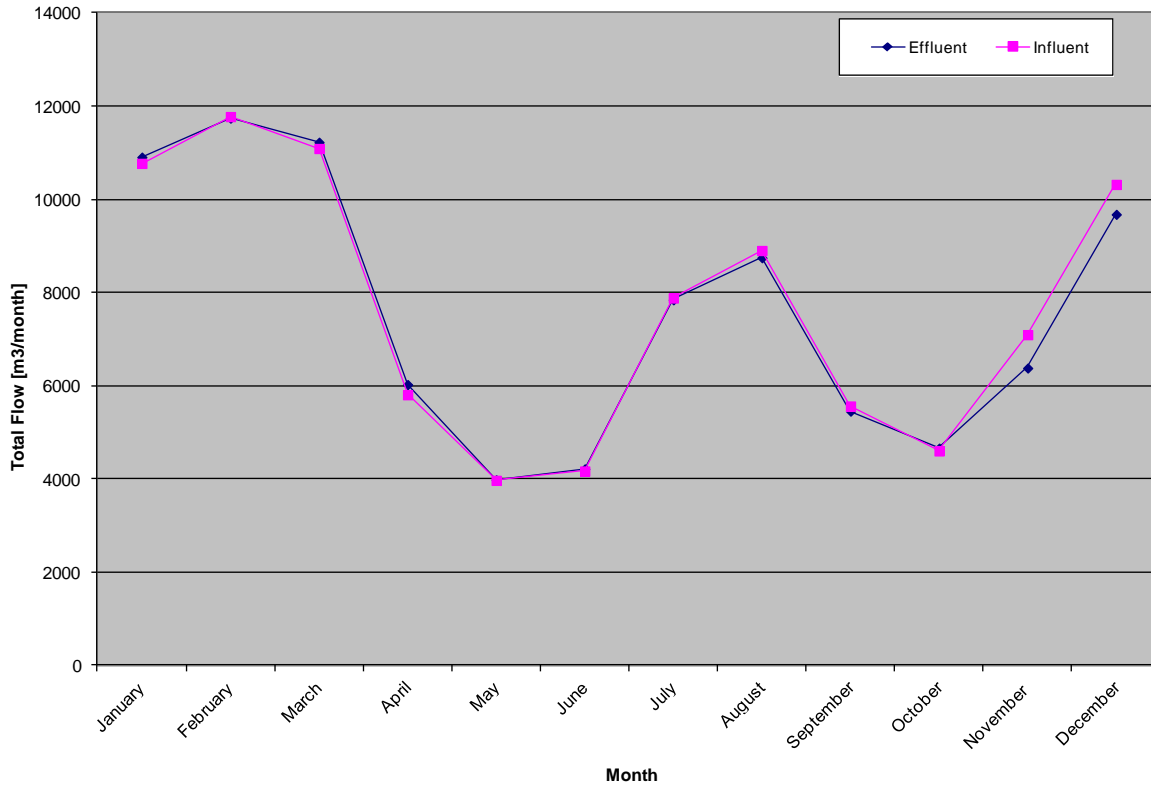
3.0 SEWAGE FLOW RECORDS

This section provides data and analysis regarding 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.



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

Table 3

2003 – 2015 Flow Comparisons

Year	Sewage Flow (m ³ /day)			Days Over Limit
	Total	Average	Peak	
2003	137,035	375	1,244	0
2004	151,815	414	1,307	1
2005	125,699	344	1,293	1
2006	127,202	348	1,058	0
2007	144,480	396	1,177	0
2008	135,767	372	873	0
2009	113,336	311	1,178	0
2010	104,815	287	823	0
2011	90,213* (122,275) ¹	335	989 ²	0
2012	62,509** (122,610) ¹	335	811 ²	0
2013	121,982	335	1,181	0
2014	125,437	344	1,036	0
2015	90,931	250	1,058	0

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

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

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

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

2004 to 2012

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

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

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

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

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

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



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

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

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

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

2013 to 2015

The average flow for 2015 has decreased slightly since 2013 at 250 m³/day and there are no instances where the flow exceeded the 1,280 m³/day. The peak flow has increased slightly compared to 2014 (1,036 m³/day vs 1,058 m³/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.

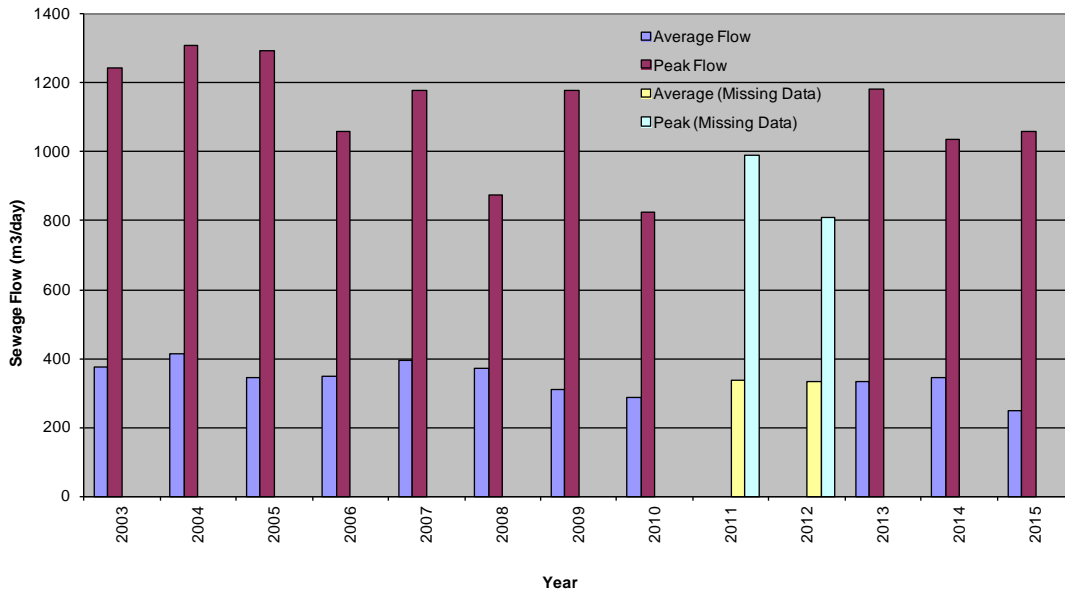
As seen in previous years, the highest peak flow was in February; high peak flows also occurred systematically in January, March and December, which is consistent with the facility operations. The highest month in 2015 for average flows was in February, in which the peak flow was also observed.

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

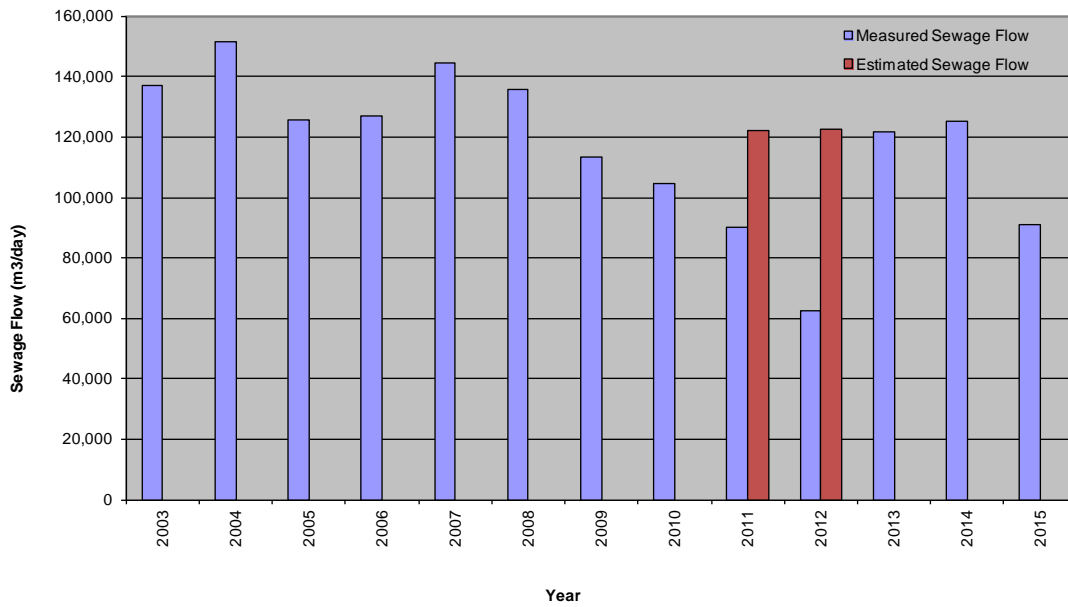
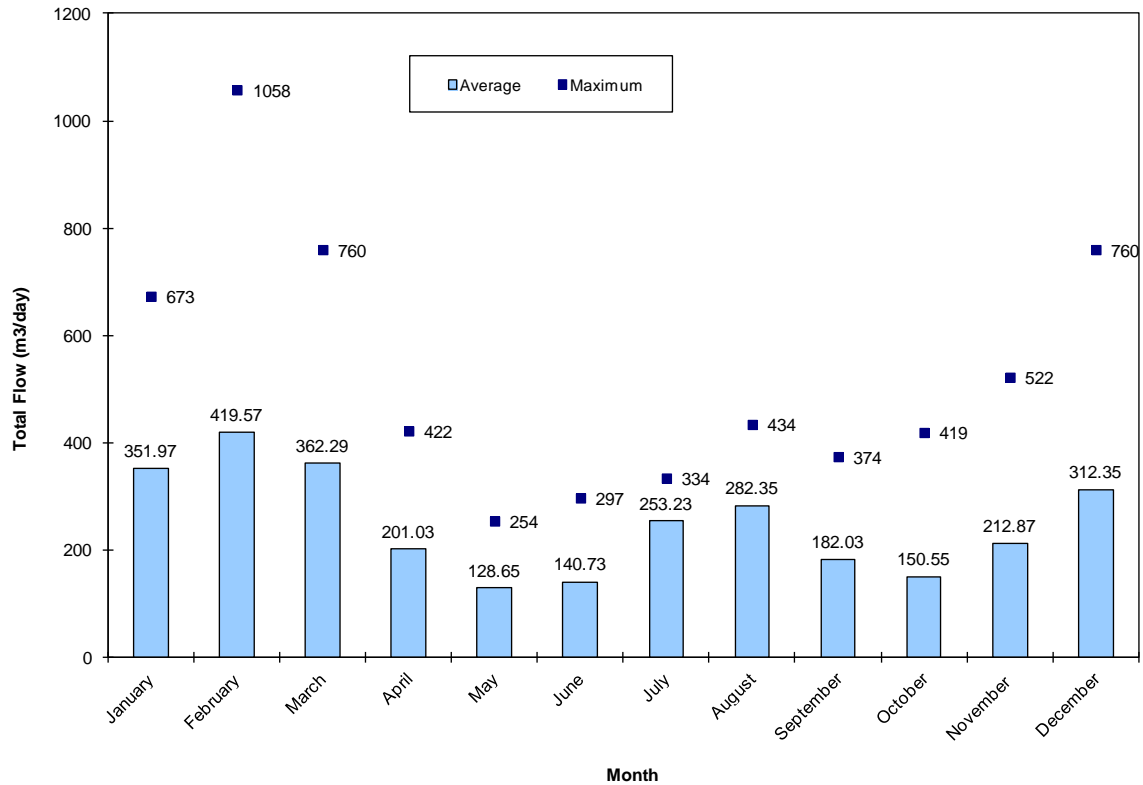


Figure 4
 2015 Sewage Effluent Average and Peak Flows by Month

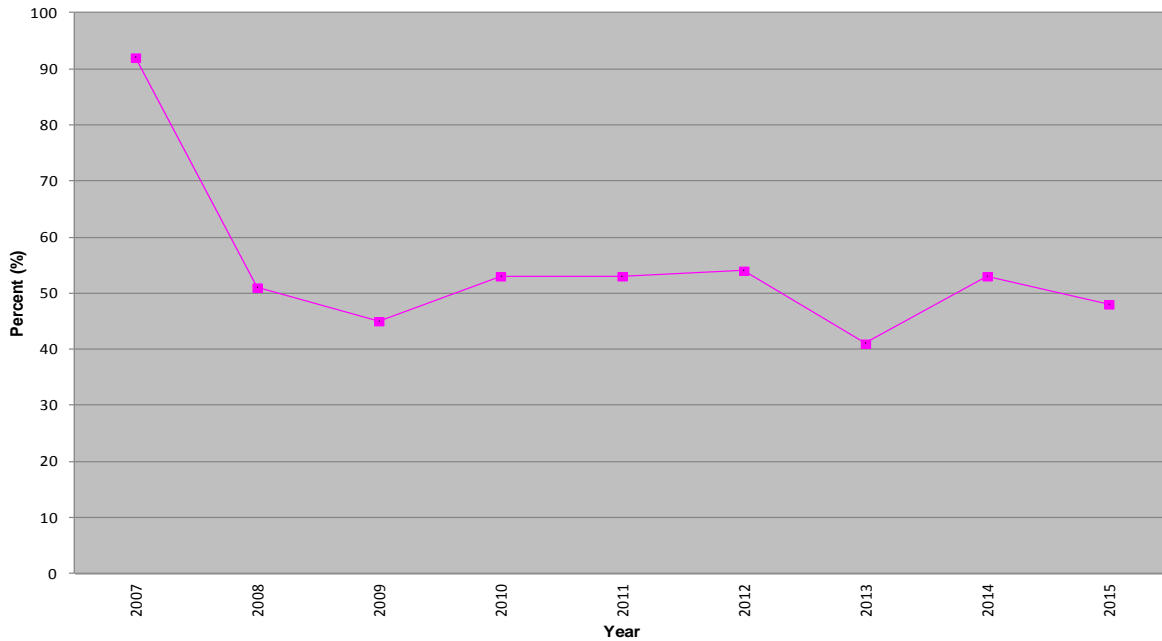


The Resort's ongoing program to reduce sewer infiltration is demonstrated by the reduction in return flow to the plant vs. total water usage. In 2007 the total sewage flow was equal to 92% of the total water production; in 2008 this figure decreased to 51% and in 2009, this figure decreased even further 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.

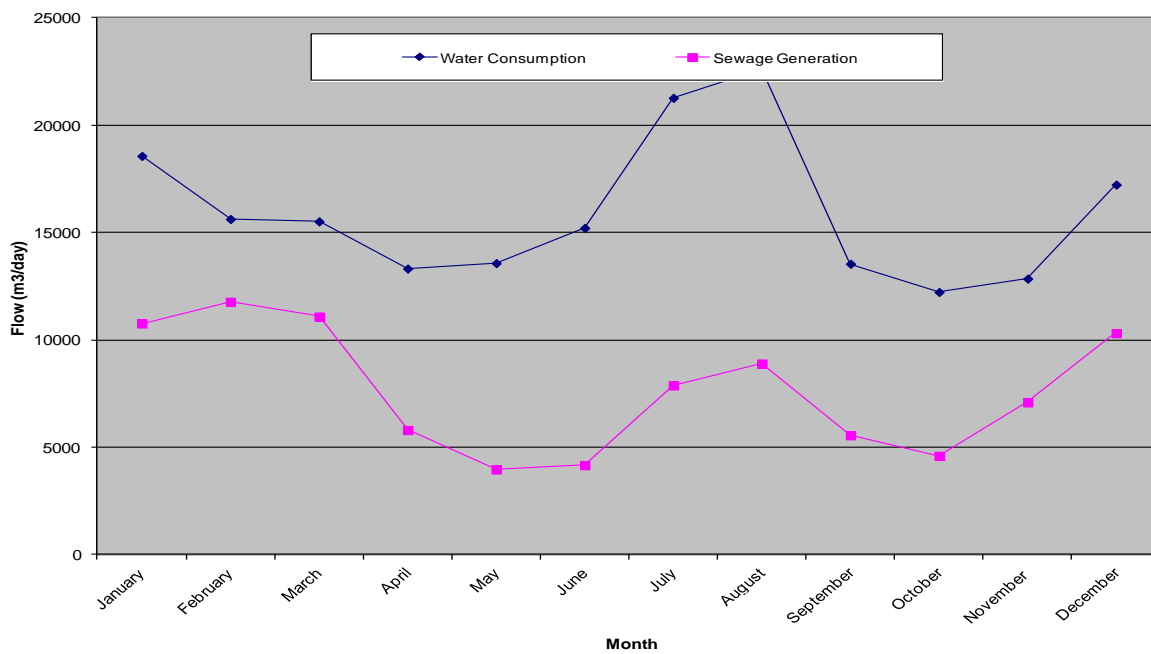


Figure 5
 Percent Sewage Flow vs Water Production



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 m³/day. Using the actual peak flow of 811 m³/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.

Table 4
 Projected Peak Flows: 2007-2016

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

	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 factor for 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015 and correction factor

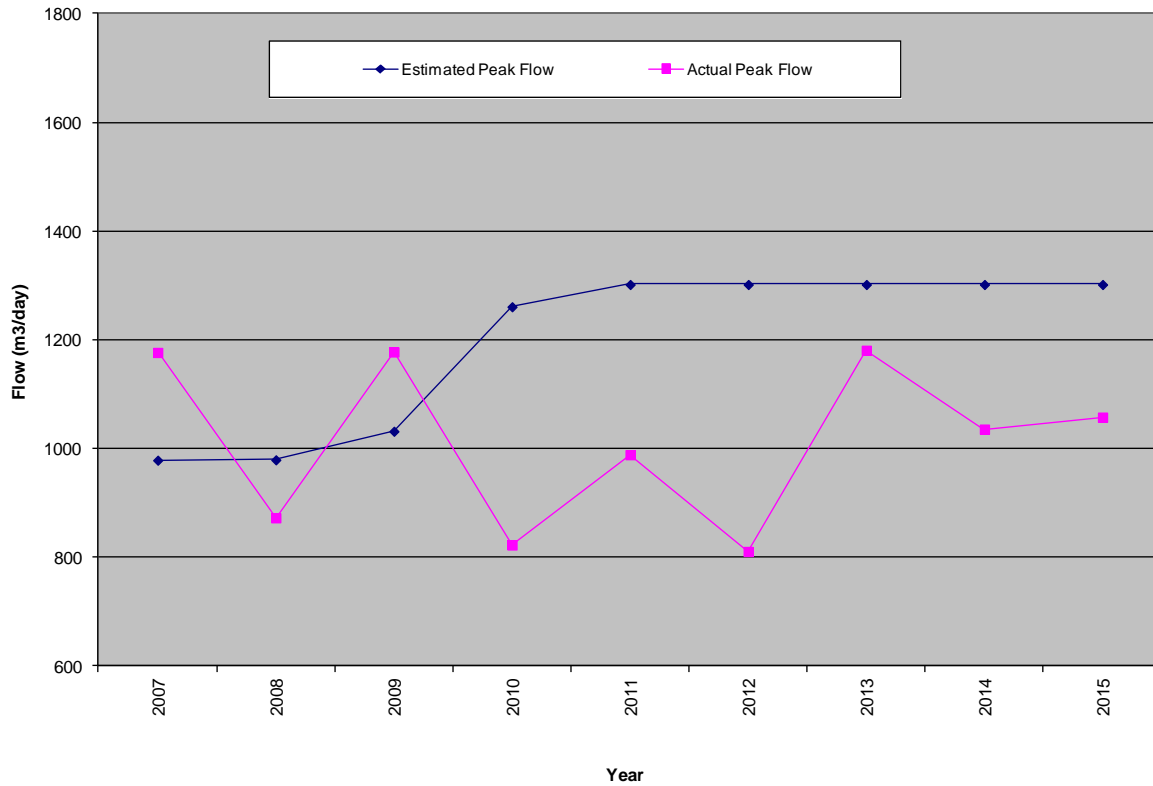
2007	correction factor of	1177/979.2	= 1.20
2008	"	873/979.9	= 0.89
2009		1178/1032.4	= 1.14
2010		823/1261.4	= 0.65
2011		989/1302.3	= 0.76
2012		811*/1302.3	= 0.62
2013		1181/1302.3	= 0.91
2014		1036/1302.3	= 0.80
2015		1058/1302.3	= 0.81

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.

Figure 7
 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 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.



Table 5
 2015 Elk River Sample Results

Sample Date (yyyy-mm-dd)	NH ₃			Ortho-P			Coliform			Total P mg/L		
	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 (yyyy-mm-dd)	TSS			pH			N-NO ₃			N-NO ₂		
	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN	UP	IDZ	DN
2015-01-01	3.0	3.0	3.0	8.37	8.24	8.39	1.35	13.00	1.47	0.01	0.01	0.01
2015-01-07	3.0	3.0	3.0	8.43	8.35	8.47	1.80	4.75	1.80	0.01	0.01	0.01
2015-01-14	-	3.0	3.3	-	8.23	8.38	-	5.14	0.79	-	0.01	0.01
2015-01-21	3.3	3.0	3.0	8.44	8.34	8.47	1.91	4.42	1.94	0.01	0.01	0.01
2015-01-28	3.0	3.0	3.0	8.41	8.40	8.47	1.32	0.32	1.59	0.01	0.01	0.01
2015-04-29	4.7	7.3	9.3	8.36	8.48	8.49	1.12	0.94	1.31	0.01	0.01	0.01
2015-05-07	11.3	10.0	11.3	8.45	8.45	8.46	1.43	1.30	1.49	0.01	0.01	0.01
2015-05-13	3.0	3.0	3.0	8.40	8.41	8.46	1.45	1.31	1.54	0.01	0.01	0.01
2015-05-21	9.3	12.0	16.0	8.32	8.36	8.37	1.33	1.32	1.40	0.01	0.01	0.01
2015-05-28	72.0	89.3	96.0	8.24	8.27	8.28	1.03	1.03	1.05	0.01	0.01	0.01
2015-06-11	22.0	24.7	20.7	8.35	8.39	8.40	1.10	1.11	1.14	0.01	0.01	0.01
2015-10-01	3.0	3.0	3.0	8.24	8.31	8.33	2.11	2.14	2.14	0.01	0.01	0.01
2015-10-08	3.0	3.0	3.3	8.01	8.15	8.33	2.25	2.28	2.28	0.01	0.01	0.01
2015-10-15	3.0	3.0	3.0	8.25	8.17	8.28	2.12	2.15	2.15	0.01	0.01	0.01
2015-10-22	3.0	3.0	3.0	8.23	8.25	8.25	2.09	2.17	2.18	0.01	0.01	0.01
2015-10-28	3.0	3.0	3.0	8.15	7.88	8.13	2.21	2.22	2.30	0.01	0.01	0.01
2015-11-05	3.0	3.0	3.0	8.15	8.25	8.20	1.72	1.52	1.98	0.01	0.01	0.01
2015-12-22	3.0	3.0	3.0	8.31	8.27	8.33	1.89	1.68	2.00	0.01	0.01	0.01
# Samples	17	18	18	17	18	18	17	18	18	17	18	18
Average	9.2	10.1	10.7	8.30	8.29	8.36	1.66	2.71	1.70	0.01	0.01	0.01
Maximum	72.0	89.3	96.0	8.45	8.48	8.49	2.25	13.00	2.30	0.01	0.01	0.01
Minimum	3.0	3.0	3.0	8.01	7.88	8.13	1.03	0.32	0.79	0.01	0.01	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.

Table 6
 2015 Influent Results

Date (yyyy/mm/dd)	2015 Influent Results Summary					
	Flow m ³ /d	Temp C	pH	TSS mg/L	BOD mg/L	COD 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

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.

Table 7
2015 Effluent Results

Date (yyyy/mm/dd)	2015 Effluent Results Summary											
	Flow m ³ /d	Temp C	NH ₃ -N mg/L	BOD mg/L	COD mg/L	P-OP04 mg/L	Coliforms cfu/100ml	Total P mg/L	TSS mg/L	pH	NO ₃ -N mg/L	NO ₂ -N 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

- 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 8th) 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 8th 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.

Table 8
Toxicity Test Results

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

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.

Table 9
 2015 MSR Parameter Compliance

Parameter	Unit	MSR Limit	No. of Samples	Average Value	Max. Value	Samples Over Limit
Flow	m ³ /day	1280	365	250	1,058	0
BOD ₅	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 LC ₅₀ Bioassay	/	Non-toxic	3.0	/	/	0

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

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 down-stream (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 bio-solids without resorting to vacuum truck services. All solids were transported to the Crowsnest/Pincher Creek Landfill site.

Hauling data for bagged solids are in Table 10.

Table 10
2015 Bagged Solids Data

Month	Vol. Bagged (m ³)
January	207.20
February	190.80
March	177.40
April	140.00
May	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

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 through the aeration basins, the overflow of TSS also results in an increase in BOD readings due to the presence of biological floc.

There were no bypass events in 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 1st, 3% on Jan 7th and 19% on Dec 22nd.

Figure 8
 Total Phosphorus Levels 2007-2015

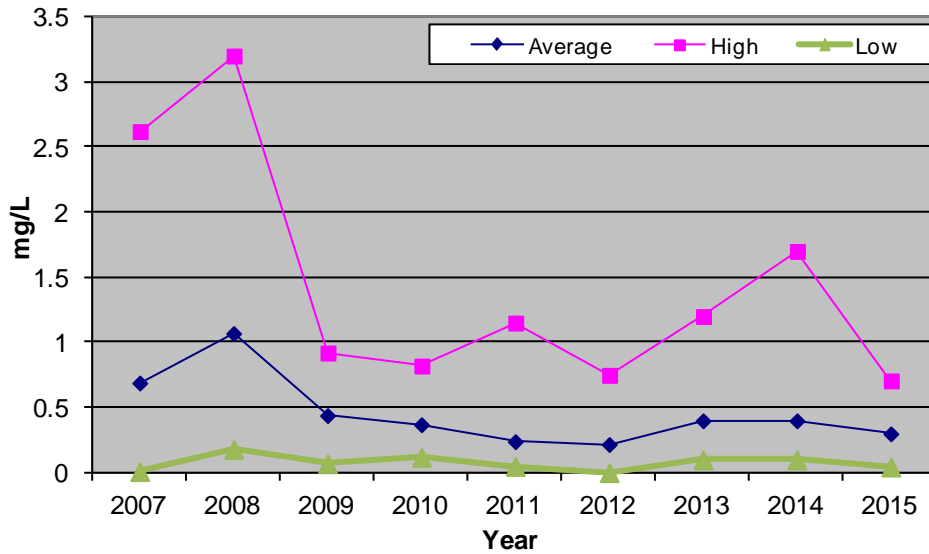


Figure 9
 Ortho Phosphorus Levels 2007-2015

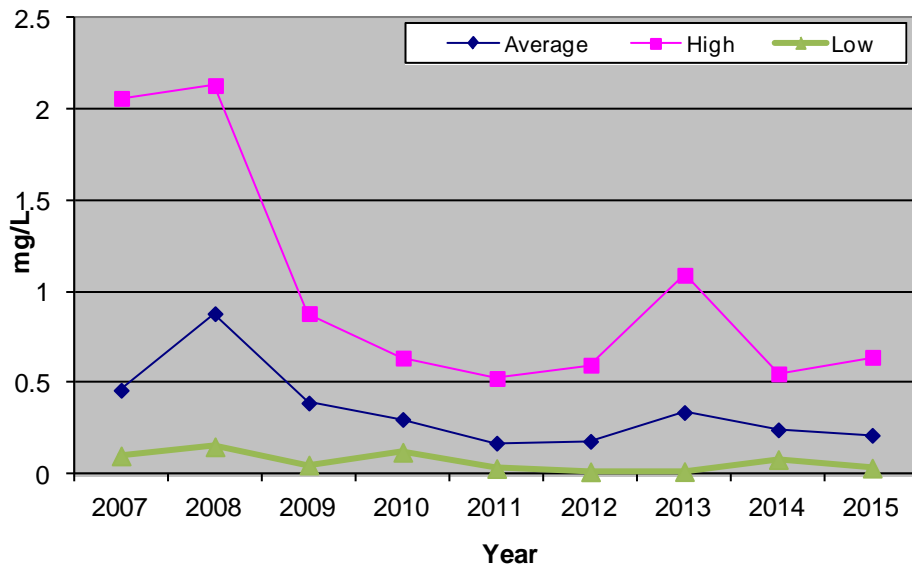
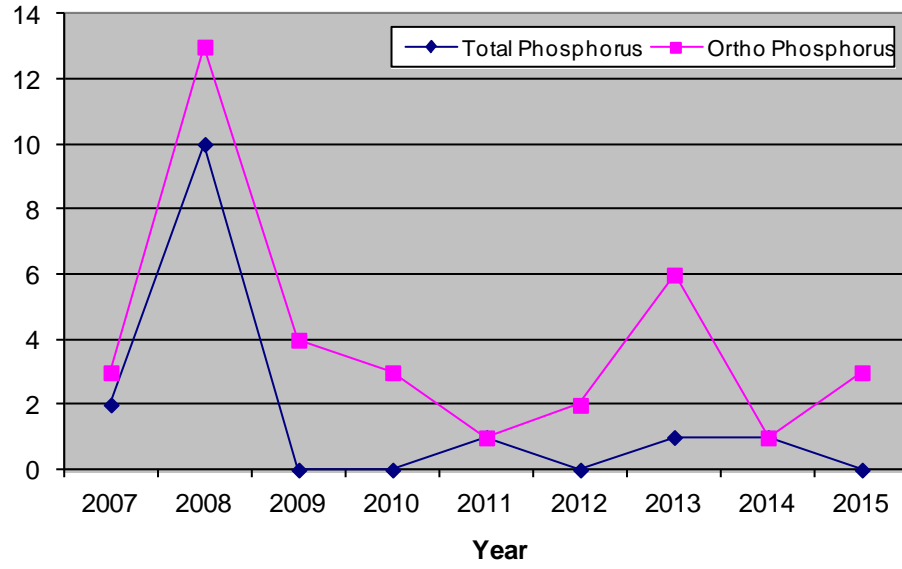


Figure 10
Days over Limit 2007-2015



12.0 ASSESSMENT SUMMARY

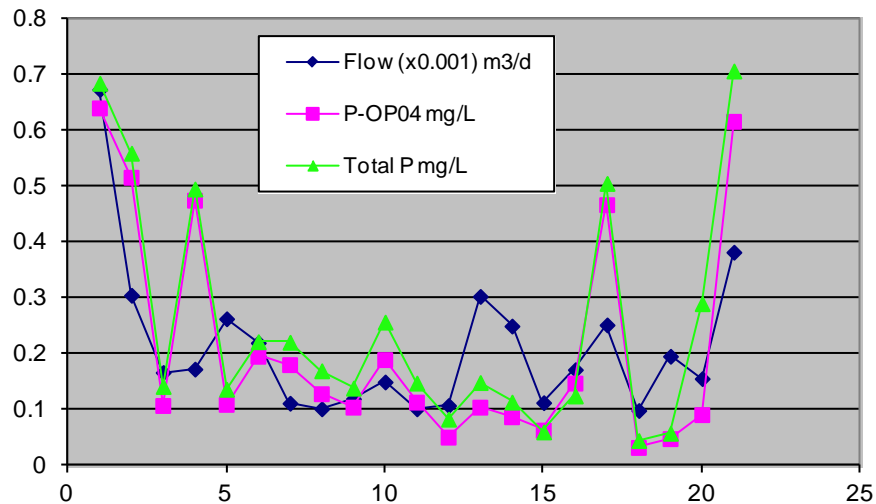
The plant has produced high quality effluent with BOD₅ normally below the regulated limit of 45 mg/l and for all but one instance, less than 2 mg/l. TSS was less than laboratory detection limit for all samples except one on Oct 8th when it was measured at 4.7 mg/L. Both TSS and BOD were below the MSR 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 down-stream (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.



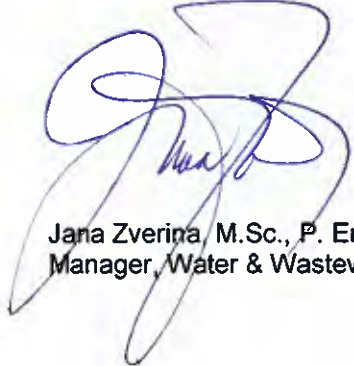
13.0 AUTHORIZATION AND CLOSING

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.



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

Existing Development	Flow* (l/unit/day)	Units	2011 Generation (m3/day)	2012 Generation (m3/day)	2013 Generation (m3/day)	2014 Generation (m3/day)	2015 Generation (m3/day)	2016 Generation (m3/day)
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 Units	Flow* (l/unit/day)	Units	2011 Generation (m3/day)	2012 Generation (m3/day)	2013 Generation (m3/day)	2014 Generation (m3/day)	2015 Generation (m3/day)	2016 Generation (m3/day)
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
Timberland Multifamily	1022	45	59.97	59.97	59.97	59.97	59.97	59.97
Timberland 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	384.59

Highline Subdivision	Flow* (l/unit/day)	Units	2011 Generation (m3/day)	2012 Generation (m3/day)	2013 Generation (m3/day)	2014 Generation (m3/day)	2015 Generation (m3/day)	2016 Generation (m3/day)
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 Users	Flow* (l/unit/day)	Population (each)	2011 Generation (m3/day)	2012 Generation (m3/day)	2013 Generation (m3/day)	2014 Generation (m3/day)	2015 Generation (m3/day)	2016 Generation (m3/day)
Skiers	36	700	252	252	252	252	252	252
Subtotal		700	252	252	252	252	252	252

Dining Facilites/Bars	Flow* (l/m ² /day)	Area (m2)	2011 Generation (m3/day)	2012 Generation (m3/day)	2013 Generation (m3/day)	2014 Generation (m3/day)	2015 Generation (m3/day)	2016 Generation (m3/day)
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	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



Date: September 30, 2002

Our File: RE 17139

REGISTERED MAIL

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

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

Dear Sir:

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

This is to acknowledge your registration form under the *Municipal Sewage Regulation* (the *Regulation*) dated August 30, 2001, and received at this office on October 31, 2001, for the registration of the wastewater treatment plant owned and operated by Resorts of the Canadian Rockies Inc. at the Fernie Alpine Resort ski hill located near Fernie, British Columbia. Pursuant to Part 2, section 3 of the *Regulation*, the effective date of registration of this discharge is the date of this letter. The ministry file number for this discharge is 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*. Fees will be calculated using a maximum effluent flow of 1280 m³/day, a maximum BOD₅ of 45 mg/L and a maximum TSS of 45 mg/L.

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

Ministry of
Water, Land and Air
Protection

Kootenay Region

Mailing/Location Address:
401 - 983 Victoria Street
Nelson BC V1L 4K9

Telephone: 250 354-8333
Facsimile: 250 354-8332
PP Facsimile: 250 354-8367

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 authorized works are adequately designed or will satisfy the *Regulation*. It is the responsibility of the discharger to ensure that the works are adequately designed, constructed and operated and that the discharge quality complies with the *Regulation* and this letter. Registration under the *Regulation* and this letter are without prejudice to any additional works that may be required or any additional requirements that may be specified by the *Manager*. The *Manager* may also issue Orders under the *Act*.

Registration under the *Regulation* does not 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 out by staff from our Sub-Regional Office located at #205 Industrial Road G, Cranbrook, British Columbia, V1C 7G5, (telephone: (250) 489-8570) or from our Regional Office located at #401 - 333 Victoria Street, Nelson, British Columbia, V1L 4K3. Plans, data and reports pertinent to the *Regulation*, registration and this letter are to be submitted to the *Manager* at the Sub-Regional office address at Cranbrook, British Columbia in the form required by the *Regulation* or in the form required by the *Manager*. The ministry uses a reference number to track monitoring data associated with discharges. The site reference number for this discharge is H102571.

Registration Reference Documents

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

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

Treatment Plant Works

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

Primary Screenings and Dewatered Biosolids (Sludge) Disposal

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

Semi-solid Waste

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

Plant Design

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

Outfall Diffuser

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

} check the flow

Operator Qualifications and Certification

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

Monitoring

The discharger shall undertake monitoring in accordance with Part 7 and applicable conditions of Schedule 6 of the *Regulation* subject to the requirements as follows:

Sampling and Analysis

Sampling and analysis shall be in accordance with Part 7, Section 25 of the *Regulation*.

Minimum detection limits for nutrients shall be:

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

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

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

Discharge Monitoring and Receiving Environment Monitoring

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

Sampling Location Frequency/Type

	Elk River 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	WS/G	M/G	M/G and WS/G and D/CON.
ammonia (as nitrogen)	WS/G		M/G and WS/G
nitrate (as nitrogen)	WS/G		M/G and WS/G
nitrite (as nitrogen)	WS/G		M/G and WS/G
total phosphorus	WS/G		M/G and WS/G
	Elk River ⁴ (At Sites UP, IDZ and DN)	Plant Influent ³	Plant Effluent ³
orthophosphate	WS/G		M/G and WS/G
fecal coliforms	WS/G		M/G and WS/G
Toxicity			3Y/G

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

Sampling Location Frequency/Type

	Elk River 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	WS/G	M/G	M/G and WS/G and D/CON.
ammonia (as nitrogen)	WS/G		M/G and WS/G
nitrate (as nitrogen)	WS/G		M/G and WS/G
nitrite (as nitrogen)	WS/G		M/G and WS/G
total phosphorus	WS/G		M/G and WS/G
	Elk River ⁴ (At Sites UP, IDZ and DN)	Plant Influent ³	Plant Effluent ³
orthophosphate	WS/G		M/G and WS/G
fecal coliforms	WS/G		M/G and WS/G
Toxicity			3Y/G

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

Sampling Frequency:

D - means daily.

M - means monthly.

WS -- weekly seasonal (This means obtaining samples weekly for a six week period in the spring, in the fall and during the Christmas season at peak flow times and days. Peak flow days will be predicted on the basis of resort bookings. The commencement of the spring and fall sampling 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.

Environmental Monitoring System (EMS) Numbers

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

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OCT - 3 2002

URBAN SYSTEMS LTD.

Monitoring Program Changes

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

Supervisory Control and Data Acquisition (SCADA)

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

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

Yours truly,



Carl Johnson, P.Eng.
Assistant Regional Waste Manager

/p

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



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 02-OCT-15
Report 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

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1682334-1 WWTP INFLUENT Sampled By: BC on 01-OCT-15 @ 15:45 Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	84	DLHC	75	mg/L		02-OCT-15	R3284877
Total Suspended Solids	32.0		3.0	mg/L		07-OCT-15	R3287095
pH	7.64		0.10	pH		09-OCT-15	R3287027
L1682334-2 WWTP EFFLUENT Sampled By: BC on 01-OCT-15 @ 16:30 Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		09-OCT-15	R3286961
Biochemical Oxygen Demand	<2.0		2.0	mg/L		02-OCT-15	R3284877
Chemical Oxygen Demand	<10		10	mg/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
pH	8.10		0.10	pH		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							
Nitrate and Nitrite (as N)	20.3		0.050	mg/L		08-OCT-15	
Nitrite in Water by IC							
Nitrite (as N)	0.018		0.010	mg/L		02-OCT-15	R3285938
L1682334-3 ELK RIVER UPSTREAM Sampled By: BC on 01-OCT-15 @ 16:20 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
pH	8.24		0.10	pH		09-OCT-15	R3287027
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	2.11		0.020	mg/L		02-OCT-15	R3285938
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	2.11		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
L1682334-4 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

* 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
L1682334-4 ELK RIVER @ OUTFALL Sampled By: BC on 01-OCT-15 @ 16:10 Matrix: WATER							
pH	8.31		0.10	pH		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							
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	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	0.0069		0.0050	mg/L		09-OCT-15	R3286727
Total Suspended Solids	<3.0		3.0	mg/L		07-OCT-15	R3287095
pH	8.33		0.10	pH		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							
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

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

Reference Information

Sample Parameter Qualifier Key:

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

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day Incub.-O2 electrode
<p>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.</p>			
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D -Closed Reflux, Colorimetric
<p>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 colorimetrically 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.</p>			
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
<p>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.</p>			
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
<p>Ammonia is determined using the Phenate colorimetric method. Result includes both ionized (NH4+) and un-ionized (NH3) ammonia present in the sample.</p>			
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p>			
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p>			
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
<p>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.</p>			
PH-CL	Water	pH	APHA 4500 H-Electrode
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
<p>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.</p>			
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
<p>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.</p>			

** 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:

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.



L1682334-COFC

SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY:		FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN:	PATRICK MAJER		ANALYSIS REQUESTED:												
ADDRESS:		1505 - 17TH AVENUE SOUTH WEST																	
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2														
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Bo Choroszewski														
PROJECT NAME AND NO.:		Ferne Alpine Resort- Fall 2015 EMS wk 1		QUOTE NO.:															
PO NO.:		ALS CONTACT:		Lyudmyla Shvats															
REPORT FORMAT:		<input checked="" type="checkbox"/> HARDCOPY		<input checked="" type="checkbox"/> EMAIL - ADDRESS:		pmaier@skircr.com													
		<input type="checkbox"/> FAX		<input type="checkbox"/> EXCEL		<input checked="" type="checkbox"/> PDF		<input type="checkbox"/> OTHER:											
WO#	SAMPLE IDENTIFICATION		DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)			
			YYYY-MM-DD	TIME															
FOR LAB USE ONLY	1	WWTP Influent Routine	2015-10-01	15:45	Water		X	X								13.3°C			
	2	WWTP Influent BOD	2015-10-01	15:45	Water									X		13.3°C			
	3	WWTP Effluent Routine	2015-10-01	16:30	Water		X	X							X	14.1°C			
	4	WWTP Effluent BOD	2015-10-01	16:30	Water									X		14.1°C			
	5	WWTP Effluent Nutrients	2015-10-01	16:30	Water				X	X	X	X	X			14.1°C			
	6	WWTP Effluent Bacteriological	2015-10-01	16:30	Water	X										14.1°C			
	7	Elk River Upstream Routine	2015-10-01	16:20	Water		X	X								9.1°C			
	8	Elk River Upstream Nutrients	2015-10-01	16:20	Water				X	X	X	X	X			9.1°C			
	9	Elk River Upstream Bacteriological	2015-10-01	16:20	Water	X										9.1°C			
	10	Elk River @ Outfall Routine	2015-10-01	16:10	Water		X	X								9.0°C			
	11	Elk River @ Outfall Nutrients	2015-10-01	16:10	Water				X	X	X	X	X			9.0°C			
	12	Elk River @ Outfall Bacteriological	2015-10-01	16:10	Water	X										9.0°C			
	13	Elk River Downstream Routine	2015-10-01	16:00	Water		X	X								8.8°C			
	14	Elk River Downstream Nutrients	2015-10-01	16:00	Water				X	X	X	X	X			8.8°C			
	15	Elk River Downstream Bacteriological	2015-10-01	16:00	Water	X										8.8°C			
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE		<input type="radio"/> RUSH		SPECIFY DATE:		(surcharge may apply)		RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:			
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT		<input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)						RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:			
INVOICE FORMAT:		<input type="checkbox"/> HARDCOPY		<input type="checkbox"/> PDF		<input type="checkbox"/> FAX				Bo Choroszewski		DATE:		2015-10-01		RECEIVED BY:			
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com						FOR LAB USE ONLY		Cook- Seal Intact?		Sample Temperature: 5 °C		Cooling Method?					
		Yes		No		N/A		Frozen?		Yes		No		Icepacks		Ice			



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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ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1688947-1 WWTP INFLUENT Sampled By: BC on 15-OCT-15 @ 15:40 Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	67	DLHC	20	mg/L		16-OCT-15	R3293494
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 Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		21-OCT-15	R3293984
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-OCT-15	R3293494
Chemical Oxygen Demand	13		10	mg/L		22-OCT-15	R3295645
Orthophosphate-Dissolved (as P)	0.467	DLA	0.025	mg/L		16-OCT-15	R3291989
Coliform Bacteria - Fecal	10	OCR	1	CFU/100mL		16-OCT-15	R3291509
Phosphorus (P)-Total	0.505	DLHC	0.025	mg/L		22-OCT-15	R3294679
Total Suspended Solids	<3.0		3.0	mg/L		21-OCT-15	R3294624
pH	7.98		0.10	pH		22-OCT-15	R3295411
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N)							
Nitrate (as N)	21.3		0.020	mg/L		16-OCT-15	R3292035
Nitrate+Nitrite							
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	R3292035
L1688947-3 ELK RIVER UPSTREAM 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
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)-Total	<0.0050		0.0050	mg/L		22-OCT-15	R3294679
Total Suspended Solids	<3.0		3.0	mg/L		21-OCT-15	R3294624
pH	8.25		0.10	pH		22-OCT-15	R3295411
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N)							
Nitrate (as N)	2.12		0.020	mg/L		16-OCT-15	R3292035
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	2.12		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
L1688947-4 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
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		16-OCT-15	R3291989
Coliform Bacteria - Fecal	2	OCR	1	CFU/100mL		16-OCT-15	R3291509
Phosphorus (P)-Total	0.0061		0.0050	mg/L		22-OCT-15	R3294679
Total Suspended Solids	<3.0		3.0	mg/L		21-OCT-15	R3294624

* 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
L1688947-4 ELK RIVER @ OUTFALL Sampled By: BC on 15-OCT-15 @ 16:05 Matrix: WATER							
pH	8.17		0.10	pH		22-OCT-15	R3295411
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N)							
Nitrate (as N)	2.15		0.020	mg/L		16-OCT-15	R3292035
Nitrate+Nitrite							
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)-Total	<0.0050		0.0050	mg/L		22-OCT-15	R3294679
Total Suspended Solids	<3.0		3.0	mg/L		21-OCT-15	R3294624
pH	8.28		0.10	pH		22-OCT-15	R3295411
NO2, NO3 (BC codes) and Sum of NO2/NO3							
Nitrate (as N)							
Nitrate (as N)	2.15		0.020	mg/L		16-OCT-15	R3292035
Nitrate+Nitrite							
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

* 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
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects.
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 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 -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 colorimetrically and a decrease in absorbance at 420 nm is proportional to the COD. Samples with concentrations > 150 mg/L can be diluted into the linear range.			
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level.			
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
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-BC-IC-CL	Water	Nitrite in Water by IC	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
NO3-BC-IC-CL	Water	Nitrate (as N)	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE **1** OF **1**

COMPANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION			ATTN:	PATRICK MAJER	ANALYSIS REQUESTED:														
ADDRESS:	1505 - 17TH AVENUE SOUTH WEST																			
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2															
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Bo Choroszewski															
PROJECT NAME AND NO.:	Ferne Alpine Resort- Fall 2015 EMS wk 3			QUOTE NO.:																
PO NO.:		ALS CONTACT:	Ljudmyla Shvets																	
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: <u>pmajer@skirf.com</u> <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:																			

WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME												
1	WWTP Influent Routine	1	2015-10-15 15:40	Water		X	X								10.8 °C
	WWTP Influent BOD	2	2015-10-15 15:40	Water									X		10.8 °C
2	WWTP Effluent Routine	3	2015-10-15 15:45	Water		X	X							X	14.9 °C
	WWTP Effluent BOD	4	2015-10-15 15:45	Water									X		14.9 °C
3	WWTP Effluent Nutrients	5	2015-10-15 15:45	Water				X	X	X	X	X			14.9 °C
	WWTP Effluent Bacteriological	6	2015-10-15 15:45	Water	X										14.9 °C
4	Elk River Upstream Routine	7	2015-10-15 15:55	Water		X	X								7.6 °C
	Elk River Upstream Nutrients	8	2015-10-15 15:55	Water				X	X	X	X	X			7.6 °C
5	Elk River Upstream Bacteriological	9	2015-10-15 15:55	Water	X										7.6 °C
	Elk River @ Outfall Routine	10	2015-10-15 16:05	Water		X	X								7.1 °C
6	Elk River @ Outfall Nutrients	11	2015-10-15 16:05	Water				X	X	X	X	X			7.1 °C
	Elk River @ Outfall Bacteriological	12	2015-10-15 16:05	Water	X										7.1 °C
7	Elk River Downstream Routine	13	2015-10-15 16:15	Water		X	X								6.8 °C
	Elk River Downstream Nutrients	14	2015-10-15 16:15	Water				X	X	X	X	X			6.8 °C
8	Elk River Downstream Bacteriological	15	2015-10-15 16:15	Water	X										6.8 °C

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)		TIME:	<i>MM</i>	TIME: <i>16:20</i>
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	RELINQUISHED BY:	DATE: 2015-10-15	RECEIVED BY:	DATE:
SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO <u>wastewater@skifernie.com</u>	Bo Choroszewski	TIME:		TIME:
		FOR LAB USE ONLY			
		Cooler Seal Intact?	Sample Temperature: <i>2</i> °C	Cooling Method?	
		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Frozen? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None	



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 23-OCT-15
Report 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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ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1692478-1 WWTP INFLUENT 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
pH	7.75		0.10	pH		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
Total Suspended Solids	<3.0		3.0	mg/L		28-OCT-15	R3299293
pH	7.95		0.10	pH		26-OCT-15	R3297387
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
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							
Nitrite (as N)	0.021		0.010	mg/L		23-OCT-15	R3299070
L1692478-3 ELK RIVER UPSTREAM Sampled By: BC on 22-OCT-15 @ 15:25 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	OCR	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
pH	8.23		0.10	pH		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							
Nitrate and Nitrite (as N)	2.09		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
L1692478-4 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
Total Suspended Solids	<3.0		3.0	mg/L		28-OCT-15	R3299293

* 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
L1692478-4 ELK RIVER @ OUTFALL Sampled By: BC on 22-OCT-15 @ 15:35 Matrix: WATER							
pH	8.25		0.10	pH		26-OCT-15	R3297387
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	2.17		0.020	mg/L		23-OCT-15	R3299070
Nitrate+Nitrite							
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	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
Total Suspended Solids	<3.0		3.0	mg/L		28-OCT-15	R3299293
pH	8.25		0.10	pH		26-OCT-15	R3297387
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	2.18		0.020	mg/L		23-OCT-15	R3299070
Nitrate+Nitrite							
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	mg/L		23-OCT-15	R3299070

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
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 Incub.-O2 electrode
<p>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.</p>			
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D -Closed Reflux, Colorimetric
<p>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 colorimetrically 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.</p>			
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
<p>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.</p>			
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
<p>Ammonia is determined using the Phenate colorimetric method. Result includes both ionized (NH4+) and un-ionized (NH3) ammonia present in the sample.</p>			
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p>			
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p>			
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
<p>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.</p>			
PH-CL	Water	pH	APHA 4500 H-Electrode
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
<p>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.</p>			
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
<p>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.</p>			

** 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:

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.



SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE 1 OF 1

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:													
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST																	
CITY: CALGARY	PROV: ALBERTA	POSTAL CODE: T2T 0E2															
TEL: 403 - 256 - 8473	FAX: 403 - 244 - 3774	SAMPLER: Bo Choroszewski															
PROJECT NAME AND NO.: Fernie Alpine Resort- Fall 2015 EMS wk 4		QUOTE NO:															
PO NO.:	ALS CONTACT: Lyudmyla Shvets																
REPORT FORMAT:		<input checked="" type="checkbox"/> HARD COPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:															
WO#	SAMPLE IDENTIFICATION		DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)	
			YYYY-MM-DD	TIME													
FOR LAB USE ONLY	1	WWTP Influent Routine	2015-10-22	15:10	Water		X	X								12.9 °C	
		WWTP Influent BOD	2015-10-22	15:10	Water									X			12.9 °C
		WWTP Effluent Routine	2015-10-22	15:15	Water		X	X							X		14.5 °C
	2	WWTP Effluent BOD	2015-10-22	15:15	Water									X			14.5 °C
		WWTP Effluent Nutrients	2015-10-22	15:15	Water				X	X	X	X	X				14.5 °C
		WWTP Effluent Bacteriological	2015-10-22	15:15	Water	X											14.5 °C
	3	Elk River Upstream Routine	2015-10-22	15:25	Water		X	X									6.6 °C
		Elk River Upstream Nutrients	2015-10-22	15:25	Water				X	X	X	X	X				6.6 °C
		Elk River Upstream Bacteriological	2015-10-22	15:25	Water	X											6.6 °C
	4	Elk River @ Outfall Routine	2015-10-22	15:35	Water		X	X									6.6 °C
		Elk River @ Outfall Nutrients	2015-10-22	15:35	Water				X	X	X	X	X				6.6 °C
		Elk River @ Outfall Bacteriological	2015-10-22	15:35	Water	X											6.6 °C
	5	Elk River Downstream Routine	2015-10-22	15:45	Water		X	X									6.7 °C
		Elk River Downstream Nutrients	2015-10-22	15:45	Water				X	X	X	X	X				6.7 °C
		Elk River Downstream Bacteriological	2015-10-22	15:45	Water	X											6.7 °C
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)		RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:		2015-10-22 9:54					
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)		RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:		2015-10-22 16:00					
INVOICE FORMAT:		<input type="checkbox"/> HARD COPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX		Bo Choroszewski		TIME:		TIME:		TIME:							
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skierfernie.com		FOR LAB USE ONLY		Cooler Seal Intact?		Sample Temperature:		Cooling Method?							
				Yes ___ No ___ N/A		Yes ___ No ___		3 °C		Icepacks ___ Ice ___ None ___							



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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1695309-1 WWTP INFLUENT Sampled By: BC on 28-OCT-15 @ 15:15 Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	34	DLHC	20	mg/L		30-OCT-15	R3305021
Total Suspended Solids	54.5	DLHC	5.0	mg/L		03-NOV-15	R3306295
pH	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
pH	7.83		0.10	pH		04-NOV-15	R3306290
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	22.8		0.020	mg/L		29-OCT-15	R3305091
Nitrate+Nitrite							
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-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	8.15		0.10	pH		04-NOV-15	R3306290
NO2, NO3 and Sum of NO2/NO3							
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							
Nitrite (as N)	<0.010		0.010	mg/L		29-OCT-15	R3305091
L1695309-4 ELK RIVER OUTFALL Sampled By: BC on 28-OCT-15 @ 15:50 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

* 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
L1695309-4 ELK RIVER OUTFALL Sampled By: BC on 28-OCT-15 @ 15:50 Matrix: WATER							
pH	7.88		0.10	pH		04-NOV-15	R3306290
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	2.22		0.020	mg/L		29-OCT-15	R3305091
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	2.22		0.050	mg/L		04-NOV-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		29-OCT-15	R3305091
L1695309-5 ELK RIVER DOWNSTREAM Sampled By: BC on 28-OCT-15 @ 16:00 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	8.13		0.10	pH		04-NOV-15	R3306290
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
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 in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		29-OCT-15	R3305091

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

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day Incub.-O2 electrode
<p>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.</p>			
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D -Closed Reflux, Colorimetric
<p>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 colorimetrically 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.</p>			
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
<p>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.</p>			
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
<p>Ammonia is determined using the Phenate colorimetric method. Result includes both ionized (NH4+) and un-ionized (NH3) ammonia present in the sample.</p>			
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p>			
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p>			
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
<p>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.</p>			
PH-CL	Water	pH	APHA 4500 H-Electrode
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
<p>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.</p>			
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
<p>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.</p>			

** 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:

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.



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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ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1699372-1 WWTP INFLUENT 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
pH	7.61		0.10	pH		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	pH		13-NOV-15	R3312077
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	10.3		0.020	mg/L		07-NOV-15	R3311866
Nitrate+Nitrite							
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
Total Suspended Solids	<3.0		3.0	mg/L		12-NOV-15	R3311184
pH	8.15		0.10	pH		13-NOV-15	R3312077
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.72		0.020	mg/L		07-NOV-15	R3311866
Nitrate+Nitrite							
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 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	0.0605		0.0050	mg/L		16-NOV-15	R3312128
Total Suspended Solids	<3.0		3.0	mg/L		12-NOV-15	R3311184

* 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
L1699372-4 ELK RIVER @ OUTFALL Sampled By: BC on 05-NOV-15 @ 17:10 Matrix: WATER							
pH	8.25		0.10	pH		13-NOV-15	R3312077
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.52		0.020	mg/L		07-NOV-15	R3311866
Nitrate+Nitrite							
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	mg/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
pH	8.20		0.10	pH		13-NOV-15	R3312077
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.98		0.020	mg/L		07-NOV-15	R3311866
Nitrate+Nitrite							
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	mg/L		07-NOV-15	R3311866

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

Reference Information

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 References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day Incub.-O2 electrode
<p>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.</p>			
COD-CL	Water	Chemical Oxygen Demand	APHA 5220 D -Closed Reflux, Colorimetric
<p>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 colorimetrically 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.</p>			
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
<p>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.</p>			
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH4-CL	Water	Ammonia-N	APHA 4500 NH3F-Colorimetry
<p>Ammonia is determined using the Phenate colorimetric method. Result includes both ionized (NH4+) and un-ionized (NH3) ammonia present in the sample.</p>			
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p>			
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p>			
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
<p>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.</p>			
PH-CL	Water	pH	APHA 4500 H-Electrode
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
<p>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.</p>			
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
<p>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.</p>			

** 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

Reference Information

Test Method References:

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

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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

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

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



L1699372-COFC

Sas

SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY:		FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN:	PATRICK MAJER	ANALYSIS REQUESTED:												
ADDRESS:		1505 - 17TH AVENUE SOUTH WEST																
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2													
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Bo Choroszewski													
PROJECT NAME AND NO.:		Fernie Alpine Resort- Fall 2015 EMS wk 6		QUOTE NO.:														
PO NO.:		ALS CONTACT:	Ljudmyla Shvets															
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: <u>pmajer@skircr.com</u>																	
	<input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:																	
FOR LAB USE ONLY	WO#	SAMPLE IDENTIFICATION		DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)	
	1	WWTP Influent Routine	1 ^{Marked} _{6-Nov/15}	2015-11-05	16:50	Water		X	X								12.5°C	
		WWTP Influent BOD	2	2015-11-05	16:50	Water									X			12.5°C
		WWTP Effluent Routine	3	2015-11-05	16:55	Water		X	X							X		12.9°C
	2	WWTP Effluent BOD	4	2015-11-05	16:55	Water									X			12.9°C
		WWTP Effluent Nutrients	5	2015-11-05	16:55	Water				X	X	X	X	X				12.9°C
		WWTP Effluent Bacteriological	6	2015-11-05	16:55	Water	X											12.9°C
	3	Elk River Upstream Routine	7	2015-11-05	17:05	Water	X	X										2.7°C
		Elk River Upstream Nutrients	8	2015-11-05	17:05	Water				X	X	X	X	X				2.7°C
		Elk River Upstream Bacteriological	9	2015-11-05	17:05	Water	X											2.7°C
	4	Elk River @ Outfall Routine	10	2015-11-05	17:10	Water		X	X									3.0°C
		Elk River @ Outfall Nutrients	11	2015-11-05	17:10	Water				X	X	X	X	X				3.0°C
		Elk River @ Outfall Bacteriological	12	2015-11-05	17:10	Water	X											3.0°C
	5	Elk River Downstream Routine	13	2015-11-05	17:15	Water		X	X									2.5°C
		Elk River Downstream Nutrients	14	2015-11-05	17:15	Water				X	X	X	X	X				2.5°C
	Elk River Downstream Bacteriological	15	2015-11-05	17:15	Water	X											2.5°C	
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)				RELINQUISHED BY:		DATE:		RECEIVED BY:	DATE:	11/6						
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)						TIME:		TIME:	11:17							
INVOICE FORMAT:		<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX						DATE:	2015-11-05	RECEIVED BY:	DATE:							
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4852 OR E-MAIL TO wastewater@skirfernie.com						Bo Choroszewski	TIME:	17:30	TIME:							
						FOR LAB USE ONLY		Cooler Seal Intact?	Sample Temperature: 1°C	Cooling Method?								
								Yes No N/A	Frozen? Yes No	Icepacks Ice None								



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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ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1664741-1 WWTP INFLUENT 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
pH	7.73		0.10	pH		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
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-15	R3259513
pH	7.87		0.10	pH		02-SEP-15	R3258717

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

Reference Information

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 Incub.-O2 electrode
This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.			
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level.			
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
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-BC-IC-CL	Water	Nitrite in Water by IC	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
NO3-BC-IC-CL	Water	Nitrate (as N)	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 26-FEB-15
Report Date: 03-MAR-15 16:18 (MT)
Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1581788
Project P.O. #: NOT SUBMITTED
Job Reference: WASTEWATER - FEBRUARY 2015 MONTHLY
EMS
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets
Account Manager

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1581788-1 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
pH	7.92		0.10	pH		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
Orthophosphate-Dissolved (as P)	0.196	DLA	0.050	mg/L		27-FEB-15	R3153283
Coliform Bacteria - Fecal	1	OCR	1	CFU/100mL		26-FEB-15	R3153218
Phosphorus (P)-Total	0.222	DLA	0.050	mg/L		28-FEB-15	R3153397
Total Suspended Solids	<3.0		3.0	mg/L		26-FEB-15	R3153104
pH	8.00		0.10	pH		27-FEB-15	R3153276
NO2, NO3 and Sum of NO2/NO3							
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							
Nitrite (as N)	<0.10	DLA	0.10	mg/L		26-FEB-15	R3152701

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

Reference Information

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 Incub.-O2 electrode
This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.			
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level.			
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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.			

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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

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

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

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D.L. - The reporting limit.

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

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L1581788-COFC

SEND REPORT TO:

CHAIN OF CUSTODY FORM

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:											
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST															
CITY: CALGARY	PROV: ALBERTA	POSTAL CODE: T2T 0E2													
TEL: 403 - 256 - 8473	FAX: 403 - 244 - 3774	SAMPLER: Bo Choroszewski													
PROJECT NAME AND NO.: Wastewater - February 2015 Monthly EMS		QUOTE NO:													
PO NO:	ALS CONTACT: Lyudmyla Shvets														
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:														
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME												
FOR LAB USE ONLY	1	WWTP Influent Routine	2015-02-25	15:40	Water	X	X								9.7°C
		WWTP Influent BOD	2015-02-25	15:40	Water								X		9.7°C
	2	WWTP Effluent Routine	2015-02-25	15:45	Water	X	X								12.1°C
		WWTP Effluent BOD	2015-02-25	15:45	Water								X		12.1°C
		WWTP Effluent Nutrients	2015-02-25	15:45	Water			X	X	X	X	X			12.1°C
		WWTP Effluent Bacteriological	2015-02-25	15:45	Water	X									12.1°C
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)		RELINQUISHED BY: HUNGRY BAYTALUKE		DATE: _____		RECEIVED BY: <i>Bm</i>		DATE: 2/20/15		TIME: 10:50			
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)		RELINQUISHED BY: BO CHOROSZEWSKI		DATE: 2015-02-25		RECEIVED BY: _____		DATE: _____		TIME: 17:00			
INVOICE FORMAT:		<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX		FOR LAB USE ONLY											
SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com				Cooler Seal Intact?		Sample Temperature: 4°C		Cooling Method?							
				Yes ___ No ___ N/A		Frozen? Yes ___ No ___		Icepacks ___ Ice ___ None ___							



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 31-JUL-15
Report 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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ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1651065-1 WWTP INFLUENT Sampled By: BO CHOROSZEWSKI on 30-JUL-15 @ 15:15 Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	92.6		2.0	mg/L		31-JUL-15	R3238969
Total Suspended Solids	138	DLM	6.0	mg/L		06-AUG-15	R3242167
pH	8.08		0.10	pH		01-AUG-15	R3237080
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	R3239493
Biochemical Oxygen Demand	<2.0		2.0	mg/L		31-JUL-15	R3238969
Orthophosphate-Dissolved (as P)	0.105	DLA	0.010	mg/L		31-JUL-15	R3237369
Coliform Bacteria - Fecal	<1		1	CFU/100mL		31-JUL-15	R3237263
Nitrate (as N)	21.2		0.020	mg/L		31-JUL-15	R3238548
Nitrate and Nitrite (as N)	21.2		0.050	mg/L		05-AUG-15	
Nitrite (as N)	<0.010		0.010	mg/L		31-JUL-15	R3238548
Phosphorus (P)-Total	0.149	DLA	0.010	mg/L		07-AUG-15	R3242067
Total Suspended Solids	<3.0		3.0	mg/L		06-AUG-15	R3242167
pH	8.06		0.10	pH		01-AUG-15	R3237080

* 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.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-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.			
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-BC-IC-CL	Water	Nitrite in Water by IC	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
NO3-BC-IC-CL	Water	Nitrate (as N)	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



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. #: NOT SUBMITTED
Job Reference: FERNIE ALPINE RESORT - SPRING 2015 EMS WK
1
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets
Account Manager

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ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

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							
Miscellaneous Parameters							
Biochemical Oxygen Demand	234		2.0	mg/L		30-APR-15	R3185505
Total Suspended Solids	112		9.0	mg/L		04-MAY-15	R3185578
pH	7.38		0.10	pH		30-APR-15	R3183279
L1605448-2 WWTP EFFLUENT Sampled By: BC on 29-APR-15 @ 15:10 Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/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
pH	7.70		0.10	pH		30-APR-15	R3183279
NO2, NO3 and Sum of NO2/NO3							
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							
Nitrite (as N)	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							
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	1	OCR	1	CFU/100mL		30-APR-15	R3183272
Phosphorus (P)-Total	0.0159		0.0050	mg/L		05-MAY-15	R3185494
Total Suspended Solids	4.7		3.0	mg/L		04-MAY-15	R3185578
pH	8.36		0.10	pH		30-APR-15	R3183279
NO2, NO3 and Sum of NO2/NO3							
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							
Nitrite (as N)	<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							
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	<1		1	CFU/100mL		30-APR-15	R3183272
Phosphorus (P)-Total	0.0185		0.0050	mg/L		05-MAY-15	R3185494
Total Suspended Solids	7.3		3.0	mg/L		04-MAY-15	R3185578

* 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
L1605448-4 ELK RIVER @ OUTFALL Sampled By: BC on 29-APR-15 @ 15:35 Matrix: WATER							
pH	8.48		0.10	pH		30-APR-15	R3183279
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.935		0.020	mg/L		30-APR-15	R3183942
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.935		0.050	mg/L		04-MAY-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		30-APR-15	R3183942
L1605448-5 ELK RIVER DOWNSTREAM Sampled By: BC on 29-APR-15 @ 15:45 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	8.49		0.10	pH		30-APR-15	R3183279
NO2, NO3 and Sum of NO2/NO3							
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 in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		30-APR-15	R3183942

* 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
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 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	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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:													
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST		CITY: CALGARY		PROV: ALBERTA	POSTAL CODE: T2T 0E2												
TEL: 403 - 256 - 8473		FAX: 403 - 244 - 3774		SAMPLER: Bo Choroszewski													
PROJECT NAME AND NO.: Fernie Alpine Resort- Spring 2015 EMS wk 1		QUOTE NO:															
PO NO.:		ALS CONTACT: Lyudmyla Shvets															
REPORT FORMAT:		<input checked="" type="checkbox"/> HARDCOPY		<input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com													
		<input type="checkbox"/> FAX		<input type="checkbox"/> EXCEL		<input checked="" type="checkbox"/> PDF		<input type="checkbox"/> OTHER:									
WO#	SAMPLE IDENTIFICATION		DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, duo dates, etc.)	
			YYYY-MM-DD	TIME													
FOR LAB USE ONLY	1	WWTP Influent Routine	2015-04-29	15:00	Water		X	X							X	10.7°C	
		WWTP Influent BOD	2015-04-29	15:00	Water									X		10.7°C	
		WWTP Effluent Routine	2015-04-29	15:10	Water		X	X							X	12.6°C	
	2	WWTP Effluent BOD	2015-04-29	15:10	Water									X		12.6°C	
		WWTP Effluent Nutrients	2015-04-29	15:10	Water				X	X	X	X	X			12.6°C	
		WWTP Effluent Bacteriological	2015-04-29	15:10	Water	X										12.6°C	
	3	Elk River Upstream Routine	2015-04-29	15:25	Water		X	X								8.3°C	
		Elk River Upstream Nutrients	2015-04-29	15:25	Water				X	X	X	X	X			8.3°C	
		Elk River Upstream Bacteriological	2015-04-29	15:25	Water	X										8.3°C	
	4	Elk River @ Outfall Routine	2015-04-29	15:35	Water		X	X								8.3°C	
		Elk River @ Outfall Nutrients	2015-04-29	15:35	Water				X	X	X	X	X			8.3°C	
		Elk River @ Outfall Bacteriological	2015-04-29	15:35	Water	X										8.3°C	
	5	Elk River Downstream Routine	2015-04-29	15:45	Water		X	X								8.3°C	
		Elk River Downstream Nutrients	2015-04-29	15:45	Water				X	X	X	X	X			8.3°C	
		Elk River Downstream Bacteriological	2015-04-29	15:45	Water	X										8.3°C	
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE		<input type="radio"/> RUSH		SPECIFY DATE: _____ (surcharge may apply)		RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:			
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT		<input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)		RELINQUISHED BY:		DATE:		2015-04-29		RECEIVED BY:		DATE:			
INVOICE FORMAT:		<input type="checkbox"/> HARDCOPY		<input type="checkbox"/> PDF		<input type="checkbox"/> FAX		Bo Choroszewski		TIME: 16:15		RECEIVED BY:		DATE:			
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com		FOR LAB USE ONLY		Cooler Seal Intact?		Sample Temperature: _____ °C		Cooling Method?							
						Yes ___ No ___ N/A		Frozen? ___ Yes ___ No		Icepacks ___ Ice ___ None							



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

Lyudmyla Shvets
Account Manager

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ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1609147-1 WWTP INFLUENT 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
pH	7.94		0.10	pH		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)-Total	0.170	DLA	0.010	mg/L		14-MAY-15	R3190311
Total Suspended Solids	<3.0		3.0	mg/L		13-MAY-15	R3190221
pH	7.99		0.10	pH		09-MAY-15	R3188064
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
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		11-MAY-15	
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							
Ammonia, Total (as N)	<0.050		0.050	mg/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	0.0172		0.0050	mg/L		14-MAY-15	R3190311
Total Suspended Solids	11.3		3.0	mg/L		13-MAY-15	R3190221
pH	8.45		0.10	pH		09-MAY-15	R3188064
NO2, NO3 and Sum of NO2/NO3							
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							
Nitrite (as N)	<0.010		0.010	mg/L		08-MAY-15	R3188039
L1609147-4 ELKRIVER OUTFALL Sampled By: HB on 07-MAY-15 @ 14:45 Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/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	0.0153		0.0050	mg/L		14-MAY-15	R3190311
Total Suspended Solids	10.0		3.0	mg/L		13-MAY-15	R3190221

* 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
L1609147-4 ELKRIVER OUTFALL Sampled By: HB on 07-MAY-15 @ 14:45 Matrix: WATER							
pH	8.45		0.10	pH		09-MAY-15	R3188064
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.30		0.020	mg/L		08-MAY-15	R3188039
Nitrate+Nitrite							
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							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/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
pH	8.46		0.10	pH		09-MAY-15	R3188064
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.49		0.020	mg/L		08-MAY-15	R3188039
Nitrate+Nitrite							
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

* 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
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 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	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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 14-MAY-15
Report Date: 22-MAY-15 11:43 (MT)
Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1611776
Project P.O. #: NOT SUBMITTED
Job Reference: FERNIE ALPINE RESORT - SPRING 2015 EMS
WEEK 3
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets
Account Manager

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ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1611776-1 WWTP INFLUENT Sampled By: Bo Choroszewski on 13-MAY-15 @ 15:10 Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	57.0		2.0	mg/L		14-MAY-15	R3192107
Total Suspended Solids	54.7		3.0	mg/L		15-MAY-15	R3191743
pH	7.83		0.10	pH		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
pH	7.86		0.10	pH		14-MAY-15	R3190355
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	21.5		0.020	mg/L		14-MAY-15	R3191749
Nitrate+Nitrite							
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							
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	4	OCR	1	CFU/100mL		14-MAY-15	R3191029
Phosphorus (P)-Total	0.0223		0.0050	mg/L		19-MAY-15	R3192357
Total Suspended Solids	<3.0		3.0	mg/L		15-MAY-15	R3191743
pH	8.40		0.10	pH		14-MAY-15	R3190355
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.45		0.020	mg/L		14-MAY-15	R3191749
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.45		0.050	mg/L		19-MAY-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		14-MAY-15	R3191749
L1611776-4 ELK RIVER @ OUTFALL 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

* 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
L1611776-4 ELK RIVER @ OUTFALL Sampled By: Bo Choroszewski on 13-MAY-15 @ 15:40 Matrix: WATER							
pH	8.41		0.10	pH		14-MAY-15	R3190355
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.31		0.020	mg/L		14-MAY-15	R3191749
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.31		0.050	mg/L		19-MAY-15	
Nitrite in Water by IC							
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 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	OCR	1	CFU/100mL		14-MAY-15	R3191029
Phosphorus (P)-Total	0.0107		0.0050	mg/L		19-MAY-15	R3192357
Total Suspended Solids	<3.0		3.0	mg/L		15-MAY-15	R3191743
pH	8.46		0.10	pH		14-MAY-15	R3190355
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.54		0.020	mg/L		14-MAY-15	R3191749
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.54		0.050	mg/L		19-MAY-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		14-MAY-15	R3191749

* 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
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 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	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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



L1611776-COFC

Toll Free: 1-800-665-0243 Fax: 604-493-6700
0-261-6517 Fax: 250-261-5587
3 Toll Free: 1-800-666-9878 Fax: 780-513-2191
791-1524 Fax: 780-791-1586
Toll Free: 1-800-668-9878 Fax: 780-437-2311
1-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
1-9897 Toll Free: 1-800-667-7645 Fax: 306-668-8383

www.alsenviro.com

SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE **1** OF **1**

COMPANY:	FERNIE ALPINE RESORT UTILITIES CORPORATION			ATTN:	PATRICK MAJER	ANALYSIS REQUESTED:									
ADDRESS:	1505 - 17TH AVENUE SOUTH WEST														
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2										
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Bo Choroszewski										
PROJECT NAME AND NO.:	Ferne Alpine Resort- Spring 2015 EMS wk 3			QUOTE NO.:											
PO NO.:		ALS CONTACT:	Lyudmyla Shvets												
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: <u>pmajer@skircr.com</u> <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:														

WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	...	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME													
1	WWTP Influent Routine	2015-05-13	15:00	Water		X	X									10.3°C
2	WWTP Influent BOD	2015-05-13	15:10	Water									X			10.3°C
3	WWTP Effluent Routine	2015-05-13	15:20	Water		X	X							X		12.2°C
4	WWTP Effluent BOD	2015-05-13	15:20	Water									X			12.2°C
5	WWTP Effluent Nutrients	2015-05-13	15:20	Water				X	X	X	X	X				12.2°C
6	WWTP Effluent Bacteriological	2015-05-13	15:20	Water	X											12.2°C
7	Elk River Upstream Routine	2015-05-13	15:30	Water		X	X									5.9°C
8	Elk River Upstream Nutrients	2015-05-13	15:30	Water				X	X	X	X	X				5.9°C
9	Elk River Upstream Bacteriological	2015-05-13	15:30	Water	X											5.9°C
10	Elk River @ Outfall Routine	2015-05-13	15:40	Water		X	X									5.6°C
11	Elk River @ Outfall Nutrients	2015-05-13	15:40	Water				X	X	X	X	X				5.6°C
12	Elk River @ Outfall Bacteriological	2015-05-13	15:40	Water	X											5.6°C
13	Elk River Downstream Routine	2015-05-13	15:50	Water		X	X									5.8°C
14	Elk River Downstream Nutrients	2015-05-13	15:50	Water				X	X	X	X	X				5.8°C
15	Elk River Downstream Bacteriological	2015-05-13	15:50	Water	X											5.8°C

TURN AROUND REQUIRED:	<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)	RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
SEND INVOICE TO:	<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)	RELINQUISHED BY:	DATE: 2015-05-13	RECEIVED BY:	DATE:
INVOICE FORMAT:	<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX	Bo Choroszewski	TIME: 16:15		TIME:
SPECIAL INSTRUCTIONS:	PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO <u>wastewater@skifernie.com</u>	FOR LAB USE ONLY			
		Center Seal Intact?	Sample Temperature: <u>7</u> °C	Cooling Method?	
		Yes ___ No ___ N/A	Frozen? Yes ___ No ___	Icepacks ___ Ice ___ None ___	



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. #: NOT SUBMITTED
Job Reference: FERNIE ALPINE RESORT - SPRING 2015 EMS WK
4
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
L1615199-1 WWTP INFLUENT Sampled By: BC on 21-MAY-15 @ 15:10 Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	96.0		2.0	mg/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		1	CFU/100mL		22-MAY-15	R3194681
Phosphorus (P)-Total	0.257	DLA	0.025	mg/L		26-MAY-15	R3195931
Total Suspended Solids	<3.0		3.0	mg/L		24-MAY-15	R3195331
pH	7.90		0.10	pH		22-MAY-15	R3194690
NO2, NO3 and Sum of NO2/NO3							
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							
Nitrite (as N)	0.024		0.010	mg/L		23-MAY-15	R3196806
L1615199-3 ELK RIVER UPSTREAM 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
pH	8.32		0.10	pH		22-MAY-15	R3194690
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.33		0.020	mg/L		23-MAY-15	R3196806
Nitrate+Nitrite							
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							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.426		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	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

* 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
L1615199-4 ELK RIVER @ OUTFALL Sampled By: BC on 21-MAY-15 @ 15:40 Matrix: WATER							
pH	8.36		0.10	pH		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	mg/L		23-MAY-15	R3196806
L1615199-5 ELK RIVER DOWNSTREAM 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	pH		22-MAY-15	R3194690
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.40		0.020	mg/L		23-MAY-15	R3196806
Nitrate+Nitrite							
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

* 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
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 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	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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



Vancouver BC, 1988 Truoph Street V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-667-0243
 Fort St. John BC, Box 250, R31 - 96A Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5518
 Grand Prairie AB, 9595 111 Street, T8V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9876
 Fort McMurray AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1525
 Edmonton AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878
 Calgary AB, Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-667-7676
 Saskatoon SK, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7676



L1615199-COFC

SEND REPORT TO:

CHAIN OF CUSTODY FORM

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:											
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST															
CITY: CALGARY	PROV: ALBERTA	POSTAL CODE: T2T 0E2													
TEL: 403 - 256 - 8473	FAX: 403 - 244 - 3774	SAMPLER: Bo Choroszewski													
PROJECT NAME AND NO.: Fernie Alpine Resort- Spring 2015 EMS wk 4		QUOTE NO.:													
PO NO.:	ALS CONTACT: Lyudmyla Shveits														
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:														
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, duo dates, etc.)
		YYYY-MM-DD	TIME												
FOR LAB USE ONLY	1	WWTP Influent Routine	2015-05-21	15:10	Water	X	X								12.8 °C
		2	WWTP Influent BOD	2015-05-21	15:10	Water							X		12.8 °C
		3	WWTP Effluent Routine	2015-05-21	15:15	Water	X	X						X	13.2 °C
		4	WWTP Effluent BOD	2015-05-21	15:15	Water							X		13.2 °C
		5	WWTP Effluent Nutrients	2015-05-21	15:15	Water			X	X	X	X	X		13.2 °C
		6	WWTP Effluent Bacteriological	2015-05-21	15:15	Water	X								13.2 °C
		7	Elk River Upstream Routine	2015-05-21	15:30	Water	X	X							11.6 °C
		8	Elk River Upstream Nutrients	2015-05-21	15:30	Water			X	X	X	X	X		11.6 °C
		9	Elk River Upstream Bacteriological	2015-05-21	15:30	Water	X								11.6 °C
		10	Elk River @ Outfall Routine	2015-05-21	15:40	Water	X	X							10.1 °C
		11	Elk River @ Outfall Nutrients	2015-05-21	15:40	Water			X	X	X	X	X		10.1 °C
		12	Elk River @ Outfall Bacteriological	2015-05-21	15:40	Water	X								10.1 °C
		13	Elk River Downstream Routine	2015-05-21	15:50	Water	X	X							9.9 °C
		14	Elk River Downstream Nutrients	2015-05-21	15:50	Water			X	X	X	X	X		9.9 °C
		15	Elk River Downstream Bacteriological	2015-05-21	15:50	Water	X								9.9 °C
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)		RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:		DATE:		DATE:	
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)		RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:		DATE:		DATE:	
INVOICE FORMAT:		<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX		Bo Choroszewski		DATE: 2015-05-21		RECEIVED BY: [Signature]		DATE: 16:00		DATE:		DATE:	
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com		FOR LAB USE ONLY											
				Cooler Seal Intact?		Sample Temperature: 2 °C		Cooling Method?							
				Yes ___ No ___ N/A		Frozen? Yes ___ No ___		Icepacks ___ Ice ___ None ___							



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 29-MAY-15
Report Date: 05-JUN-15 14:11 (MT)
Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1618623
Project P.O. #: NOT SUBMITTED
Job Reference: 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
L1618623-1 WWTP INFLUENT Sampled By: BC on 28-MAY-15 @ 16:20 Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	95.4		2.0	mg/L		29-MAY-15	R3200889
Total Suspended Solids	70.0	DLM	9.0	mg/L		01-JUN-15	R3199650
pH	7.71		0.10	pH		04-JUN-15	R3201776
L1618623-2 WWTP EFFLUENT 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
pH	7.99		0.10	pH		30-MAY-15	R3199388
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	18.0		0.020	mg/L		30-MAY-15	R3200937
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	18.0		0.050	mg/L		03-JUN-15	
Nitrite in Water by IC							
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	pH		30-MAY-15	R3199388
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.03		0.020	mg/L		30-MAY-15	R3200937
Nitrate+Nitrite							
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							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		04-JUN-15	R3201395
Orthophosphate-Dissolved (as P)	0.0061		0.0050	mg/L		30-MAY-15	R3198418
Coliform Bacteria - Fecal	24	OCR	1	CFU/100mL		29-MAY-15	R3198930
Phosphorus (P)-Total	0.0899		0.0050	mg/L		02-JUN-15	R3200397
Total Suspended Solids	89.3		3.0	mg/L		01-JUN-15	R3199650

* 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
L1618623-4 ELK RIVER @ OUTFALL Sampled By: BC on 28-MAY-15 @ 15:50 Matrix: WATER							
pH	8.27		0.10	pH		30-MAY-15	R3199388
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.03		0.020	mg/L		30-MAY-15	R3200937
Nitrate+Nitrite							
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							
Ammonia, Total (as N)	<0.050		0.050	mg/L		04-JUN-15	R3201395
Orthophosphate-Dissolved (as P)	0.0059		0.0050	mg/L		30-MAY-15	R3198418
Coliform Bacteria - Fecal	38	OCR	1	CFU/100mL		29-MAY-15	R3198930
Phosphorus (P)-Total	0.0950		0.0050	mg/L		02-JUN-15	R3200397
Total Suspended Solids	96.0		3.0	mg/L		01-JUN-15	R3199650
pH	8.28		0.10	pH		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	mg/L		03-JUN-15	
Nitrite in Water by IC							
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 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	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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



L1618623-COFC

1954 Humph Street V-11-5 Tel: (204) 257-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 C. Box 250, 9831 - 98A Avenue, V1J 6W7 Tel: 250-261-5517 Fax: 250-261-5587
 B, 9595 - 111 Street, T2V 5W1, Tel: 780-539-5196 Toll Free: 1-800-668-9878 Fax: 780-513-2191
 AB, Bay 1, 245 Macdonald Cr, 19H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 17, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY:		FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN:	PATRICK MAJER		ANALYSIS REQUESTED:												
ADDRESS:		1505 - 17TH AVENUE SOUTH WEST																	
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2														
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Bo Choroszewski														
PROJECT NAME AND NO.:		Fernie Alpine Resort- Spring 2015 EMS wk 5			QUOTE NO.:														
PO NO.:		ALS CONTACT:		Lyudmya Shvets															
REPORT FORMAT:		<input checked="" type="checkbox"/> HARDCOPY		<input checked="" type="checkbox"/> EMAIL - ADDRESS:		pmajer@skircr.com													
		<input type="checkbox"/> FAX		<input type="checkbox"/> EXCEL		<input checked="" type="checkbox"/> PDF		<input type="checkbox"/> OTHER:											
WO#	SAMPLE IDENTIFICATION		DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)			
			YYYY-MM-DD	TIME															
FOR LAB USE ONLY	1	WWTP Influent Routine	2015-05-28	16:20	Water	X	X									11.5 °C			
		WWTP Influent BOD	2015-05-28	16:20	Water									X			11.5 °C		
		WWTP Effluent Routine	2015-05-28	16:30	Water		X	X							X		13.8 °C		
	2	WWTP Effluent BOD	2015-05-28	16:30	Water									X			13.8 °C		
		WWTP Effluent Nutrients	2015-05-28	16:30	Water				X	X	X	X	X				13.8 °C		
		WWTP Effluent Bacteriological	2015-05-28	16:30	Water	X											13.8 °C		
	3	Elk River Upstream Routine	2015-05-28	15:40	Water		X	X									8.3 °C		
		Elk River Upstream Nutrients	2015-05-28	15:40	Water				X	X	X	X	X				8.3 °C		
		Elk River Upstream Bacteriological	2015-05-28	15:40	Water	X											8.3 °C		
	4	Elk River @ Outfall Routine	2015-05-28	15:50	Water		X	X									7.8 °C		
		Elk River @ Outfall Nutrients	2015-05-28	15:50	Water				X	X	X	X	X				7.8 °C		
		Elk River @ Outfall Bacteriological	2015-05-28	15:50	Water	X											7.8 °C		
	5	Elk River Downstream Routine	2015-05-28	16:00	Water		X	X									7.7 °C		
		Elk River Downstream Nutrients	2015-05-28	16:00	Water				X	X	X	X	X				7.7 °C		
		Elk River Downstream Bacteriological	2015-05-28	16:00	Water	X											7.7 °C		
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE		<input type="radio"/> RUSH		SPECIFY DATE: _____		(surcharge may apply)		RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE: <i>May 29 10:14 AM</i>			
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT		<input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)		RELINQUISHED BY:		DATE:		2015-05-28		RECEIVED BY:		DATE:					
INVOICE FORMAT:		<input type="checkbox"/> HARDCOPY		<input type="checkbox"/> PDF		<input type="checkbox"/> FAX		Bo Choroszewski		TIME: 17:00		TIME:		TIME:					
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com						FOR LAB USE ONLY											
		Cooler Seal Intact?		Yes ___ No ___ N/A		Sample Temperature: <u>6</u> °C		Cooling Method?		Icepacks ___ Ice ___ None ___		Frozen? ___ Yes ___ No ___							



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 12-JUN-15
Report Date: 18-JUN-15 16:53 (MT)
Version: FINAL

Client Phone: 403-256-8473

Certificate of Analysis

Lab Work Order #: L1625934
Project P.O. #: NOT SUBMITTED
Job Reference: FERNIE ALPINE RESORT - SPRING 2015 EMS WK
6
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1625934-1 WWTP INFLUENT Sampled By: BC on 11-JUN-15 @ 15:50 Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	196		2.0	mg/L		12-JUN-15	R3209438
Total Suspended Solids	213	DLM	15	mg/L		17-JUN-15	R3209937
pH	7.81		0.10	pH		14-JUN-15	R3207636
L1625934-2 WWTP EFFLUENT Sampled By: 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
pH	8.03		0.10	pH		14-JUN-15	R3207636
NO2, NO3 and Sum of NO2/NO3							
Nitrate (as N)							
Nitrate (as N)	17.9		0.020	mg/L		13-JUN-15	R3210002
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	17.9		0.050	mg/L		18-JUN-15	
Nitrite in Water by IC							
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)-Total	0.0349		0.0050	mg/L		18-JUN-15	R3210327
Total Suspended Solids	22.0		3.0	mg/L		17-JUN-15	R3209937
pH	8.35		0.10	pH		14-JUN-15	R3207636
NO2, NO3 and Sum of NO2/NO3							
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							
Nitrite (as N)	<0.010		0.010	mg/L		13-JUN-15	R3210002
L1625934-4 ELK RIVER @ OUFALL Sampled By: BC on 11-JUN-15 @ 15:30 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	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
L1625934-4 ELK RIVER @ OUFALL Sampled By: BC on 11-JUN-15 @ 15:30 Matrix: WATER							
pH	8.39		0.10	pH		14-JUN-15	R3207636
NO2, NO3 and Sum of NO2/NO3							
Nitrate (as N)							
Nitrate (as N)	1.11		0.020	mg/L		13-JUN-15	R3210002
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.11		0.050	mg/L		18-JUN-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		13-JUN-15	R3210002
L1625934-5 ELK RIVER DOWNSTREAM Sampled By: BC on 11-JUN-15 @ 15:25 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	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	8.40		0.10	pH		14-JUN-15	R3207636
NO2, NO3 and Sum of NO2/NO3							
Nitrate (as N)							
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 in Water by IC							
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 Adjusted due to sample matrix effects.
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 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	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-BC-IC-CL	Water	Nitrite in Water by IC	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
NO3-BC-IC-CL	Water	Nitrate (as N)	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



L1625934-COFC

CHAIN OF CUSTODY FORM

SEND REPORT TO:

COMPANY:		FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN:	PATRICK MAJER		ANALYSIS REQUESTED:											
ADDRESS:		1505 - 17TH AVENUE SOUTH WEST																
CITY:	CALGARY	PROV:	ALBERTA	POSTAL CODE:	T2T 0E2													
TEL:	403 - 256 - 8473	FAX:	403 - 244 - 3774	SAMPLER:	Bo Choroszewski													
PROJECT NAME AND NO.:		Fornie Alpine Resort- Spring 2015 EMS wk 6			QUOTE NO.:													
PO NO.:		ALS CONTACT:		Lyudmyla Shvets														
REPORT FORMAT:		<input checked="" type="checkbox"/> HARD COPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: <u>pmaier@skircr.com</u>																
		<input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:																
FOR LAB USE ONLY	WO#	SAMPLE IDENTIFICATION		DATE / TIME COLLECTED		MATRIX	Faecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)	
		YYYY-MM-DD	TIME															
	1	WWTP Influent Routine	1	2015-06-11	15:50	Water		X	X									13.8 °C
		WWTP Influent BOD	2	2015-06-11	15:50	Water									X			13.8 °C
		WWTP Effluent Routine	3	2015-06-11	15:45	Water		X	X							X		15.1 °C
	2	WWTP Effluent BOD	4	2015-06-11	15:45	Water									X			15.1 °C
		WWTP Effluent Nutrients	5	2015-06-11	15:45	Water				X	X	X	X	X				15.1 °C
		WWTP Effluent Bacteriological	6	2015-06-11	15:45	Water	X											15.1 °C
		Elk River Upstream Routine	7	2015-06-11	15:35	Water		X	X									13.7 °C
	3	Elk River Upstream Nutrients	8	2015-06-11	15:35	Water				X	X	X	X	X				13.7 °C
		Elk River Upstream Bacteriological	9	2015-06-11	15:35	Water	X											13.7 °C
		Elk River @ Outfall Routine	10	2015-06-11	15:30	Water		X	X									12.6 °C
	4	Elk River @ Outfall Nutrients	11	2015-06-11	15:30	Water				X	X	X	X	X				12.6 °C
		Elk River @ Outfall Bacteriological	12	2015-06-11	15:30	Water	X											12.6 °C
		Elk River Downstream Routine	13	2015-06-11	15:25	Water		X	X									12.7 °C
5	Elk River Downstream Nutrients	14	2015-06-11	15:25	Water				X	X	X	X	X				12.9 °C	
	Elk River Downstream Bacteriological	15	2015-06-11	15:25	Water	X											12.9 °C	
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)		REINQUISHED BY:		DATE:	RECEIVED BY:		DATE:	12 Jun/15								
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)		REINQUISHED BY:		DATE:	RECEIVED BY:		DATE:	2015-06-11								
INVOICE FORMAT:		<input type="checkbox"/> HARD COPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX		Bo Choroszewski		TIME:	TIME:		TIME:	17:00								
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com		FOR LAB USE ONLY		Cooler Seal Intact?		Sample Temperature: <u>5</u> °C		Cooling Method?								
				Yes ___ No ___ N/A		Frozen? ___ Yes ___ No		Icepacks ___ Ice ___ No/10										



ATTN: Patrick Majer
Fernie Alpine Resort Utilities Corp.
1505-17 Ave. SW
Calgary, Alberta
Canada T2T 0E2

Received: 2015/01/08, 1355
Report Date: 2015/01/19
Version: FINAL

HydroQual Test Report

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

Jacklyn / [Signature]
Technical 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.

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

Result Summary

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

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

Sample: Wastewater

Collection: collected on 2015/01/07 at 1630 by Hungry

Receipt: received on 2015/01/08 at 1355 by AH

Containers: received 2 x 20 L pails at 6 °C, in good condition with no seals and no initials

Description: type: water, collection method: grab

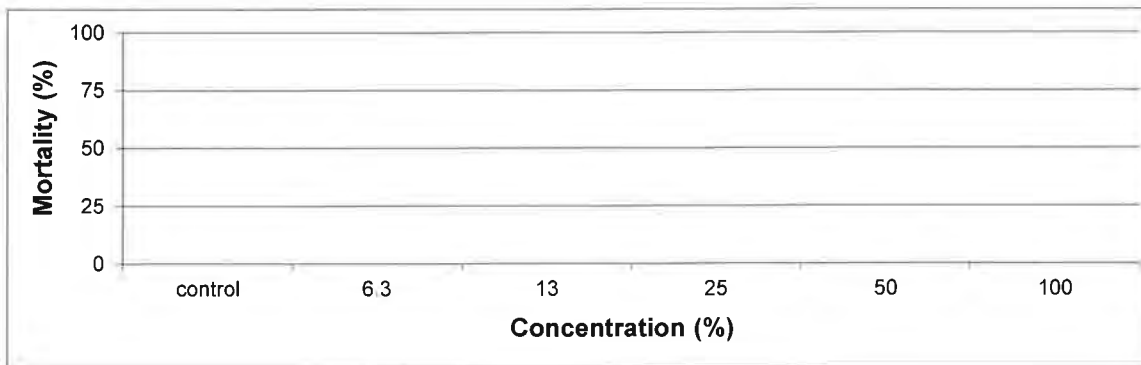
Test: started on 2015/01/09 ; ended on 2015/01/13

Contents	
Result Summary.....	1
Test Conditions.....	2
Test Data.....	3
Comments/Statistics..	5
QA/QC.....	6

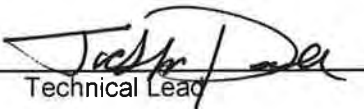
Result:

	Endpoint (96-hour)	Value (%)	Confidence Limits (95%)		Method Calculated
			lower	upper	
Acute:	LC50	>100			could not be calculated
(mortality)	LC25	>100			could not be calculated

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



The test data and results are authorized and verified correct.


Technical 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.

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 mortality: 0.13% (seven days preceding testing)

Sample initial chemistry: pH: 6.9; EC: 986 ($\mu\text{S}/\text{cm}$ @ 25°C); DO: 9.4 (mg/L); temperature: 11 °C
hardness (mg CaCO₃/L): 197; colour: yellow; odour: odourless

Sample holding time: 2 days (must be ≤ 5 days)

Sample storage: 4 \pm 2°C in darkness

Test vessel: The test was conducted in 22 L plastic pails with polyethylene liners

Test volume: 20 Litres (depth of solution in each test vessel $\geq 15\text{cm}$)

Sample pre-treatment: All test solutions and controls were pre-aerated for 120 minutes at 6.5 \pm 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 ≤ 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 \pm 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 \pm 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 Phenol (C₆H₆O) initiated December 26, 2014; current results
(96-h LC50 and 95% confidence limits) = 0.91 (0.86 - 0.96) log (mg/L Phenol)

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

Test Data

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

Test Log:

Date	Day	Time	Technician
2015/01/09	0	1115	MGC
2015/01/10	1	0815	PL/CQ
2015/01/11	2	0935	ML/NM
2015/01/12	3	1000	CB
2015/01/13	4	0845	CQ/JR

Chemistry:

Conc. (%)	control	6.3	13	25	50	100		

Day

pH (units)

0	7.8	7.7	7.7	7.8	7.8	7.6		
1	8.0	8.0	7.9	8.0	7.9	7.7		
2	8.1	8.0	8.0	8.0	7.9	7.8		
3	8.0	8.0	8.0	8.0	7.9	7.8		
4	7.9	7.9	7.9	7.9	7.9	7.7		

Conductivity (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		

Dissolved 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		

Temperature (°C)

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

Number Alive (In brackets number 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	10		
4	10	10	10	10	10	10		

Mortality (%)

4	0	0	0	0	0	0		
---	---	---	---	---	---	---	--	--

Stressed (%)

4	0	0	0	0	0	0		
---	---	---	---	---	---	---	--	--

Biology Summary Tables:

Control Fish	Length (cm)	Wet 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

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

average	3.8	0.8
sd	0.5	0.3
cv(%)	13.0	42.4

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

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

Test Method: Trout 96h Static Acute Test. (LC50, 5 treatments plus a control)
 HydroQual Test Method: WTR-ME-042

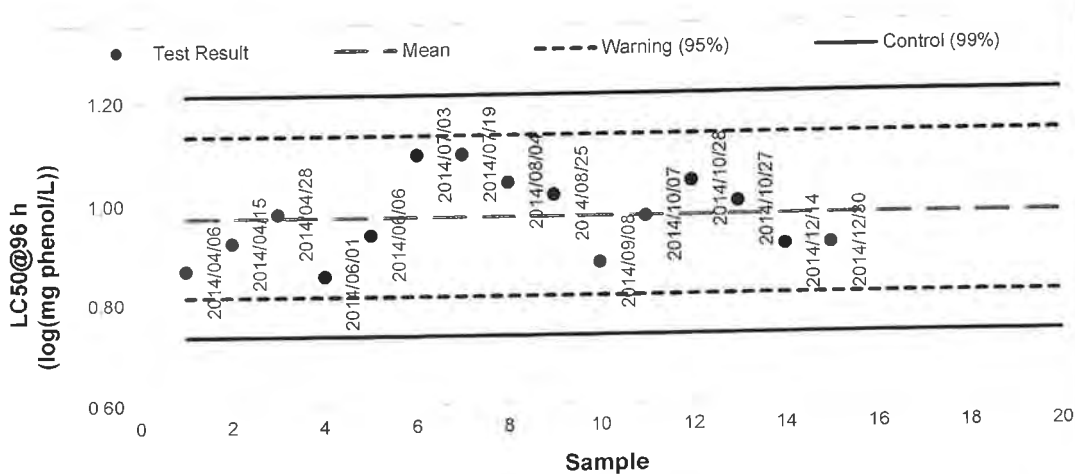
Reference: Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, 1990. Environment Canada, EPS 1/RM/13. including May 1996 and December 2000 amendments.

Test Organism:	Test Design:
test species: <i>Oncorhynchus mykiss</i>	vol. of test vessel (L): 20
culture source: Sam Livingston Fish Hatchery	test volume depth: >15 cm
temperature (°C): 15 ± 1	replicates per treatment: 1
dissolved oxygen: 70-100% saturation	fish per replicate: 10
stock mortality (last 7d): 0.12%	loading (g fish/L): ≤0.5
batch number: 20141203TR	temperature (°C): 15 ± 1
	photoperiod: 16h light: 8h dark
	light level (water surface): 100-500 lux (full-spectrum)
	control/dilution water: dechlorinated tap water

Current Test

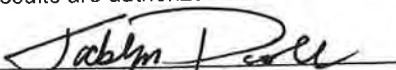
toxicant phenol (C ₆ H ₅ OH)			
started on	2014/12/26	ended on	2014/12/30
Result (LC50 @ 96h)	0.91	log (mg phenol/L); geometric mean	
Confidence Limits (95%)	lower	0.86	upper 0.96
Historical Values			
mean	0.97	sd	0.08
		cv(%)	12.1
warning limits (±2 sd)	0.81	1.13	(95% confidence limits)
control limits (±3 sd)	0.73	1.21	(99% confidence limits)

notes: sd, standard deviation; cv, coefficient of variance



Comments: None

The test data and results are authorized and verified correct.


 Technical Lead

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ATTN: Patrick Majer
Fernie Alpine Resort Utilities Corp.
1505-17 Ave. SW
Calgary, Alberta
Canada T2T 0E2

Received: 2015/05/29
Report Date: 2015/06/15
Version: FINAL

HydroQual Test Report

Client: FER116
Reference: 15-0598
Billing: FER116

A handwritten signature in cursive script, reading "Jacquelyn Poole".

Senior Verifier

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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 www.hydroqual.ca



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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.

A handwritten signature in black ink that reads "Jacklyn Poole". The signature is written in a cursive, flowing style.

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 Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 amendments).		

TEST RESULTS

Effect	Value	95% Confidence Limits	Slope	Calculation Method
96-h LC50	>100%	-	-	-

The results reported relate only to the sample tested.

POTASSIUM CHLORIDE REFERENCE TOXICANT DATA

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

TEST FISH

Control Fish Sample Size :	10	Cumulative stock tank mortality :	0.1 % (prev. 7 days)
Mean Fish Weight (\pm 2 SD) :	0.34 \pm 0.08 g	Mean Fish Fork Length (\pm 2 SD) :	35.1 \pm 2.9 mm
Range of Weights :	0.27 - 0.39 g	Range of Fork Lengths :	33 - 37 mm
Fish Loading Rate :	0.2 g/L		

TEST CONDITIONS

Test Organism :	<i>Oncorhynchus mykiss</i>	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 \pm 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 \pm 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: Shan Wil
Project Manager

Work Order: 228453
 Sample Number: 44165

Total Pre-Aeration		pH	D.O. (mg/L)	Cond. (µmhos/cm)	Temp. (°C)	O ₂ Sat. (%)*
Time (h)	Initial Water Chemistry:	7.7	8.3	691	15.0	-
0:30	Chemistry after 30min air:	7.7	8.4	693	15.0	90

0 hours

Date & Time: 2015-06-02 14:55
 Technician: SS(FS)

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O ₂ 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)

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:

48 hours

Date & Time: 2015-06-04 14:55
 Technician: FS

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

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:

96 hours

Date & Time: 2015-06-06 14:55
 Technician: TL

Test Conc. (%)	Mortality	Immobility	pH	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 stress: 0

Trout Batch #: T15-08

Number immobile does not include number of mortalities.

* adjusted for actual temp. & barometric pressure

"-" = not measured

Test Data Reviewed By: SF
 Date: 2015-06-08

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Fernie Alpine Resort Utilities Corp.
1505-17 Ave. SW
Calgary, Alberta
Canada T2T 0E2

Received: 2015/11/06
Report Date: 2015/11/23
Version: FINAL

HydroQual Test Report

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

A handwritten signature in black ink, appearing to read "D. Lopez", is positioned above a horizontal line.

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 www.hydroqual.ca

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

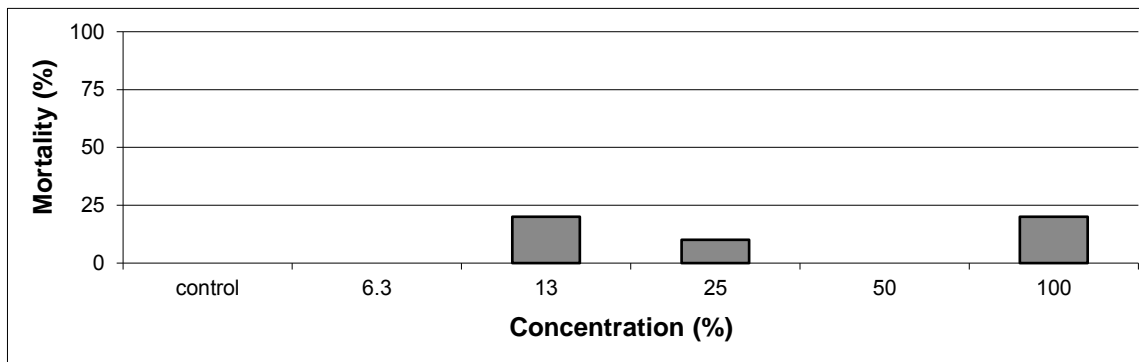
Description: type: water, collection method: grab

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

Result:

	Endpoint (96-hour)	Value (%)	Confidence Limits (95%) lower upper	Method Calculated
Acute:	LC50	>100		could not be calculated
(mortality)	LC25	>100		could not be calculated

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



The test data and results are authorized and verified correct.



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.

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 20151028TR)

Acclimation: 13 days (must be ≥ 2 weeks)

Stock mortality: 0% (seven days preceding testing)

Sample initial chemistry: pH: 6.6; EC: 576 ($\mu\text{S}/\text{cm}$ @ 25°C); DO: 8.4 (mg/L); temperature: 15 °C
hardness (mg CaCO₃/L): 200; colour: yellow; odour: odourless

Sample holding time: 5 days (must be ≤ 5 days)

Sample storage: 4 \pm 2°C in darkness

Test vessel: The test was conducted in 22 L plastic pails with polyethylene liners

Test volume: 20 Litres (depth of solution in each test vessel $\geq 15\text{cm}$)

Sample pre-treatment: All test solutions and controls were pre-aerated for 30 minutes at 6.5 \pm 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 ≤ 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 at test initiation and test termination

Aeration: All treatments aerated at 6.5 \pm 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 \pm 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

Test Data

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

Test Log:

Date	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

Chemistry:

Conc. (%)	control	6.3	13	25	50	100
-----------	---------	-----	----	----	----	-----

Day	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

Day	Conductivity ($\mu\text{S}/\text{cm}$ @ 25°C)					
0	417	437	447	470	520	606
4	413	404	409	430	472	555

430

Day	Dissolved 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

Day	Temperature (°C)					
0	14	14	14	14	14	14
4	14	14	14	14	14	14

Number Alive (In brackets number stressed):

Conc. (%)	control	6.3	13	25	50	100
-----------	---------	-----	----	----	----	-----

Day	Number Alive					
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

Day	Mortality (%)					
4	0	0	20	10	0	20

Day	Stressed (%)					
4	0	0	0	0	0	0

Biology Summary Tables:

Control Fish	Length (cm)	Wet 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

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

GENERAL TERMS AND CONDITIONS:

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").

1. **Definitions:** Capitalized terms shall have the definition ascribed as such in these General Terms and Conditions and the Chain of Custody.
2. **The Services:** HydroQual will provide the Services to the Client as listed and described in the Chain of Custody.
3. **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 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 yearly basis.
4. **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.
5. **Quotation Numbers:** The Client shall provide the proposal and/or price quotation number to HydroQual (where applicable) to ensure correct pricing.
6. **Taxes:** Applicable taxes are not included in prices, surcharges and additional fees and will be added at the time of invoicing.
7. **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.
8. **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.
9. **Storage:** Where possible, HydroQual will store samples until a final report is issued to the Client, after which time HydroQual may discard the sample.
10. **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.
11. **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.
12. **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.
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 OR 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. #: NOT SUBMITTED
Job Reference: FARUC - WINTER 2014 EMS WEEK 1
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets
Account Manager

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1561564-1 WWTP INFLUENT 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
pH	7.72		0.10	pH		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
pH	8.00		0.10	pH		23-DEC-14	R3127016
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	29.6	DLA	0.10	mg/L		24-DEC-14	R3125702
Nitrate+Nitrite							
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							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-DEC-14	R3126634
Orthophosphate-Dissolved (as P)	<0.005		0.0050	mg/L		24-DEC-14	R3125162
Coliform Bacteria - Fecal	6	OCR	1	CFU/100mL		23-DEC-14	R3125186
Phosphorus (P)-Total	0.0090		0.0050	mg/L		31-DEC-14	R3126756
Total Suspended Solids	<3.0		3.0	mg/L		24-DEC-14	R3125330
pH	8.34		0.10	pH		23-DEC-14	R3127016
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.21		0.020	mg/L		23-DEC-14	R3125033
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.21		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
L1561564-4 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 Matrix: WATER							
pH	8.33		0.10	pH		23-DEC-14	R3127016
NO2, NO3 and Sum of NO2/NO3							
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)	<0.050		0.050	mg/L		30-DEC-14	R3126634
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		24-DEC-14	R3125162
Coliform Bacteria - Fecal	1	OCR	1	CFU/100mL		23-DEC-14	R3125186
Phosphorus (P)-Total	0.0074		0.0050	mg/L		31-DEC-14	R3126756
Total Suspended Solids	<3.0		3.0	mg/L		24-DEC-14	R3125330
pH	8.39		0.10	pH		23-DEC-14	R3127016
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.52		0.020	mg/L		23-DEC-14	R3125033
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.52		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

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
EHR	FCC TEST FOR SAMPLES -2-5 - Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested

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	Test Description	Method Reference**
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	Water	Fecal Coliform Count-MF	APHA 9222B 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-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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



WW



L1561564-COFC

SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY: FER		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:												Ambient 4.5 ^o								
ADDRESS: 1505		CITY: CALGARY		PROV: ALBERTA	POSTAL CODE: T2T 0E2																			
TEL: 1-800-258-7669		FAX: 403-244-3774		SAMPLER: Hungry Baytaluke																				
PROJECT NAME AND NO.: F A R U C - WINTER 2014 EMS week 1		QUOTE NO:																						
PO NO.:		ALS CONTACT: Lydmyla Shvets@ALSGlobal.com														NOTES (sample specific comments, due dates, etc.)								
REPORT FORMAT:		<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmaier@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:																						
WO#	SAMPLE IDENTIFICATION		DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	PH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD									
			YYYY-MM-DD	TIME																				
FOR LAB USE ONLY	1	WWTP Influent Routine	2	2014-12-21	14:00	Water	X	X																temp = 10.8 C
		WWTP Influent BOD	2	2014-12-21	14:00	Water								X										temp = 10.8 C
		WWTP Effluent Routine	3	2014-12-21	14:15	Water	X	X																temp = 12.1 C
		WWTP Effluent BOD	4	2014-12-21	14:15	Water								X										temp = 12.1 C
	2	WWTP Effluent Nutrient	5	2014-12-21	14:15	Water			X	X	X	X	X	X		X								temp = 12.1 C
		WWTP Effluent Bacti	6	2014-12-21	14:15	Water	X																	temp = 12.1 C
		Elkriver Upstream Routine	7	2014-12-21	14:30	Water	X	X																temp = 11.7 C
	3	Elkriver Upstream Nutrient	8	2014-12-21	14:30	Water			X	X	X	X	X	X										temp = 11.7 C
		Elkriver Upstream Bacti	9	2014-12-21	14:30 / 15:45	Water	X																	temp = 11.7 C
		Elkriver Outfall Routine	10	2014-12-21	14:45	Water	X	X																temp = 11.8 C
	4	Elkriver Outfall Nutrient	11	2014-12-21	14:45	Water			X	X	X	X	X	X										temp = 11.8 C
		Elkriver Outfall Bacti	12	2014-12-21	14:45 / 15:00	Water	X																	temp = 11.8 C
		Elkriver downstream Routine	13	2014-12-21	15:00	Water	X	X																temp = 11.9 C
	5	Elkriver downstream Nutrient	14	2014-12-21	15:00	Water			X	X	X	X	X	X										temp = 11.9 C
		Elkriver downstream Bacti	15	2014-12-21	15:00	Water	X																	temp = 11.9 C
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: 12/23/14 (surcharge may apply)		RELINQUISHED BY: HUNGRY BAYTALUKE DATE: 2014-12-21 TIME: 5:00 pm		RECEIVED BY: [Signature] DATE: 12/23/14 TIME: 8:40																		
SEND INVOICE TO:		<input checked="" type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)		RELINQUISHED BY: DATE: TIME:		RECEIVED BY: DATE: TIME:																		
INVOICE FORMAT:		<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX		SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com		FOR LAB USE ONLY																		
		Cooling Method? <input type="checkbox"/> Icepacks <input type="checkbox"/> Ice <input type="checkbox"/> None		Cooler Seal Intact? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Sample Temperature: 10 C Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No																		



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 02-JAN-15
Report Date: 09-JAN-15 12:31 (MT)
Version: FINAL

Client Phone: 403-256-8473

Certificate of Analysis

Lab Work Order #: L1563452
Project P.O. #: NOT SUBMITTED
Job Reference: FERNIE ALPINE RESORT - WINTER 14/15 EMS
WK 2
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
L1563452-1 WWTP INFLUENT Sampled By: BC on 01-JAN-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
pH	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	pH		06-JAN-15	R3128542
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	42.8		0.020	mg/L		02-JAN-15	R3127675
Nitrate+Nitrite							
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							
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
Coliform Bacteria - Fecal	<1		1	CFU/100mL		02-JAN-15	R3127411
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		08-JAN-15	R3129349
Total Suspended Solids	<3.0		3.0	mg/L		05-JAN-15	R3128258
pH	8.37		0.10	pH		06-JAN-15	R3128542
NO2, NO3 and Sum of NO2/NO3							
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							
Nitrite (as N)	<0.010		0.010	mg/L		02-JAN-15	R3127675
L1563452-4 ELK RIVER @ OUTFALL Sampled By: BC on 01-JAN-15 @ 15:05 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

* 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
L1563452-4 ELK RIVER @ OUTFALL Sampled By: BC on 01-JAN-15 @ 15:05 Matrix: WATER							
pH	8.24		0.10	pH		06-JAN-15	R3128542
NO2, NO3 and Sum of NO2/NO3							
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	mg/L		02-JAN-15	R3127675
L1563452-5 ELK RIVER DOWNSTREAM Sampled By: BC on 01-JAN-15 @ 15:15 Matrix: WATER							
Miscellaneous Parameters							
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
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	pH		06-JAN-15	R3128542
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.47		0.020	mg/L		02-JAN-15	R3127675
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	1.47		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

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

Reference Information

Qualifiers for Individual Samples Listed:

Sample Number	Client ID	Qualifier	Description
L1563452-3	ELK RIVER UPSTREAM	SPL	TOTAL P, NH3 - Sample was Preserved at the laboratory

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	Test Description	Method Reference**
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	Water	Fecal Coliform Count-MF	APHA 9222B 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-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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



L1563452-COFC

Vancouver BC, 1988 Triumph Street, V5L 1K5, Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 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
 AB, Bay 1, 245 Macdonald Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 AB, 9936 - 67th Avenue, T6E 0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 Bay 7, 1313 - 44th Avenue NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 BC, 819 - 58th Street East, S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:											
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST															
CITY: CALGARY	PROV: ALBERTA	POSTAL CODE: T2T 0E2													
TEL: 403 - 256 - 8473	FAX: 403 - 244 - 3774	SAMPLER: Bo Choroszewski													
PROJECT NAME AND NO.: Fernie Alpine Resort- Winter 14/15 EMS wk 2		QUOTE NO:													
PO NO.:	ALS CONTACT: Lydmyla Shvets														
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmaier@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:														
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME												
FOR LAB USE ONLY	1	WWTP Influent Routine	1	2015-01-01	15:20	Water	X	X							14°C
		WWTP Influent BOD	2	2015-01-01	15:20	Water							X		14°C
		WWTP Effluent Routine	3	2015-01-01	15:25	Water	X	X							14.5°C
	2	WWTP Effluent BOD	4	2015-01-01	15:25	Water								X	14.5°C
		WWTP Effluent Nutrients	5	2015-01-01	15:25	Water			X	X	X	X	X		14.5°C
		WWTP Effluent Bacteriological	6	2015-01-01	15:25	Water	X								14.5°C
	3	Elk River Upstream Routine	7	2015-01-01	14:55	Water	X	X							-1.0°C
		Elk River Upstream Nutrients	8	2015-01-01	14:55	Water			X	X	X	X	X		-1.0°C Broken
		Elk River Upstream Bacteriological	9	2015-01-01	14:55	Water	X								-1.0°C Broken
	4	Elk River @ Outfall Routine	10	2015-01-01	15:05	Water		X	X						-0.8°C
		Elk River @ Outfall Nutrients	11	2015-01-01	15:05	Water			X	X	X	X	X		-0.8°C
		Elk River @ Outfall Bacteriological	12	2015-01-01	15:05	Water	X								-0.8°C
	5	Elk River Downstream Routine	13	2015-01-01	15:15	Water		X	X						+2.2°C
		Elk River Downstream Nutrients	14	2015-01-01	15:15	Water			X	X	X	X	X		+2.2°C
		Elk River Downstream Bacteriological	15	2015-01-01	15:15	Water	X								+2.2°C
TURN AROUND REQUIRED: <input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)				RELINQUISHED BY: _____ DATE: _____				RECEIVED BY: _____ DATE: Jan 2							
SEND INVOICE TO: <input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)				RELINQUISHED BY: _____ DATE: 2015-01-01				RECEIVED BY: _____ DATE: 10:11 am							
INVOICE FORMAT: <input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX				Bo Choroszewski				TIME: 16:00							
SPECIAL INSTRUCTIONS: PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com				FOR LAB USE ONLY				Cooler Seal Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A Sample Temperature: 7°C Cooling Method? _____							



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 09-JAN-15
Report Date: 16-JAN-15 14:50 (MT)
Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1565537
Project P.O. #: NOT SUBMITTED
Job Reference: FARUC - WINTER 2014 EMS WEEK 3
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
L1565537-1 WWTP INFLUENT Sampled By: HB on 07-JAN-15 @ 14:00 Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	252		2.0	mg/L		09-JAN-15	R3131641
Total Suspended Solids	217		15	mg/L		14-JAN-15	R3132011
pH	7.79		0.10	pH		14-JAN-15	R3131839
L1565537-2 WWTP EFFLUENT Sampled By: HB on 07-JAN-15 @ 14:15 Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		14-JAN-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	mg/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	pH		14-JAN-15	R3131839
NO2, NO3 and Sum of NO2/NO3							
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							
Nitrite (as N)	<0.050	DLA	0.050	mg/L		09-JAN-15	R3130988
L1565537-3 ELKRIVER UPSTREAM Sampled By: HB on 07-JAN-15 @ 14:30 Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/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	0.0073		0.0050	mg/L		15-JAN-15	R3132146
Total Suspended Solids	<3.0		3.0	mg/L		14-JAN-15	R3132011
pH	8.43		0.10	pH		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							
Nitrite (as N)	<0.010		0.010	mg/L		09-JAN-15	R3130988
L1565537-4 ELKRIVER OUTFALL Sampled By: HB on 07-JAN-15 @ 14:45 Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		14-JAN-15	R3131487
Orthophosphate-Dissolved (as P)	0.0702		0.0050	mg/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

* 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
L1565537-4 ELKRIVER OUTFALL Sampled By: HB on 07-JAN-15 @ 14:45 Matrix: WATER							
pH	8.35		0.10	pH		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							
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							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/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	pH		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							
Nitrite (as N)	<0.010		0.010	mg/L		09-JAN-15	R3130988

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
EHR	FCC FOR -2-5 - Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested

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.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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	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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



L1565537-COFC

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11K5, Tel: 804-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700
 Avenue, V1J 6W7, Tel: 250-261-5517 Fax: 250-261-5587
 V5W1, Tel: 780-539-5198 Toll Free: 1-800-668-9878 Fax: 780-513-2191
 Old Cr, T9H 4B5, Tel: 780-791-1524 Fax: 780-791-1586
 E0P5, Tel: 780-413-5227 Toll Free: 1-800-668-9878 Fax: 780-437-2311
 NE, T2E 6L5, Tel: 403-291-9897 Toll Free: 1-800-668-9878 Fax: 403-291-0298
 S7K 6X5, Tel: 306-668-8370 Toll Free: 1-800-667-7645 Fax: 306-668-8383

SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:											
ADDRESS: 1505 - 17TH Avenue South East		<div style="text-align: right; font-size: 2em; font-weight: bold;">Ambient Air Temp = 12.0°C</div>													
CITY: CALGARY	PROV: ALBERTA													POSTAL CODE: T2T 0E2	
TEL: 1-800-258-7669	FAX: 403-244-3774													SAMPLER: Hungry Baytaluke	
PROJECT NAME AND NO.: F A R U C - WINTER 2014 EMS week 3														QUOTE NO:	
PO NO.:	ALS CONTACT: Lydmyla Shvets@ALSglobal.com														
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmajer@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:														
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME												
FOR LAB USE ONLY	1	WWTP Influent Routine	1	2015-1-7	14:00	Water	X	X							temp = 10.8 C
		WWTP Influent BOD	2	2015-1-7	14:00	Water							X		temp = 10.8 C
		WWTP Effluent Routine	3	2015-1-7	14:15	Water	X	X							temp = 13.4 C
	2	WWTP Effluent BOD	4	2015-1-7	14:15	Water							X		temp = 13.4 C
		WWTP Effluent Nutrient	5	2015-1-7	14:15	Water			X	X	X	X	X	X	temp = 13.4 C
		WWTP Effluent Bacti	6	2015-1-7	14:15	Water	X								temp = 13.4 C
	3	Elkriver Upstream Routine	7	2015-1-7	14:30	Water		X	X						temp = -1.8 C
		Elkriver Upstream Nutrient	8	2015-1-7	14:30	Water			X	X	X	X	X		temp = -1.8 C
		Elkriver Upstream Bacti	9	2015-1-7	14:30	Water	X								temp = -1.8 C
		Elkriver Outfall Routine	10	2015-1-7	14:45	Water		X	X						temp = -1.9 C
	4	Elkriver Outfall Nutrient	11	2015-1-7	14:45	Water			X	X	X	X	X		temp = -1.9 C
		Elkriver Outfall Bacti	12	2015-1-7	14:45	Water	X								temp = -1.9 C
		Elkriver downstream Routine	13	2015-1-7	15:00	Water		X	X						temp = -1.8 C
	5	Elkriver downstream Nutrient	14	2015-1-7	15:00	Water			X	X	X	X	X		temp = -1.8 C
		Elkriver downstream Bacti	15	2015-1-7	15:00	Water	X								temp = -1.8 C
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)			RELINQUISHED BY:		DATE: 2015-1-7		RECEIVED BY:		DATE: 9-Jan-15				
SEND INVOICE TO:		<input checked="" type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)			HUNGRY BAYTALUKE		TIME: 5:00 pm		MM		TIME: 10:40				
INVOICE FORMAT:		<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX			RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:				
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com			FOR LAB USE ONLY		Cooler Seal Intact?		Sample Temperature: 7°C		Cooling Method?				
					Yes ___ No ___ N/A		Frozen? ___ Yes ___ No		Icepacks ___ Ice ___ None						



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 15-JAN-15
Report Date: 22-JAN-15 16:13 (MT)
Version: FINAL

Client Phone: 403-256-8473

Certificate of Analysis

Lab Work Order #: L1567408
Project P.O. #: NOT SUBMITTED
Job Reference: FERNIE ALPINE RESORT - WINTER 14/15 EMS
WK 4
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
L1567408-1 WWTP INFLUENT Sampled By: BC on 14-JAN-15 @ 15:10 Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	140		2.0	mg/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
pH	7.84		0.10	pH		15-JAN-15	R3132366
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	39.8		0.020	mg/L		15-JAN-15	R3133148
Nitrate+Nitrite							
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)-Total	0.0220		0.0050	mg/L		21-JAN-15	R3135383
Total Suspended Solids	<3.0		3.0	mg/L		21-JAN-15	R3136368
pH	8.23		0.10	pH		15-JAN-15	R3132366
NO2, NO3 and Sum of NO2/NO3							
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							
Nitrite (as N)	<0.010		0.010	mg/L		15-JAN-15	R3133148
L1567408-4 ELKRIVER DOWNSTREAM Sampled By: BC on 14-JAN-15 @ 14:50 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		15-JAN-15	R3132022
Coliform Bacteria - Fecal	<1		1	CFU/100mL		15-JAN-15	R3132725
Phosphorus (P)-Total	0.0064		0.0050	mg/L		21-JAN-15	R3135383
Total Suspended Solids	3.3		3.0	mg/L		21-JAN-15	R3136368

* 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
L1567408-4 ELKRIVER DOWNSTREAM Sampled By: BC on 14-JAN-15 @ 14:50 Matrix: WATER pH	8.38		0.10	pH		15-JAN-15	R3132366
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	0.787		0.020	mg/L		15-JAN-15	R3133148
Nitrate+Nitrite Nitrate and Nitrite (as N)	0.787		0.050	mg/L		18-JAN-15	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		15-JAN-15	R3133148

* 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.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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	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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



L1567408-COFC

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SEND REPORT TO:

CHAIN OF CUSTODY FORM

PAGE OF

COMPANY: FERNIE ALPINE RESORT UTILITIES CORPORATION		ATTN: PATRICK MAJER		ANALYSIS REQUESTED:											
ADDRESS: 1505 - 17TH AVENUE SOUTH WEST															
CITY: CALGARY	PROV: ALBERTA	POSTAL CODE: T2T 0E2													
TEL: 403 - 256 - 8473	FAX: 403 - 244 - 3774	SAMPLER: Bo Choroszewski													
PROJECT NAME AND NO.: Fernie Alpine Resort- Winter 14/15 EMS wk 4		QUOTE NO:													
PO NO.:	ALS CONTACT: Lyomyla Shvets														
REPORT FORMAT:	<input checked="" type="checkbox"/> HARDCOPY <input checked="" type="checkbox"/> EMAIL - ADDRESS: pmaier@skircr.com <input type="checkbox"/> FAX <input type="checkbox"/> EXCEL <input checked="" type="checkbox"/> PDF <input type="checkbox"/> OTHER:														
WO#	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED		MATRIX	Fecal Coliforms	TSS	pH	Ortho P	Total P	NH3-N	NO3-N	NO2-N	BOD5	COD	NOTES (sample specific comments, due dates, etc.)
		YYYY-MM-DD	TIME												
FOR LAB USE ONLY	1	WWTP Influent Routine	2015-01-14	15:10	Water		X	X							10.4°C
		WWTP Influent BOD	2015-01-14	15:10	Water								X		10.4°C
		WWTP Effluent Routine	2015-01-14	15:15	Water		X	X						X	13.5°C
	2	WWTP Effluent BOD	2015-01-14	15:15	Water								X		13.5°C
		WWTP Effluent Nutrients	2015-01-14	15:15	Water				X	X	X	X	X		13.5°C
		WWTP Effluent Bacteriological	2015-01-14	15:15	Water	X									13.5°C
		Elk River Upstream Routine	2015-01-14		Water		X	X							ICE SHELF
		Elk River Upstream Nutrients	2015-01-14		Water				X	X	X	X	X		ICE SHELF
		Elk River Upstream Bacteriological	2015-01-14		Water	X									ICE SHELF
	3	Elk River @ Outfall Routine	2015-01-14	14:55	Water		X	X							0.6°C
		Elk River @ Outfall Nutrients	2015-01-14	14:55	Water				X	X	X	X	X		0.6°C
		Elk River @ Outfall Bacteriological	2015-01-14	14:55	Water	X									0.6°C
	4	Elk River Downstream Routine	2015-01-14	14:50	Water		X	X							-0.7°C
		Elk River Downstream Nutrients	2015-01-14	14:50	Water				X	X	X	X	X		-0.7°C
		Elk River Downstream Bacteriological	2015-01-14	14:50	Water	X									-0.7°C
TURN AROUND REQUIRED:		<input checked="" type="radio"/> ROUTINE <input type="radio"/> RUSH SPECIFY DATE: _____ (surcharge may apply)		RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:		15/Jan			
SEND INVOICE TO:		<input type="checkbox"/> SAME AS REPORT <input type="checkbox"/> DIFFERENT FROM REPORT (provide details below)		RELINQUISHED BY:		DATE: 2015-01-14		RECEIVED BY: MK		DATE:		9:54			
INVOICE FORMAT:		<input type="checkbox"/> HARDCOPY <input type="checkbox"/> PDF <input type="checkbox"/> FAX		Bo Choroszewski		TIME: 16:00				TIME:					
SPECIAL INSTRUCTIONS:		PLEASE FAX A COPY OF THE RESULTS TO 250-423-4652 OR E-MAIL TO wastewater@skifernie.com		FOR LAB USE ONLY											
				Cooler Seal Intact?		Sample Temperature: 1°C		Cooling Method?							
				Yes No N/A		Frozen? Yes No		Icepacks Ice None							



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 22-JAN-15
Report Date: 29-JAN-15 12:34 (MT)
Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1569971
Project P.O. #: NOT SUBMITTED
Job Reference: FARUC - WINTER 2014 EMS WEEK 5
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets
Account Manager

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1569971-1 WWTP INFLUENT Sampled By: HB on 21-JAN-15 @ 14:00 Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	161		2.0	mg/L		23-JAN-15	R3139950
Total Suspended Solids	175		5.0	mg/L		22-JAN-15	R3137427
pH	8.16		0.10	pH		22-JAN-15	R3137228
L1569971-2 WWTP EFFLUENT Sampled By: HB on 21-JAN-15 @ 14:15 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		23-JAN-15	R3139950
Chemical Oxygen Demand	20		10	mg/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	mg/L		22-JAN-15	R3137427
pH	7.91		0.10	pH		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							
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	mg/L		22-JAN-15	R3137882
L1569971-3 ELKRIVER UPSTREAM Sampled By: HB on 21-JAN-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
pH	8.44		0.10	pH		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							
Nitrate and Nitrite (as N)	1.91		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
L1569971-4 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

* 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
L1569971-4 ELKRIVER OUTFALL Sampled By: HB on 21-JAN-15 @ 14:45 Matrix: WATER							
pH	8.34		0.10	pH		22-JAN-15	R3137228
NO2, NO3 and Sum of NO2/NO3							
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	mg/L		23-JAN-15	
Nitrite in Water by IC							
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							
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	0.0063		0.0050	mg/L		27-JAN-15	R3139439
Total Suspended Solids	<3.0		3.0	mg/L		22-JAN-15	R3137427
pH	8.47		0.10	pH		22-JAN-15	R3137228
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.94		0.020	mg/L		22-JAN-15	R3137882
Nitrate+Nitrite							
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

* 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

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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	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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.



FERNIE ALPINE RESORT UTILITIES
CORPORATION
ATTN: PATRICK MAJER
1505 - 17TH AVENUE SW
CALGARY AB T2T 0E2

Date Received: 29-JAN-15
Report Date: 05-FEB-15 13:56 (MT)
Version: FINAL

Client Phone: 403-254-7669

Certificate of Analysis

Lab Work Order #: L1572425
Project P.O. #: NOT SUBMITTED
Job Reference: FARUC - WINTER 2014 EMS WEEK 6
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets
Account Manager

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1572425-1 WWTP INFLUENT Sampled By: HUNGRY BAYTALUKE on 28-JAN-15 @ 14:00 Matrix: WATER							
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
pH	8.10		0.10	pH		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
pH	8.14		0.10	pH		29-JAN-15	R3141161
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	22.1		0.020	mg/L		29-JAN-15	R3142497
Nitrate+Nitrite							
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)-Total	0.0173		0.0050	mg/L		03-FEB-15	R3142726
Total Suspended Solids	<3.0		3.0	mg/L		01-FEB-15	R3142169
pH	8.41		0.10	pH		29-JAN-15	R3141161
NO2, NO3 and Sum of NO2/NO3							
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							
Nitrite (as N)	<0.010		0.010	mg/L		29-JAN-15	R3142497
L1572425-4 ELK RIVER OUTFALL Sampled By: HUNGRY BAYTALUKE on 28-JAN-15 @ 14:45 Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		30-JAN-15	R3141260
Orthophosphate-Dissolved (as P)	0.0088		0.0050	mg/L		30-JAN-15	R3141202
Coliform Bacteria - Fecal	1	OCR	1	CFU/100mL		29-JAN-15	R3141422
Phosphorus (P)-Total	0.0133		0.0050	mg/L		03-FEB-15	R3142726
Total Suspended Solids	<3.0		3.0	mg/L		01-FEB-15	R3142169

* 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
L1572425-4 ELK RIVER OUTFALL Sampled By: HUNGRY BAYTALUKE on 28-JAN-15 @ 14:45 Matrix: WATER							
pH	8.40		0.10	pH		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							
Nitrate and Nitrite (as N)	0.320		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
L1572425-5 ELK RIVER DOWNSTREAM Sampled By: HUNGRY BAYTALUKE on 28-JAN-15 @ 15:00 Matrix: WATER							
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
Phosphorus (P)-Total	0.0068		0.0050	mg/L		03-FEB-15	R3142726
Total Suspended Solids	<3.0		3.0	mg/L		01-FEB-15	R3142169
pH	8.47		0.10	pH		29-JAN-15	R3141161
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	1.59		0.020	mg/L		29-JAN-15	R3142497
Nitrate+Nitrite							
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

* 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-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	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 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	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-CL	Water	pH	APHA 4500 H-Electrode
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:

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.

CERTIFICATE OF INSURANCE

BROKER
Toole Peet & Co. Limited
 P.O. Box 4650 Station C
 1135 - 17th Avenue SW
 Calgary, AB T2T 5R5
 BROKER'S CLIENT ID:

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.

COMPANIES AFFORDING COVERAGE

INSURED'S FULL NAME AND MAILING ADDRESS

Environmental Diagnostics Inc.
#140, 5050 - 106 Ave. SE
Calgary, AB T2C 5E9

COMPANY A	Aviva Insurance
COMPANY B	Certain Underwriters at Lloyds as under contract MKL2016001 (Markel Syndicate 3000)
COMPANY C	Certain Authorized Underwriters as arranged through Encon Group Inc.
COMPANY D	

COVERAGES

This is to certify that the policies of insurance listed below have been issued to the insured named above for the policy period indicated, notwithstanding any requirement, term or condition of any contract or other document with respect to which this certificate may be issued or may pertain. The insurance afforded by the policies described herein is subject to all the terms, exclusions and conditions of such policies.

LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS

TYPE OF INSURANCE	CO LTR	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS OF LIABILITY																		
COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE OR <input checked="" type="checkbox"/> OCCURRENCE <input checked="" type="checkbox"/> PRODUCTS AND / OR COMPLETED OPERATIONS <input type="checkbox"/> EMPLOYERS' LIABILITY <input checked="" type="checkbox"/> CROSS LIABILITY <input checked="" type="checkbox"/> TENANT'S LIABILITY <input checked="" type="checkbox"/> NON-OWNED AUTOMOBILES <input type="checkbox"/> <input checked="" type="checkbox"/> HIRED <input type="checkbox"/> POLLUTION LIABILITY EXTENSION <input checked="" type="checkbox"/> CONTRACTUAL LIABILITY	A	81229768	3/30/2016	3/30/2017	<table style="width: 100%; border-collapse: collapse;"> <tr><td>EACH OCCURRENCE</td><td style="text-align: right;">\$ 2,000,000</td></tr> <tr><td>GENERAL AGGREGATE</td><td style="text-align: right;">\$ 5,000,000</td></tr> <tr><td>PRODUCTS - Comp/Ops Agg.</td><td style="text-align: right;">\$ 2,000,000</td></tr> <tr><td>PERSONAL INJURY</td><td style="text-align: right;">\$ 2,000,000</td></tr> <tr><td>TENANT'S LEGAL LIABILITY</td><td style="text-align: right;">\$ 250,000</td></tr> <tr><td>MED EXP (any one person)</td><td style="text-align: right;">\$ 10,000</td></tr> <tr><td>NON-OWNED AUTO</td><td style="text-align: right;">\$ 2,000,000</td></tr> <tr><td>OPTIONAL POLLUTION LIABILITY EXTENSION</td><td style="text-align: right;">\$</td></tr> <tr><td>(Per Occurrence/Aggregate)</td><td style="text-align: right;">\$</td></tr> </table>	EACH OCCURRENCE	\$ 2,000,000	GENERAL AGGREGATE	\$ 5,000,000	PRODUCTS - Comp/Ops Agg.	\$ 2,000,000	PERSONAL INJURY	\$ 2,000,000	TENANT'S LEGAL LIABILITY	\$ 250,000	MED EXP (any one person)	\$ 10,000	NON-OWNED AUTO	\$ 2,000,000	OPTIONAL POLLUTION LIABILITY EXTENSION	\$	(Per Occurrence/Aggregate)	\$
EACH OCCURRENCE	\$ 2,000,000																						
GENERAL AGGREGATE	\$ 5,000,000																						
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NON-OWNED AUTO	\$ 2,000,000																						
OPTIONAL POLLUTION LIABILITY EXTENSION	\$																						
(Per Occurrence/Aggregate)	\$																						
AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> DESCRIBED AUTOMOBILES <input type="checkbox"/> ALL OWNED AUTOMOBILES <input type="checkbox"/> LEASED AUTOMOBILES **ALL AUTOMOBILES LEASED IN EXCESS OF 30 DAYS WHERE THE INSURED IS REQUIRED TO PROVIDE INSURANCE	A	6141184202	9/18/2015	9/18/2016	<table style="width: 100%; border-collapse: collapse;"> <tr><td>BODILY INJURY PROPERTY DAMAGE COMBINED</td><td style="text-align: right;">\$ 2,000,000</td></tr> <tr><td>BODILY INJURY (Per Person)</td><td style="text-align: right;">\$</td></tr> <tr><td>BODILY INJURY (Per Accident)</td><td style="text-align: right;">\$</td></tr> <tr><td>PROPERTY DAMAGE</td><td style="text-align: right;">\$</td></tr> </table>	BODILY INJURY PROPERTY DAMAGE COMBINED	\$ 2,000,000	BODILY INJURY (Per Person)	\$	BODILY INJURY (Per Accident)	\$	PROPERTY DAMAGE	\$										
BODILY INJURY PROPERTY DAMAGE COMBINED	\$ 2,000,000																						
BODILY INJURY (Per Person)	\$																						
BODILY INJURY (Per Accident)	\$																						
PROPERTY DAMAGE	\$																						
EXCESS LIABILITY <input type="checkbox"/> UMBRELLA FORM <input type="checkbox"/> OTHER THAN UMBRELLA FORM (Specify)					<table style="width: 100%; border-collapse: collapse;"> <tr><td></td><td style="text-align: right;">\$</td></tr> <tr><td></td><td style="text-align: right;">\$</td></tr> </table>		\$		\$														
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	\$																						
OTHER LIABILITY (SPECIFY) <input checked="" type="checkbox"/> PROFESSIONAL - ERRORS & OMISSIONS LIABILITY (Claims Made) <input checked="" type="checkbox"/> ENVIRONMENTAL IMPAIRMENT LIABILITY (Claims Made)	C	SRD450628	4/20/2016	4/20/2017	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Per Loss Limit</td><td style="text-align: right;">\$ 2,000,000</td></tr> <tr><td>Per Policy Period</td><td style="text-align: right;">\$ 2,000,000</td></tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Each Claim</td><td style="text-align: right;">\$ 1,000,000</td></tr> <tr><td>Aggregate for Each Policy Period</td><td style="text-align: right;">\$ 1,000,000</td></tr> </table>	Per Loss Limit	\$ 2,000,000	Per Policy Period	\$ 2,000,000	Each Claim	\$ 1,000,000	Aggregate for Each Policy Period	\$ 1,000,000										
Per Loss Limit	\$ 2,000,000																						
Per Policy Period	\$ 2,000,000																						
Each Claim	\$ 1,000,000																						
Aggregate for Each Policy Period	\$ 1,000,000																						
ADDITIONAL INSURED					DESCRIPTION OF OPERATIONS, LOCATIONS/ AUTOMOBILES/ SPECIAL ITEMS Environmental Consultants																		

CERTIFICATE HOLDER	7	CANCELLATION
To Whom It May Concern		Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will endeavor to mail 0 days written notice to the certificate holder named to the left, but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives
0 0 0 0		

SIGNATURE OF AUTHORIZED REPRESENTATIVE <i>Marguerite (Dee) Biederman</i>	FAX NUMBER (403) 228-0231	EMAIL ADDRESS dbiederman@toolepeet.com
PRINT NAME INCLUDING POSITION HELD Marguerite (Dee) Biederman, Account Manager	COMPANY Toole Peet & Co. Limited	DATE 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, Alluving/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
 - 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
 - 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
 - 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
 - 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, book-keeping 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 aermol) 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 undertaken 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.

