ENVIRONMENTAL DIAGNOSTICS INC.

2017 SEWAGE TREATMENT PLANT ANNUAL REPORT

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1.0 INTRODUCTION

1.1 BACKGROUND

The following annual report for the Wastewater Treatment Plant at Kicking Horse Mountain Resort (KHMR) operated by Kicking Horse Mountain Utility Corporation (KHMUC) is compiled in accordance with the requirements of the Municipal Sewage Regulation (MSR). This report summarizes the calendar year 2017.

In January 2012 Resorts of the Canadian Rockies (RCR) took over the resort and the plant operations and formed KHMUC. KHMUC has made changes to the way the plant operates, mainly by using a spare tank as an equalization tank. There has been a noticeable difference in plant operations since RCR took over and KHMUC was formed.

The resort is an ongoing development currently consisting of a combination of a single family, multi-family, and rental pool/hotel style facilities. These contribute to the total loading of the site in addition to ski hill use and ancillary services.

1.2 RESORT CONSTRUCTION AND OCCUPANCY

Kicking Horse Mountain Resort is located approximately 13 km from Golden. The sewage treatment plant, which was constructed in 2000, is located adjacent to the resort. The treatment USBF (upflow sludge blanket filtration) technology employed is a modified conventional activated sludge process applying an up-flow sludge blanket filtration clarifier. There are two independent treatment trains that are operated in parallel during the peak season (December to April) and as a single train during the rest of the calendar year.

The system incorporates two treatment zones and one clarification zone that are interconnected with the flow been driven by the hydraulic pressure from the influent storage tank pumps.

The two treatment zones consist of an Anoxic Zone and Aeration Zone discharging into an effluent clarifier.

Each zone is triangular in shape. Two 10” underflow pipes on either side of the clarification zone join in the anoxic and aeration zones together. The aeration zone is connected to the clarifier by a slotted flow trough, approximately 18” above the clarifier bottom and the width of the clarifier wall. Each zone is approximately 15’ deep. Effluent clarification is enhanced by an up-flow sludge blanket in the clarifier that serves to filter the solids.

Clarified effluent flows over the clarifier weir into a dual micro filtration well, equipped with dual drum screens. Leaving the drum screens, the final effluent enters an open channel Trojan U.V. disinfection system to be discharged through a 4 km long gravity main to the outfall in the Columbia River.

Waste activated sludge used to be stored in a thickener and removed by vacuum tanker. In the fall of 2014, a 12 unit Teknofanghi (Model Number 12BCAVPK) supplied by Drycake was installed and was commissioned in mid December. Historically, the sludge was bagged and disposed of at the CSRD Landfill located in Golden, BC; however, due to increased costs for dumping, the sludge from 2017 season is being stored on site until a new disposal location is determined.

2.0 REGISTRATION REQUIREMENTS

This section describes operating requirements as specified in the Kicking Horse Mountain Resort (KHMR) Registration Letter RE 15474. 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
Enterococci	Bacterial concentration, measured as colony forming units per 100ml
E. Coli	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	300	m^3/d
BOD_5	45	mg/l
TSS	45	mg/l
Total-P	1.0	mg/l
Ortho-P	0.5	mg/l
Fecal Coliforms*	200	CFU/100ml
E. Coli*	77	CFU/100ml
Enterococci*	20	CFU/100ml
Toxicity Bioassay	pass	n/a

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

Waste activated sludge used to be stored in a thickener and removed by a vacuum tanker. In the fall of 2014, a 12 unit Teknofanghi (Model Number 12BCAVPK) supplied by Drycake was installed and was commissioned in mid December. The sludge was bagged and disposed of at the CSRD landfill located in Golden, BC.

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.

In addition the report must also include the following:

- Tabulated results of the Effluent and Environmental Monitoring Data with standards and criteria
- Interpretation of the monitoring data
- The total volume discharged over the year
- Total sludge wasted over the year and its final destination
- The state of compliance of the treatment facility/process
- Indicated the percentage of residential development, as defined in the regulation, that contributes to the effluent discharge
- Any additional relevant information the discharger wishes to provide

2.4 SAMPLING FREQUENCY

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

Columbia River testing requires that a minimum of 10 samples annually are taken from each of the upstream, the side channel and downstream river locations, relative to the outfall diffuser. The sampling locations were identified in Masse & Miller Consulting Ltd. in their letter dated February 17th, 2005. Flow data is to be collected continuously.

The intent of the environmental testing procedure outlined in Table 2 is to collect weekly samples of effluent during the summer and winter seasons. Commencement of the winter weekly seasonal sampling (weekly samples for a period of 5 weeks) is when the river sampling sites open up and the summer monitoring usually commences during low water flow in the river, usually in September or October.

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				
	Columbia River Upstream at Bridge	**Columbia River ~200 d/s of outfall from east shore**	**Columbia River d/s of island from west shore ~1km d/s of outfall**	**Columbia River side channel ~350m d/s of outfall**	**Effluent**
EMS Number	E256694	E258898	E258899	E258897	E256696
	Winter/Summer	Winter/Summer	Winter	Summer	Winter/Summer
pH	WS/G	WS/G	WS/G	WS/G	W
Temp	WS/G	WS/G	WS/G	WS/G	W
Flow	/	/	/	/	W
BOD_5	/	/	/	/	W
TSS	WS/G	WS/G	WS/G	WS/G	WS/G+Q/G
NH_3-N	WS/G	WS/G	WS/G	WS/G	WS/G
NO_3-N	WS/G	WS/G	WS/G	WS/G	WS/G
NO_2-N	WS/G	WS/G	WS/G	WS/G	WS/G
Total-P	WS/G	WS/G	WS/G	WS/G	WS/G
Ortho-P	WS/G	WS/G	WS/G	WS/G	WS/G
Fecal Coliform	WS/G	WS/G	WS/G	WS/G	WS/G+Q/G
Enterococci	WS/G	WS/G	WS/G	WS/G	WS/G
E. Coli	WS/G	WS/G	WS/G	WS/G	WS/G
Toxicity Bioassay	/	/	/	/	1/3Y/G
Coordinates	11.500456 5684421	11.500288 5684880	N51 19.364 W 11700.218	11.500126 5684835	At sewage treatment plant

Where:

WS	Weekly seasonal (weekly samples for a period of 5 weeks)
Q	Quarterly
W	Weekly
G	Grab
1/3Y	Once every 3 years

3.0 SEWAGE FLOW RECORDS

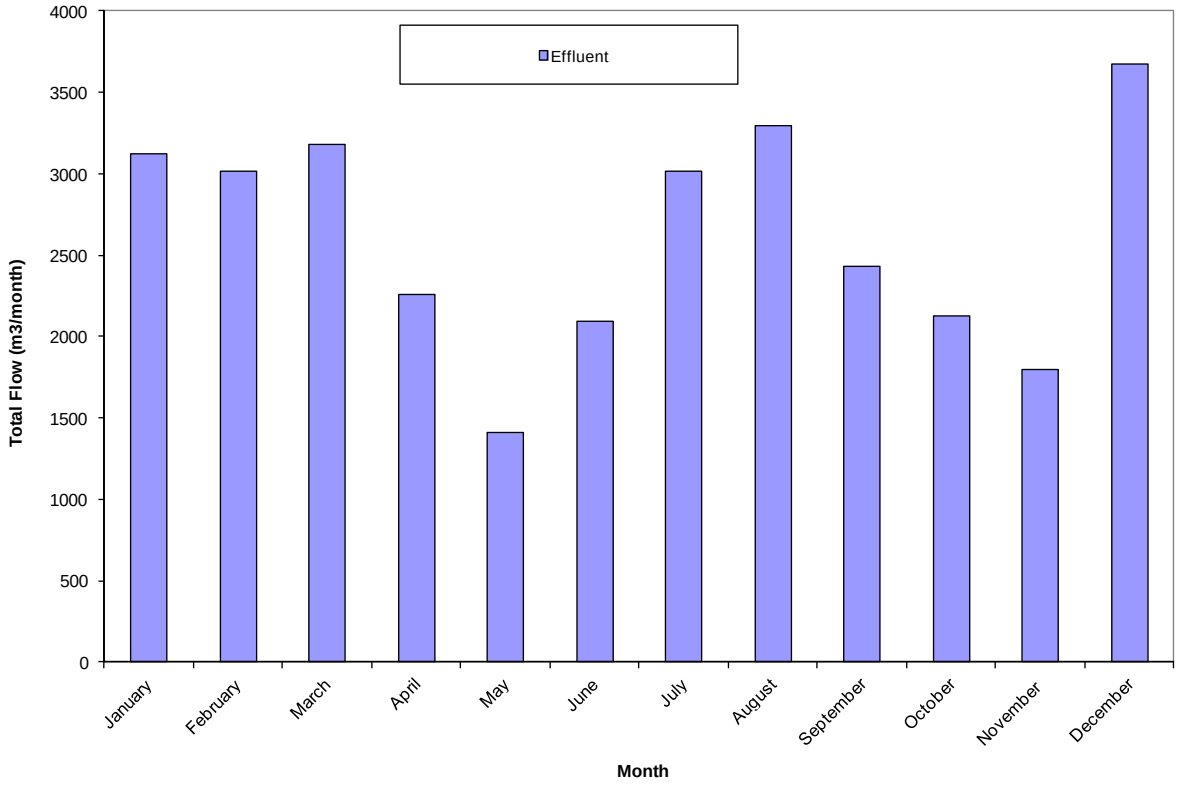
This section provides data and analysis regarding plant effluent flows, and compares 2017 data to the previous years.

Flow data is continuously monitored at the discharge to the outfall using a flow meter to be recorded in the SCADA system. Operators then transcribe the daily flows into a logbook. Please note, the flow meter was not working properly from July 24th until September 7th.

The total effluent flow recorded for 2017 was 31,431.05 m^3 with an average of 85.9 m^3/day. Available monthly total effluent flow meter records for 2017 are provided in Figure 1.

Figure 1

Effluent Flow Meter Monthly Flow Totals



The ski resort operates with higher winter and late spring sewage flows than during any other period. Larger sewage flows are typically observed during January, February, March, April and December. The average daily plant flow through January to April and December of 2017 was 100.96 m^3/day compared to 65.52 m^3/day over the same period in 2016, 81.79 m^3/day in 2015, 74.10 m^3/day in 2014, 47.73 m^3/day in 2013, 72.41 m^3/day in 2012, 165.2 m^3/day in 2011 (note that data for Dec was missing) and 108.5 m^3/day in 2010. Peak flow for the year reached 244 m^3/day, which is well below the allowable limit of 300 m^3/day limit. The peak flow is slightly higher than previous years which were 162.25 m^3/day in 2016, 137.32 m^3/day in 2015, 145.71 m^3/day in 2014,165.03 m^3/day in 2013, 159.05 m^3/day in 2012, 311.54 m^3/day in 2011 (again note that the data for one of the historically highest months, December was missing), 317.6 m^3/day in 2010 and 251.3 m^3/day in 2009. The peak flow day occurred during the heavy ski season, which is to be expected.

There is currently no method of measuring influent to the treatment plant.

A summary of sewage flow for years 2009 through 2017 is provided in Table 3 and Figures 2 and 3:

Table 3

2009 – 2017 Flow Comparisons

Year	Sewage Flow (m^3/day)			Days Over Limit
	Total	Average	Peak	
2009	25,093.9	69.4	251.3	0
2010	27,467.5	77.6	317.6	2
2011	27,771* (42,340)[1]	116	311.54**	2
2012	17,323.4	47.85	159.05	0
2013	16,089	44.73	165.03	0
2014	19,279[2]	52.88	145.71	0
2015	20,594	56.4	167.32	0
2016	21,125	58.9	162.25	0
2017	31,431[3]	85.9	240	0

*not including all of September, October, November or December
**the number does not reflect a true peak as all the data was not available during the high flow months
[1] (data) in bracket – estimate based on daily average
[2] The SCADA failed to record flow for the entire day on several occasions; therefore flow was estimated on partial data
[3] The SCADA failed to record correct flow from July 24th until September 7th; therefore flow was based on partial estimates

2009 - 2016

Peak flows in **2009** coincided with the weekends, holidays, ski season and summer recreational activities. The highest daily flow was recorded on Feb 15th at 215.1 m^3/day and on December 31st at 251.3 m^3/day. At no time was the maximum allowed daily flow exceeded.

Peak flows in **2010** coincided with weekends, holidays, ski season and summer recreational activities. The highest daily flow was recorded on New Year's Day at 242.7 m^3/day, February 14th at 206.4 m^3/day, and on December 31st at 317.6 m^3/day. During the third week of July 2010 a lightning strike damaged the level sensors in the wastewater treatment plant resulting in inaccurate measurement of flows. The Ministry of Environment was notified. The operators indicated that during daily monitoring of the system, there was no time when the flows came close to exceeding the permit based on visual observation and process control monitoring.

Peak flows in **2011** also coincided with weekends, holidays, ski season and summer recreational activities. The highest daily flow was recorded on a weekend (March 26th) at 311.54 m^3/day and the second highest peak was observed on New Year's Day at 303.04 m^3/day. The daily flow limit was exceeded on both occasions. Please note the data was incomplete for September, October, November and December 2011.

Peak flows in **2012** also coincided with the peak season in January, February, March and December. There were no daily flow limit exceedances observed in 2012. The reduction in daily flows and reduction in peak flow is due to flow equalization which has now been implemented in the facility using the vacant tank that will one day be used for additional process trains. Flow equalization began in January 2012.

Peak flows in **2013** also coincided with the peak season in January, February, March and December. There were no daily flow limit exceedances observed in 2013. The highest daily flow was recorded on December 29th at 165.03 m^3/day.

Peak flows in **2014** coincided with the peak season in January, February, March and December. There were no daily flow limit exceedances observed in 2014. The highest daily flow was recorded on January 2nd at 145.71 m^3/day. The SCADA failed to record flow for the entire day on several occasions and partial data was used to estimate total flow. The failure was due to computer issues.

On January 9, 24, 25; February 4; March 3, 28, 29; May 23 to June 2, June 9, 14, 15, 23, 27; July 4, 6-10, 12, 13, 28; August 12, 13, 16, 17; September 5, 6; October 1, 3; November 21, 22, 25, 26; and December 7, 8, and 9 the flow was estimated.

Peak flows in **2015** coincided with the peak season in January, February, March and December. There were no daily flow limit exceedances observed in 2015. The highest daily flow was recorded on January 2nd at 167.32 m^3/day.

Peak flows in **2016** coincided with the peak season in January, February, March and December. There were no daily flow limit exceedances observed in 2016. The highest daily flow was recorded on December 29th at 162.25 m^3/day.

2017

Peak flows in 2017 coincided with the peak season in January, February, March and December. There were no daily flow limit exceedances observed in 2017. The highest daily flow was recorded on December 29th at 244 m^3/day. Please note that the SCADA failed to record correct flow from July 24th until September 7th; therefore flow was based on partial estimates.

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).

There are approximately 30 full time year round residents at the resort. In total, there are currently three lodges, three condominiums and 175 family residences. The breakdown is as follows:

Condos
- 3 Properties
- 155 rental units
- 310 rental rooms
- 952 Bed units

Lodge's
- 3 properties
- 30 rental rooms
- 296 Bed units

Family residences (both single and multi-family)
- 175 properties
- 504 rooms
- 1006 Bed units

Figure 2 provides monthly average and peak day sewage flows for January to December 2017.

Figure 2

Average and Peak Sewage Effluent Flow Comparison Graph

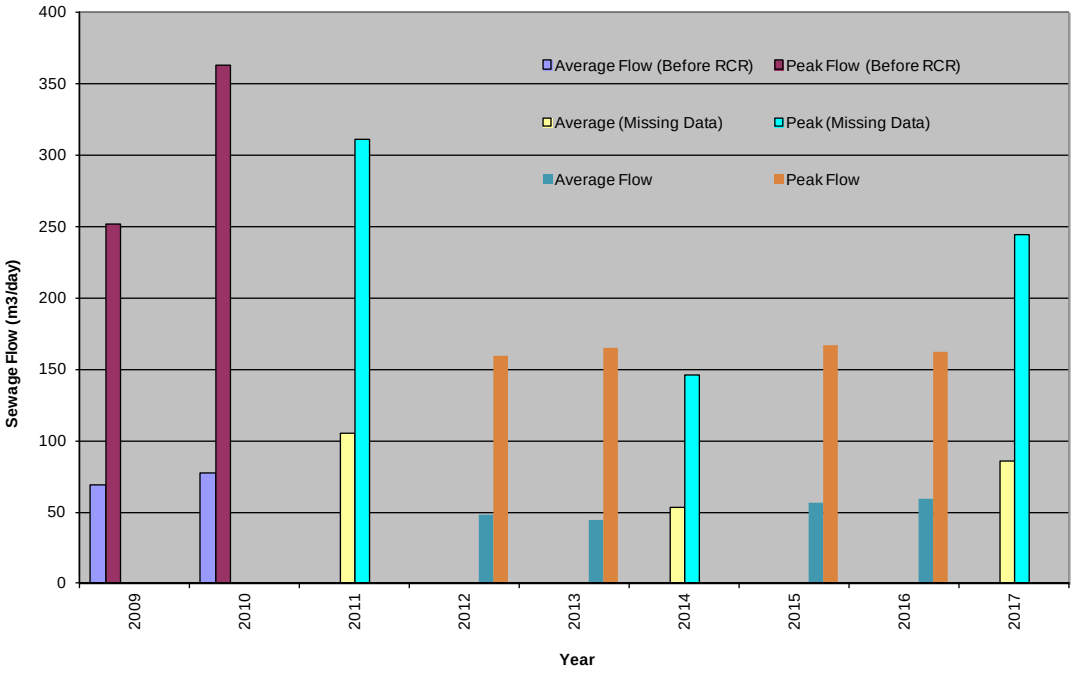


Figure 3

Total Sewage Effluent Flow Graph:

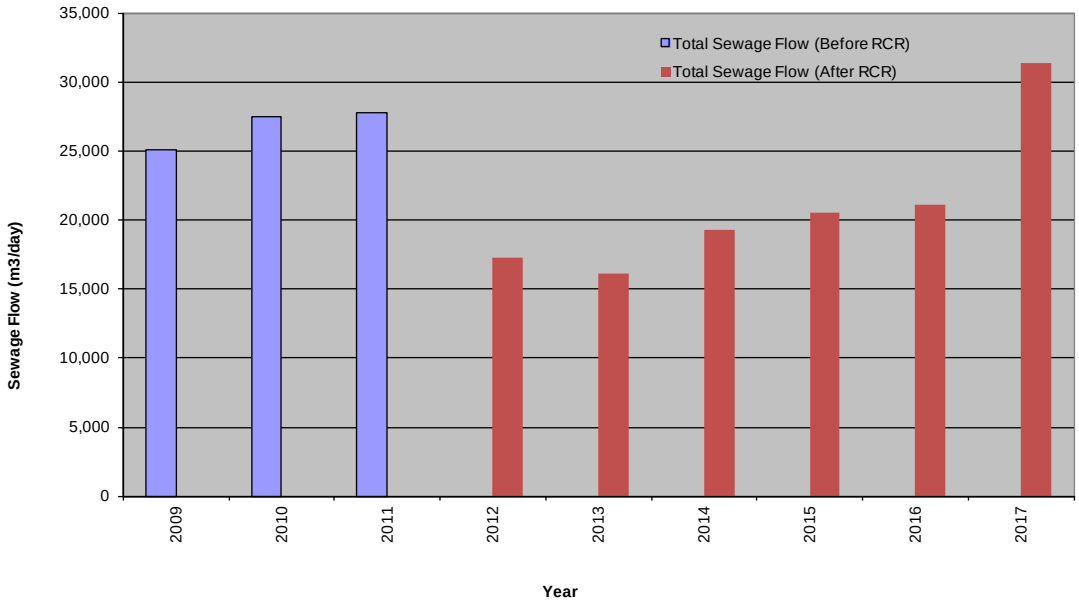
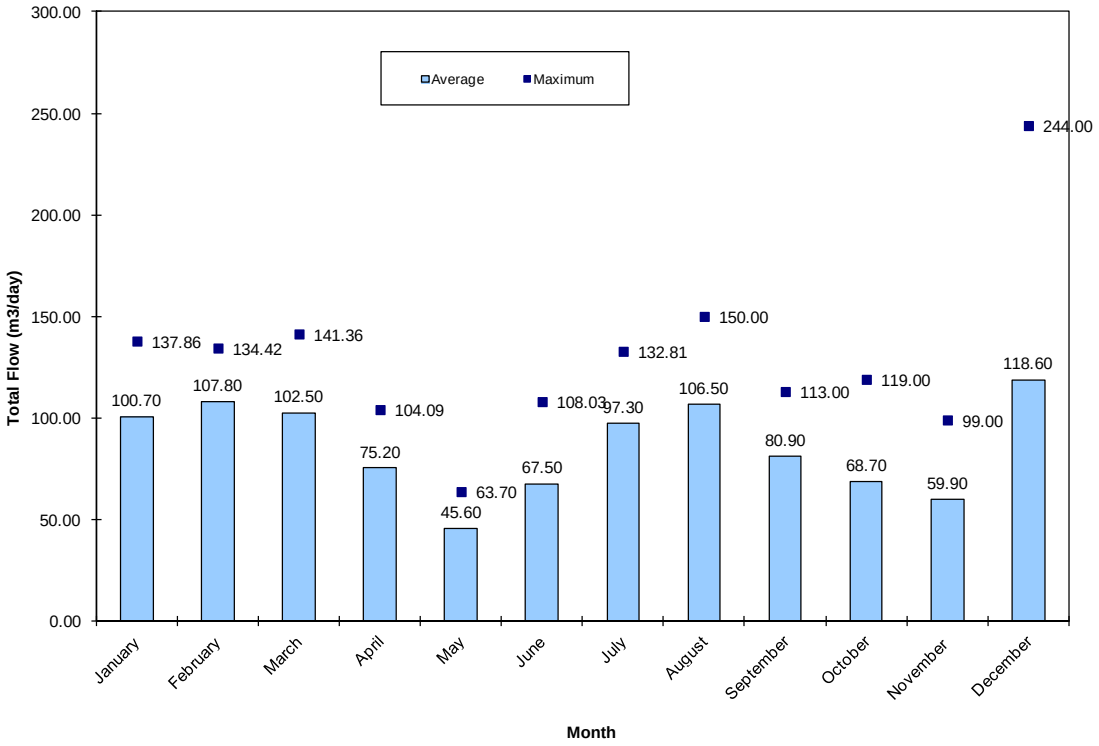


Figure 4

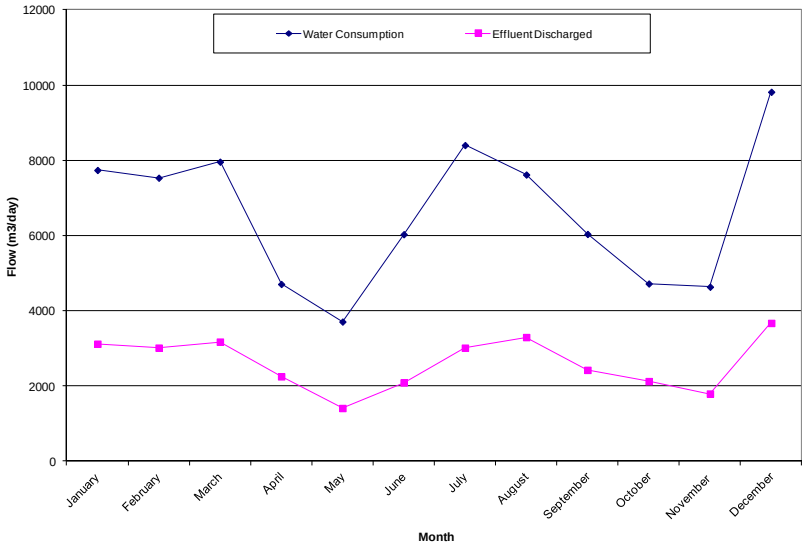
2017 Sewage Effluent Average and Peak Flows by Month



This year, the total effluent discharged was equal to 39.8% of the total water production. Water usage at the hill is compared to the amount of effluent discharged at the WWTP in Figure 5.

Figure 5

2017 Water Consumption and Sewage Effluent Generation



4.0 SEWAGE FLOW PROJECTION

This section shows projected wastewater flow for 2011 through 2017 based on current development plans and provides an estimate of remaining plant capacity.

Based on unit generation rates provided in the BC Health Act for various lodging types as well as the assumption that wastewater generation would have been similar in 2011 to that calculated in 2015, the estimated highest day wastewater generation for 2011 would have been 705.5 m^3/day. Using the actual peak flow of 312 m^3/day, a correction factor of 0.44 was calculated. Averaged correction factor for the last five years (2012, 2013, 2014, 2015 and 2016) was also calculated and multiplied by the future estimated flows to more accurately reflect potential resort sewage generation rates. In 2011, 2012, 2013, 2014, 2015 and 2016 the correction factors were 0.44, 0.22, 0.23, 0.21, 0.24 and 0.26 respectively. The correction factor was 0.27 in 2017.

Projected daily peak wastewater flows from 2011 by year were provided in Table 4 for the Resort's planned expansions. The highest water generation for 2011, 2012, 2013, 2014, 2015, 2016, 2017 and 2018 was calculated based on the BC Health Act (refer to Table 10 enclosed at the end of this report). The future flows will be re-evaluated as 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. KHMUC will monitor sewage flows to determine the efficiency of the program.

Even with additional expansion, KHMUC may not require an increase to permit discharge above the current limit of 300 m^3/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 2017 flow data, the plant has an unused capacity of 56 m^3/day (based on an operating limit of 300 m^3/day) due to the flow saving measures. This still needs to be closely monitored during 2018 and further considered when adding additional development.

Table 4
Projected Peak Flows: 2011-2018

	2011	**2012**	**2013**	**2014**
Estimated Wastewater Flow (m^3/day)	705.5*	705.5*	705.5*	705.5
Actual and Corrected (m^3/day)	312** (a)	159 (a)	165 (a)	146 (a)

	2015	**2016**	**2017**	**2018**
Estimated Wastewater Flow (m^3/day)	705.5	705.5	705.5	705.5
Actual and Corrected (m^3/day)	167 (a)	162 (a)	244 (a)	190 (b)

*the number was calculated based on 2014 occupancy, which is likely overestimated
**the number does not reflect a true peak as all the data was not available during the high flow months

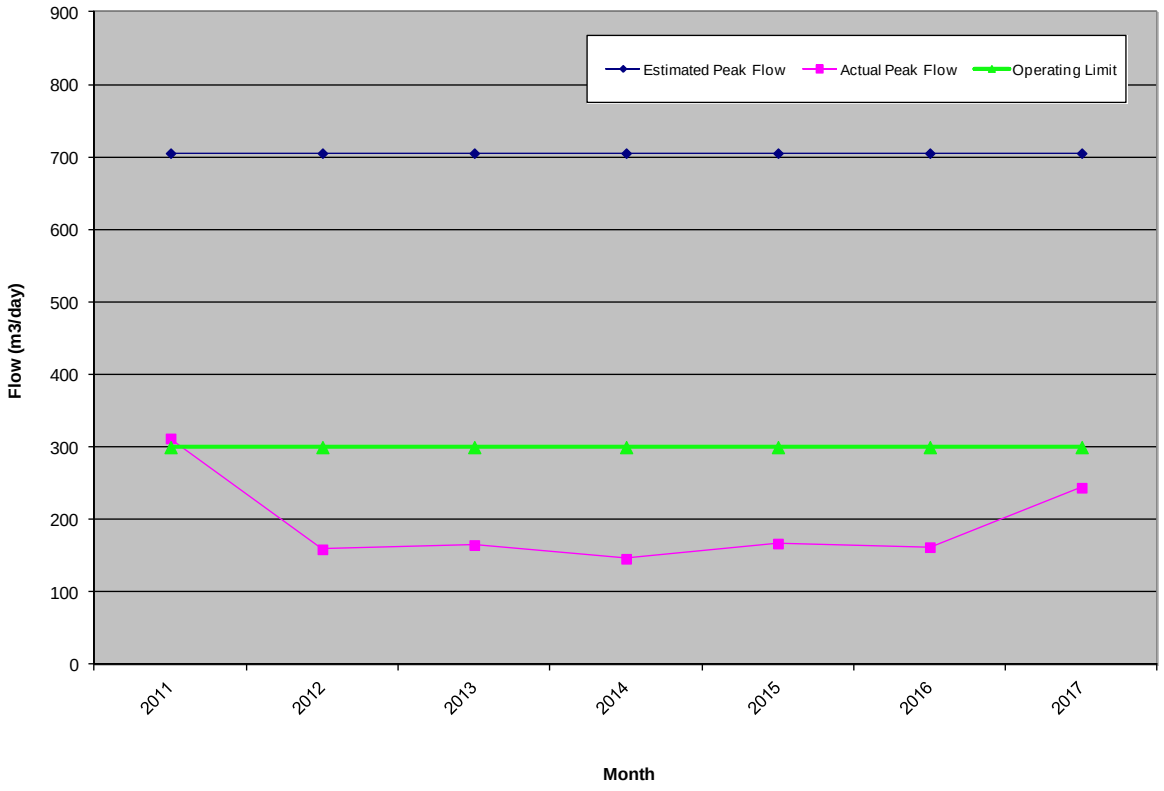
(a) actual peak flow
(b) corrected daily peak flows by the averaged correction faction for 2011, 2012, 2013, 2014, 2015, 2016 and 2017 correction factor:

2011	correction factor of	312*/705.5	= 0.44
2012	"	159/705.5	= 0.22
2013	"	165/705.5	= 0.23
2014	"	146/705.5	= 0.21
2015	"	167/705.5	= 0.24
2016	"	162/705.5	= 0.23
2017	"	244/705.5	= 0.34
	AVERAGE		**= 0.27**

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

Figure 6

Estimated vs Actual Peak Flows (Historical)



5.0 OVERVIEW OF COLUMBIA RIVER SAMPLE RESULTS

This section provides data and analysis for the Columbia River samples taken during 2017.

Table 5 provides a summary record of the Columbia River test results for the period April 10th, 2017 to October 18th, 2017.

Elevated fecal coliforms were observed in the upstream samples on April 18th. The results were low in the effluent, side stream and downstream samples on the same day. Elevated coliforms were found above the discharge limits in the effluent on January 31st and March 29th; however, River was not tested on those days. In general, the levels of coliforms in the upstream samples were higher than those found in the effluent, side stream or downstream samples.

Low levels of E.Coli were found throughout the season in the River samples and the effluent samples. There were no days where the effluent levels were above the discharge limits. In general, the levels of coliforms in the upstream samples were higher than those found in the effluent, side stream or downstream samples

Elevated Enterococci was found in the upstream samples on September 27th and October 10th. The levels were also high in the effluent (above discharge limits) on September 27th. The levels in the side stream and downstream were lower on the same day. All other levels in the upstream, downstream and side stream samples were generally low or below laboratory detection limits. In general, the levels of Enterococci in the upstream samples were higher than those found in the effluent, side stream or downstream samples.

Generally, the levels of TSS were low in the river and effluent except for upstream and side stream samples on September 27th. The levels were both at 123 mg/L. The levels of TSS in the effluent and the downstream samples on the same days were 10 mg/L and 81.3 mg/L respectively. The levels in the effluent were significantly lower than in the River samples.

Although several spikes were observed for several parameters, the averages this year are comparable to previous years. There does not seem to be any correlation with the spikes in the river samples with the levels found in the effluent on the same days.

Overall, the analyzed concentrations remain constant between the upstream (UP) sampling zone and the downstream (DN) sampling zone. The data indicates that the plant's effluent does not appear to have any adverse effect on background nutrient concentrations in the Columbia River.

Figure 7a & 7b

Fecal Coliform Levels in the Columbia River and the Effluent

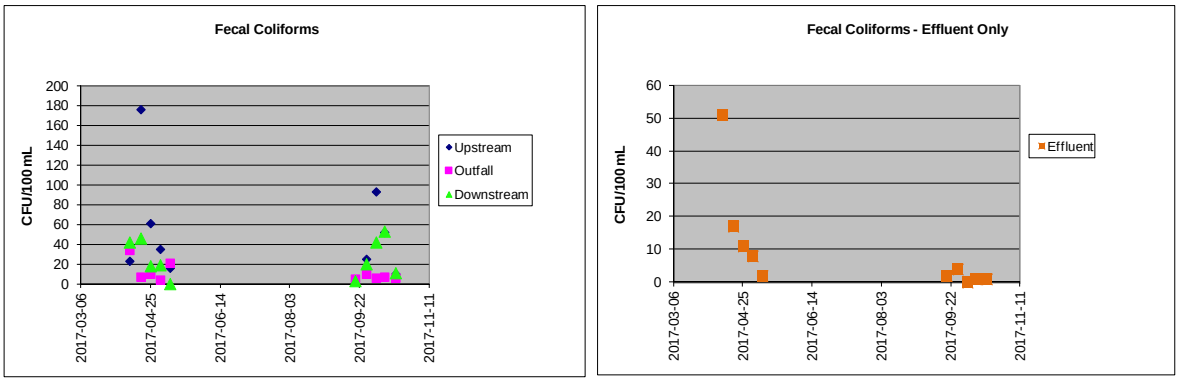


Figure 8a & 8b

E.Coli Levels in the Columbia River and the Effluent

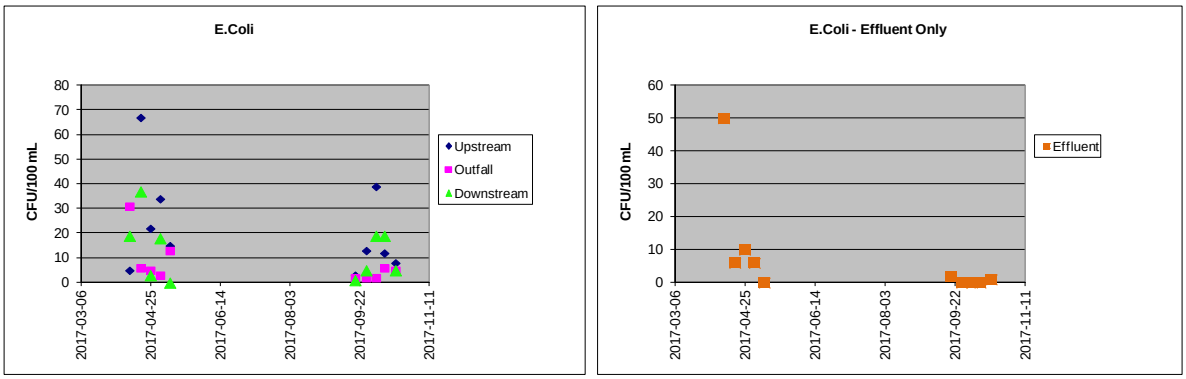


Figure 9a and 9b

Enterococci Levels in the Columbia River and the Effluent

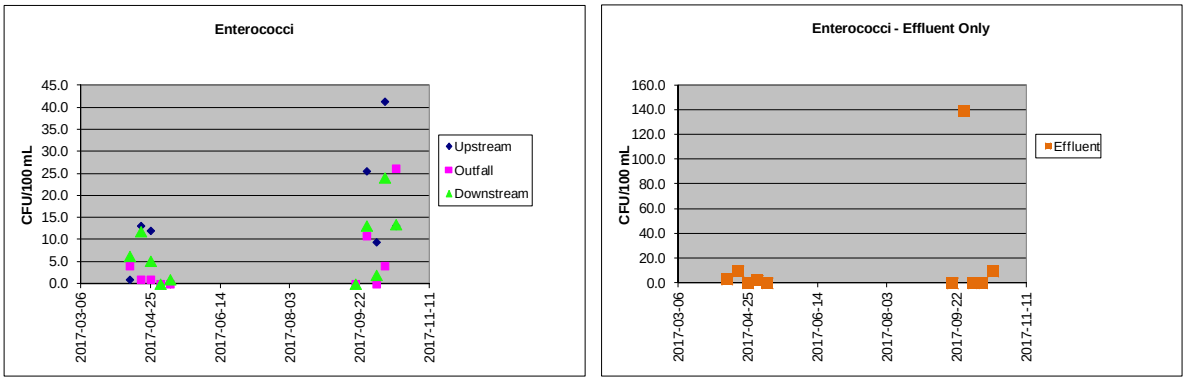


Table 5

2017 Columbia River Sample Results

Sample Date	NH_3			Ortho-P			Fecal Coliform			E.Coli			Total P mg/L		
yyyy/mm/dd	UP	SIDE	DN	UP	SIDE	DN	UP	SIDE	DN	UP	SIDE	DN	UP	SIDE	DN
2017-04-10	0.204	0.082	0.105	0.005	0.005	0.005	23	34	42	5	31	19	0.013	0.014	0.006
2017-04-18	0.065	0.089	0.050	0.005	0.005	0.005	176	7	46	67	6	37	0.029	0.011	0.014
2017-04-25	0.069	0.258	0.076	0.005	0.005	0.005	61	10	18	22	5	3	0.018	0.008	0.014
2017-05-02	0.050	0.050	0.050	0.005	0.005	0.005	35	4	19	34	3	18	0.009	0.017	0.008
2017-05-09	0.050	0.135	0.060	0.005	0.005	0.005	16	21	1	15	13	1	0.067	0.024	0.022
2017-09-19	0.050	0.050	0.050	0.005	0.005	0.005	3	5	3	3	2	1	0.030	0.027	0.035
2017-09-27	0.050	0.050	0.050	0.005	0.005	0.005	25	10	20	13	2	5	0.093	0.115	0.076
2017-10-04	0.050	0.050	0.050	0.005	0.005	0.005	93	6	42	39	2	19	0.015	0.016	0.014
2017-10-10	0.050	0.050	0.050	0.005	0.005	0.005	52	7	53	12	6	19	0.015	0.017	0.013
2017-10-18	0.050	0.050	0.050	0.005	0.005	0.005	10	6	11	8	5	5	0.020	0.020	0.027
# Samples	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Average	0.069	0.086	0.059	0.01	0.01	0.01	49	11	26	22	8	13	0.03	0.03	0.02
Maximum	0.204	0.258	0.105	0.01	0.01	0.01	176	34	53	67	31	37	0.09	0.12	0.08
Minimum	0.050	0.050	0.050	0.01	0.01	0.01	3.0	4.0	1.0	3.0	2.0	1.0	0.01	0.01	0.01

Sample Date	pH			TSS			$N\text{-}NO_3$			$N\text{-}NO_2$			Enterococci		
yyyy/mm/dd	UP	SIDE	DN	UP	SIDE	DN	UP	SIDE	DN	UP	SIDE	DN	UP	SIDE	DN
2017-04-10	7.8	7.8	7.8	10.0	10.0	10.0	0.13	0.10	0.14	0.010	0.010	0.010	1.0	4.1	6.3
2017-04-18	7.8	7.8	7.8	18.3	13.7	17.0	0.11	0.09	0.13	0.010	0.010	0.010	13.2	1.0	11.9
2017-04-25	7.8	7.8	7.8	26.7	16.0	36.0	0.12	0.09	0.14	0.010	0.010	0.010	12.1	1.0	5.2
2017-05-02	7.8	7.8	7.8	6.7	8.0	4.0	0.13	0.11	0.15	0.010	0.010	0.010	-	-	-
2017-05-09	7.7	7.6	8.0	56.7	25.3	21.3	0.29	0.30	0.25	0.010	0.010	0.010	1.0	1.0	1.0
2017-09-19	7.6	7.6	7.6	42.7	24.7	70.0	0.08	0.07	0.08	0.010	0.010	0.010	-	-	-
2017-09-27	7.6	7.2	7.6	123.0	123.0	81.3	0.08	0.09	0.07	0.010	0.010	0.010	25.6	10.9	13.2
2017-10-04	7.8	8.0	8.0	7.3	5.3	9.3	0.08	0.09	0.09	0.010	0.010	0.010	9.5	1.0	2.0
2017-10-10	7.8	7.8	7.8	7.7	4.3	4.3	0.08	0.18	0.09	0.010	0.010	0.010	41.4	4.1	24.1
2017-10-18	8.2	8.2	8.2	19	21	34	0.09	0.11	0.10	0.010	0.010	0.010	13.2	26.2	13.5
# Samples	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Average	7.8	7.8	7.8	31.8	25.1	28.8	0.12	0.12	0.12	0.01	0.01	0.01	15	6	10
Maximum	8.20	8.20	8.20	123.0	123.0	81.3	0.29	0.30	0.25	0.01	0.01	0.01	41	26	24
Minimum	7.60	7.20	7.60	6.7	4.3	4.0	0.08	0.07	0.07	0.01	0.01	0.01	1.0	1.0	1.0

Green shaded 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
SIDE – 1 km downstream of outfall from west shore (winter) and river side channel 350 m downstream of outfall (summer)
DN – Downstream

6.0 OVERVIEW OF EFFLUENT RESULTS

This section provides data and analysis for the effluent (treated) samples and plant flows for 2017.

A total of 18 effluent samples were collected and analyzed. Table 6 summarizes effluent test results for 2017.

Table 6

2017 Effluent Results

Date	2017 Effluent Results Summary												
	Flow	Temp	pH	NH_3-N	BOD	P-OP04	Coliforms	E.Coli	Total P	TSS	NO_3-N	NO_2-N	Enterococci
yyyy/mm/dd	m^3/d	C		mg/L	mg/L	mg/L	cfu/100ml	cfu/100ml	mg/L	mg/L	mg/L	mg/L	cfu/100ml
2017-01-04	133.68	-25.0	-	-	5.3	-	-	-	-	6.7	-	-	-
2017-01-31	108.03	-13.0	-	-	6.5	0.830	224	-	1.350	9.3	-	-	-
2017-02-27	94.71	-14.0	-	-	8.3	1.090	178	-	1.790	19.7	-	-	-
2017-03-29	120.21	0.0	-	-	11.6	1.120	600	-	1.620	12.3	-	-	-
2017-04-10	63.64	1.0	7.2	0.077	3.4	0.403	51	50	0.732	10	24.4	0.078	3.1
2017-04-18	74.01	3.0	-	0.091	4.8	0.418	17	6	0.701	8.3	23.6	0.081	9.7
2017-04-25	68.34	2.0	6.8	0.084	3.4	0.311	11	10	0.579	12.0	16.2	0.041	1.0
2017-05-02	51.47	10.0	6.6	0.080	2.5	0.791	8	6	1.060	4.7	14.5	0.043	2.0
2017-05-09	56.65	9.0	6.8	0.084	2.0	1.010	2	1	1.220	4.0	12.1	0.052	1.0
2017-06-28	61.70	10.0	-	-	2.0	1.070	-	-	1.110	3.7	-	-	-
2017-07-26	100.00	28.0	-	-	2.0	1.720	9	-	2.080	3.0	-	-	-
2017-08-29	100.00	8.0	-	-	2.0	-	1	-	-	3.0	-	-	-
2017-09-19	100.00	8.0	6.5	0.072	2.0	1.050	2	2	1.110	6.0	24.6	0.034	-
2017-09-27	73.00	1.0	6.8	0.074	2.0	1.570	4	1	1.820	10.0	23.7	0.028	139.1
2017-10-04	58.00	0	6.6	0.074	2.0	1.140	1	1	1.420	8.7	19.5	0.023	1.0
2017-10-10	74.00	6.0	6.8	0.066	2.6	0.818	1	1	1.100	4.3	23.7	0.041	1.0
2017-10-18	46.00	-2.0	6.8	0.114	2.0	0.742	1	1	0.972	24.3	19.0	0.035	9.5
2017-12-14	139.00	-9.0	-	-	2.0	0.474	36	-	0.588	3.7	-	-	-
# Samples	18	18	10	10	18	16	16	10	16	18	10	10	9
Average	85	0.0	0.00	0.082	3.7	0.91	72	8	1.20	8.5	20.1	0.05	19
High	139	28.0	6.80	0.114	11.6	1.72	600	50	2.08	24.3	24.6	0.08	139.1
Low	46	-9.0	6.50	0.066	2	0.311	1	1	0.58	3.0	12.1	0.02	1
Limit	300	N/A	N/A	N/A	45	0.5	200	77	1	45	N/A	N/A	20
# Over Limit	0	N/A	N/A	N/A	0	12	2	0	11	0	N/A	N/A	1

Notes: 1. Green shaded 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 to coliform results

6.1 RESULTS ANALYSIS

The average BOD in the effluent was 3.7 mg/L, which is higher when compared to 2016 and lower than in previous years. BOD was below the MSR limits for all the samples. TSS samples averaged 8.5 mg/L with a maximum concentration of 24.3 mg/L, both which were slightly higher than in 2016 but still significantly lower than the 2014. TSS was below the MSR limits for all the samples.

Low levels of bacteria were observed in the effluent this year with only two days (January 31st and March 29th) where high levels of fecal coliforms were observed. The levels on both days were above discharge limits. The results for Enterococci were above the discharge limits on September 27th. Low levels of bacteria were observed in the River on the same day. In general, the levels in the River were low and inconsistent with the levels in the effluent indicating there was no adverse impact to the River from the effluent.

Effluent ammonia concentrations were low throughout the year. The results for ammonia nitrogen were comparable to those in previous years.

The bioassay toxicity testing was completed this year. The results from 2017 showed that plant effluent was non-toxic. The results of the 2017 tests are shown below in Table 7.

Table 7

Toxicity Test Results

Sample Date	Result
2017-11-21	Pass

Twelve samples out of sixteen for ortho phosphorus and eleven out of sixteen for total phosphorus were above MSR discharge limits, which is higher from last year. The average for total phosphorus for 2017 was 1.20 mg/L compared to 1.07 mg/L in 2016, 2.77 mg/L in 2015, 2.43 mg/L in 2014, 1.65 mg/L in 2013 and 0.97 mg/L in 2012. The average for ortho phosphorus for 2017 was 0.91 mg/L compared to 0.88 mg/L in 2016, 2.37 mg/L in 2015, 2.18 mg/L in 2014, 1.26 mg/L in 2013 and 0.67 mg/L in 2012.

Ten samples out of fourteen for ortho phosphorus and six out of fourteen for total phosphorus were over the limits in 2016. Ten samples out of ten for ortho phosphorus and nine out of ten samples for total phosphorus were over the limits in 2015. Ten samples for ortho phosphorus and eight samples for total phosphours were over the limits in 2014. Nine samples for ortho phosphorus and seven samples for total phosphorus were over the limits in 2013 and five samples for total and ortho phosphorus were over the limits in 2012. Only one sample for total phosphorus was over the limit in 2011. In 2009 and 2010, there were no exceedances for total phosphorus or ortho phosphorus. Phosphorus is further discussed in Section 11. Phosphorus levels are under review and KHMUC will continue to modify and adjust dosing of ClearPac until all the test results show levels within the allowable limits.

Nitrate, nitrite, TSS and BOD results were slightly higher from last year; however still comparable to previous years.

Figure 10

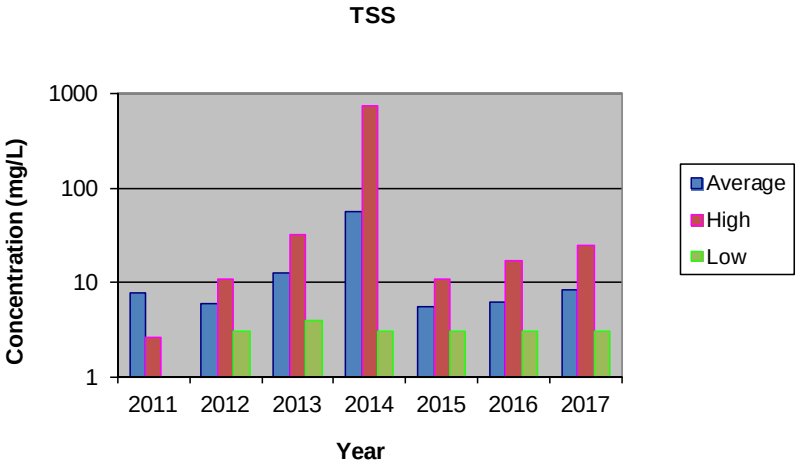


Figure 11

NO3-N

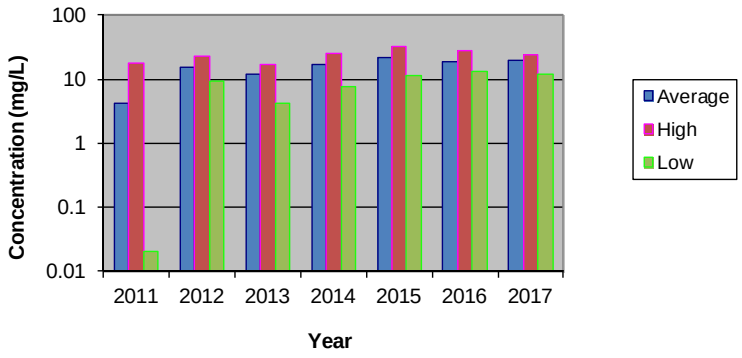
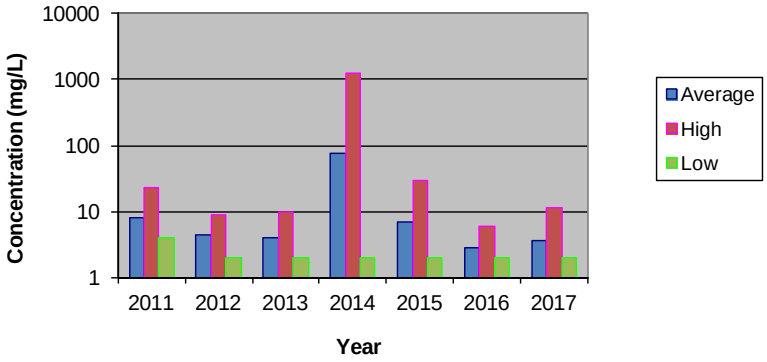


Figure 12

BOD



6.2 COMPLIANCE SUMMARY

Table 8 summarizes the number of days that samples exceeded MSR effluent requirements.

Table 8

2017 MSR Parameter Compliance

Parameter	Unit	MSR Limit	No. Of Samples	Average Value	Max. Value	Samples Over Limit
Flow	m^3/day	300	365	85.9	244	0
BOD_5	mg/l	45	18	3.7	11.6	0
TSS	mg/l	45	18	8.5	24.3	0
Total Phosphorus	mg/l	1	16	1.20	2.08	11
Ortho Phosphate	mg/l	0.5	16	0.91	1.72	12
Fecal Coliforms	cfu/100ml	200	16	72	600	2
Enterococci	cfu/100ml	20	9	19	139.1	1
E.Coli	cfu/100ml	77	10	8	50	0
96 hr LC_{50} Bioassay	/	Non-toxic	1	Pass	Pass	0

This year the test results indicated that out of the samples collected there were 11 exceedances for total phosphorus, 12 exceedances for ortho-phosphorus, 2 exceedance for fecal coliforms, and 1 exceedance for Enterococci.

7.0 SLUDGE PRODUCTION AND DISPOSAL

This section provides data regarding the disposal of bio-solids (sludge) from the treatment facility in 2017.

Waste activated sludge used to be stored in a thickener and removed by vacuum tanker. In the fall of 2014, a 12 unit Teknofanghi (Model Number 12BCAVPK) supplied by Drycake was installed and was commissioned in mid December. Historically, the sludge was bagged and disposed of at the CSRD Landfill located in Golden, BC; however, due to increased costs for dumping, the sludge from 2017 season is being stored on site until a new disposal location is determined.

Hauling data for pumped solids are in Table 9.

Table 9

2017 Pumped Solids Data

Month	Vol. Pumped (m^3)
January	298
February	250
March	345
April	117
May	36
June	72
July	173
August	298
September	149
October	48
November	36
December	132
Total	1954

Volumes of sludge are currently being estimated by counting the quantity of bags produced. Long range plans call for the installation of a flow meter to better measure the quantity of sludge bagged.

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

8.0 PLANT IMPROVEMENTS & BYPASS EVENTS

The resort is committed to improvements to the phosphorus monitoring program and to implement further monitoring and increase dosage of clearpac. The resort will continue to address the phosphorus concern and bring phosphorus levels down.

KHMUC will undertake an assessment in the next year to determine the plant's capacity to accommodate additional growth.

There were no bypass events for 2017.

9.0 PHOSPHORUS REMOVAL

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

As seen in the graphs below, the levels of phosphorus were increasing from 2011 until 2015 and there has been a slight decrease since 2015. The average total phosphorus in 2011 was 0.36 mg/L, 0.97 mg/L in 2012, 1.65 mg/L in 2013, 2.43 mg/L in 2014, 2.77 mg/Lin 2015, 1.07 mg/L in 2016 and higher in 2017 at 1.20 mg/L. The same trend was observed with ortho phosphorus. The average ortho phosphorus in 2011 was 0.07 mg/L, 0.67 mg/L in 2012, 1.26 mg/L in 2013, 2.18 mg/L in 2014, 2.37 in 2015 0.88 mg/L in 2016 and slightly higher in 2017 at 0.91 mg/L. The days over limit for othro phosphorus were increasing from 2011 to 2014 and then were fairly consistent for several years (10 days over limit for 2014, 2015 and 2016) and then increasing again in 2017 at 12 days over the limit. The days over limit for total phosphorus increased from 2011 until 2015, decreased in 2016 and then increased to 11 days over the limit in 2017.

In the fall of 2015 KHMUC began injecting alum into the effluent to reduce the phosphorus levels in the plant effluent. There was a noticeable drop in the levels in the final EMS test run in 2015. Beginning in December 2016, KHMUC switched to ClearPac addition in the winter months to control phosphorus. In 2018, ClearPac will be used year round. Phosphorus levels are under review and KHMUC will continue to modify and adjust dosing of ClearPac until all the test results show levels within the allowable limits.

Additionally, KHMUC will continue to test total phosphorus and ortho phosphorus with the monthly effluent sampling tested by ALS. This will help to monitor the levels on an ongoing basis and help to determine dosage levels.

Figure 13

Total Phosphorus Levels 2011-2017

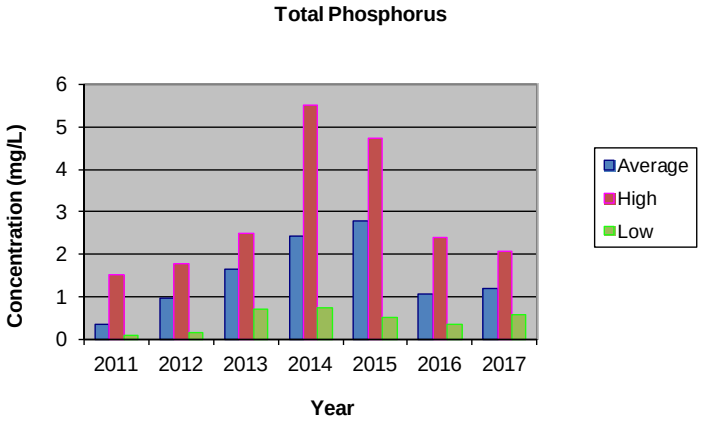


Figure 14

Ortho Phosphorus Levels 2011-2017

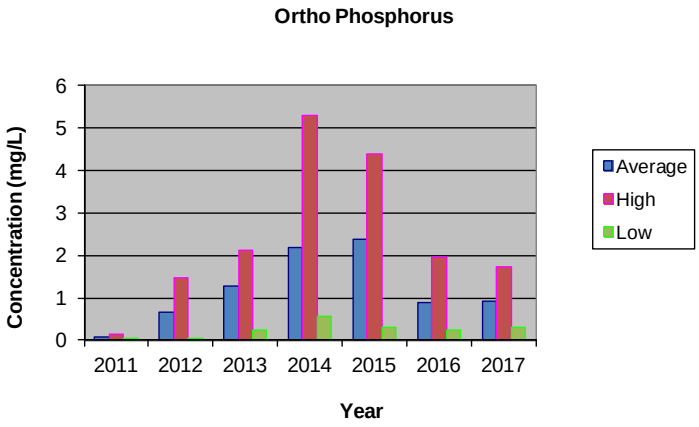
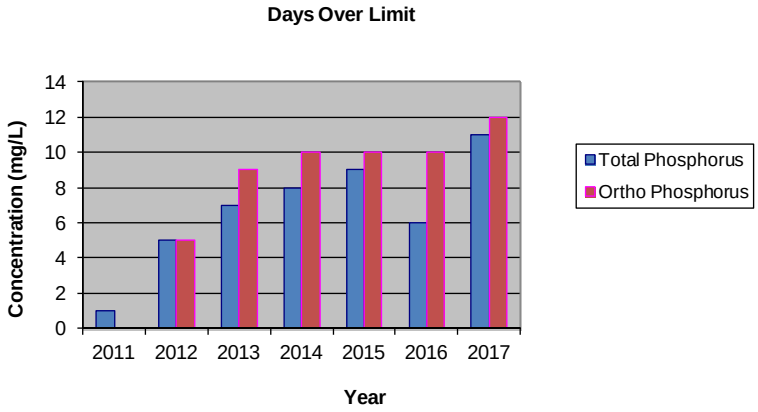


Figure 15

Days over Limit 2011-2017



10.0 ASSESSMENT SUMMARY

The total effluent flow recorded for 2017 was 31,431.05 m^3 with an average of 85.9 m^3/day. There were no days where the flow was over the allowable limit. Please note that the SCADA failed to record correct flow from July 24th until September 7th; therefore the flow was based on partial estimates.

The average BOD in the effluent was 3.7 mg/L, which is higher when compared to 2016 and lower than in previous years. BOD was below the MSR limits for all the samples. TSS samples averaged 8.5 mg/L with a maximum concentration of 24.3 mg/L, both which were slightly higher than in 2016 but still significantly lower than the 2014. TSS was below the MSR limits for all the samples.

Low levels of bacteria were observed in the effluent this year with only two days (January 31st and March 29th) where high levels of fecal coliforms were observed. The levels on both days were above discharge limits. The results for Enterococci were above the discharge limits on September 27th. Low levels of bacteria were observed in the River on the same day. In general, the levels in the River were low and inconsistent with the levels in the effluent indicating there was no adverse impact to the River from the effluent.

Effluent ammonia concentrations were low throughout the year. The results for ammonia nitrogen were comparable to those in previous years.

The bioassay toxicity testing was completed this year. The results from 2017 showed that plant effluent was non-toxic.

Twelve samples out of sixteen for ortho phosphorus and eleven out of sixteen for total phosphorus were above MSR discharge limits, which is higher from last year. Generally, the levels of total and ortho phosphorus are lower but the days over limit have increased. In 2018, ClearPac will be used year round. Phosphorus levels are under review and KHMUC will continue to modify and adjust dosing of ClearPac until all the test results show levels within the allowable limits.

Nitrate, nitrite, TSS and BOD results were slightly higher from last year; however still comparable to previous years.

A small 26 unit subdivision was proposed and construction started in 2014. Two duplex units were started and construction continued in 2015. Of the 26 approved units, Phase 1 (eight units) have been completed. Phase 2 (eight more units) have now been registered and is 50% sold out. Planning for Phase 3 is set to commence in the Summer of 2018. Currently, with measures implemented the plant runs at approximately 55% capacity. Flows should be monitored closely and additional improvements may be required as growth at the resort continues.

11.0 AUTHORITIZATION AND CLOSING

This report, titled *2017 Sewage Treatment Plant Annual Report,* was prepared for KHMUC 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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PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
J. ZVERINA
30366

J:comm/water/2018/W2012-003/Kicking Horse/2017 Sewage Treatment Report

Table 10 - Kicking Horse Resort Estimated Sewage Generation (m3/day)

Single Family Sub-Division	Flow* (l/unit/day)	Bed Units	Units	2011	2012	2013	2014	2015	2016	2017	2018
Purcell Woods	1363	174	29	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5
Cache Estates	1363	104	15	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4
Cache Residences	1363	184	19	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9
Dogtooth Properties	1363	150	16	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8
Cedar Creek Estates	1363	222	19	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9
	Subtotal	**834**	**98**	**133.6**	**133.6**	**133.6**	**133.6**	**133.6**	**133.6**	**133.6**	**133.6**

Multi-Family Units	Flow* (l/unit/day)	Bed Units	Units	2011	2012	2013	2014	2015	2016	2017	2018
Whispering Pines (2 & 3 Bedroom Townhouse)	1363	116	22	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Glacier Lodge (1,2,3 bedroom condo + Health Spa)**	1628	262	56	91.2	91.2	91.2	91.2	91.2	91.2	91.2	91.2
Selkirk resort Homes Ph1 (3+4 bedroom Townhouse)	1700	116	18	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6
Mountaineer Lodge (1,2,3 bedroom condo + Health Spa)**	1628	238	53	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3
Palliser Lodge (1,2,3 bedroom condo + Health Spa)**	1628	214	46	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9
Aspens (1,2 Bedroom Condo)	1136	216	60	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Selkirk Resort Homes Ph2 (3,4 Bedroom)	1700	62	10	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
The Cedars	1363	12	2	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
	Subtotal	**1236**	**267**	**400.8**	**400.8**	**400.8**	**400.8**	**400.8**	**400.8**	**400.8**	**400.8**

Day Users	Flow* (l/unit/day)	Population (each)	2011	2012	2013	2014	2015	2016	2017	2018
Skiers	36	1000	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
	Subtotal	**1000**	**36.0**	**36.0**	**36.0**	**36.0**	**36.0**	**36.0**	**36.0**	**36.0**

Commercial Lodges	Flow* (l/unit/day)	Bed Units	Units	2011	2012	2013	2014	2015	2016	2017	2018
Copperhorse Lodge (10 Bedroom B&B)	366	28	10	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Vagabond Lodge (10 Bedroom B&B)	366	28	10	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
The Winston Lodge (10 Bedroom B&B)	366	28	10	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
	Subtotal	**84**	**30**	**11.0**	**11.0**	**11.0**	**11.0**	**11.0**	**11.0**	**11.0**	**11.0**

Dining Facilites/Bars	Flow* (l/m^2/day)	Area (m2)	2011	2012	2013	2014	2015	2016	2017	2018
Peaks Bar & Grill	145	256	37.1	37.1	37.1	37.1	37.1	37.1	37.1	37.1
KHMR Day Lodge	97	300	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
Corks (Vagabond Lodge)	97	120	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6
Kicking Horse Saloon (The Winston lodge)	97	287	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8
Double Black Coffee shop	97	190	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4
	Subtotal	**1153**	**124.1**	**124.1**	**124.1**	**124.1**	**124.1**	**124.0**	**124.1**	**124.1**

Daily Wastewater Flow (m3/day)*	705.5	705.5	705.5	705.5	705.5	705.5	705.5	705.5
Corrected Daily Peak Flow Projections	312*** (actual)	159 (actual)	165 (actual)	146 (actual)	164 (actual)	162 (actual)	244 (actual)	190 (estimated)

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

** Number reflects hot tub

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

BRITISH COLUMBIA

2010 VANCOUVER

April 28, 2005

File: RE-15474

REGISTERED MAIL

Kicking Horse Mountain Sanitary Sewer Services Ltd.
2100- 1075 W. Georgia Street
Vancouver, BC V6E 3G2

Attn: Arijan van Vuure

Dear Mr. van Vuure:

Re: Letter of Transmittal for Registration under the *Municipal Sewage Regulation* of the discharge to Columbia River from the Kicking Horse Mountain Resort located at Unsurveyed Crown land in the vicinity of Section 9, together with those parts of the Northwest ¼ of Section 14 and 15, all of Township 27, R22 West of 5th Meridian, and Unsurveyed Crown Foreshore, being part of the Columbia River, Kootenay District

Enclosed herewith is a copy of the registration letter RE-15474 in the name of the Kicking Horse Mountain Sanitary Sewer Services Ltd. Your attention is respectfully directed to the conditions outlined in the registration letter.

In addition to the registration letter and the terms and conditions of the Environmental Impact Study, dated November 20, 2000, you are directed to comply with the following requirements:

A. Outfall

The outfall shall consist of a permanent outfall with diffusers.

The permittee shall have the outfall inspected once each five years by independent qualified personnel to ensure it is in good working condition. An inspection report shall be submitted to the Regional Manager, Environmental Protection within 30 days after the inspection date. The first report shall be submitted by January 2006.

. . . 2

Ministry of Water, Land and Air Protection
Environmental Protection
Kootenay Region
Mailing/Location Address:
205 Industrial Rd. G
Cranbrook, BC V1C 7G5
Telephone: (250) 489-8540
Facsimile: (250) 489-8506
http://www.gov.bc.ca/
http://www.gov.bc.ca/wlap/

B. Environmental Monitoring

In accordance with Part 7, Section 26 and 27 and applicable conditions of Schedule 6 of the *Regulation*, the discharger shall undertake the discharge and receiving environment monitoring programs established by Masse & Miller Consulting Ltd., in their letter dated February 17, 2005.

The person collecting samples shall be properly trained in sample collection and handling.

C. Reporting non-compliances

The discharger is required to report instances of non-compliance within 15 days of the date of discovery. The discharger is required to provide a report of actions taken to remediate non-compliance within 30 days from the start of non-compliance.

D. Financial Security requirements

The discharger is required to notify the Ministry and to set up either a capital replacement fund or financial security or assurance plan when the residential development content, as defined by the *regulation*, exceeds 10%.

The administration of this registration, including periodic inspections and audits shall be carried out by staff from our sub-regional office located at 205 Industrial Road G, Cranbrook, BC, V1C 7G5. Any required information may be submitted to the Regional Manager, Environmental Protection at this address in lieu of the Director.

Yours truly,

Kathy Eichenberger, P.Eng.
for Director, *Environmental Management Act*
Kootenay and Okanagan Regions

AMT/KE:lkm

cc: Environment Canada
Kicking Horse Mountain Sanitary Sewer Services Ltd., 1500 Kicking Horse Trail, PO Box 839, Golden, BC V0A 1H0, Attn: John Urie
Ecofluid, #101-334 E. Kent Ave. South, Vancouver, BC V5X 4N5 Attn: Rolf Loker, VP & Manager of Operations
Ana C. May Tsui, MWLAP-Environment Protection, Cranbrook

BRITISH COLUMBIA

April 28, 2005

File: RE-15474

REGISTERED MAIL

Kicking Horse Mountain Sanitary Sewer Services Ltd.
2100-1075 W. Georgia Street
Vancouver, BC V6E 3G2

Attn: Arijan van Vuure

Dear Mr. van Vuure:

Re: Registration under the Municipal Sewage Regulation of the discharge to Columbia River from the Kicking Horse Mountain Resort located at Unsurveyed Crown land in the vicinity of Section 9, together with those parts of the Northwest ¼ of Section 14 and 15, all of Township 27, R22 West of 5th Meridian, and Unsurveyed Crown Foreshore, being part of the Columbia River, Kootenay District

Receipt of the completed Municipal Sewage Regulation registration form for the subject discharge is acknowledged. Pursuant to Part 2, section 3 of the Municipal Sewage Regulation, the effective date of registration of this discharge is November 24, 2000. The ministry file number for this discharge is RE-15474. Please indicate this number on all future correspondence regarding this discharge.

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 Municipal Sewage Regulation. Fees will be calculated using a maximum daily effluent discharge of 300 m^3/day, a maximum BOD_5 of 45 mg/L and a maximum TSS of 45 mg/L.

Acceptance of this registration under the Regulation is based on the following documents:

1. Kicking Horse Mountain Resort Ltd. Partnership, Registration Form dated November 24, 2000 and submitted by McElhanney Consulting Services Ltd.
2. Environmental Impact Study entitled Kicking Horse Mountain Resort – Environmental Impact Study for Sewage Treatment and Disposal, dated November 20, 2000, prepared by Western BioResources Consulting Ltd. and signed by Christopher Bullock, P.Eng.

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Ministry of Water, Land and Air Protection
Environmental Protection
Kootenay and Okanagan Regions
Mailing/Location Address:
401 - 333 Victoria Street
Nelson BC V1L 4K3
Telephone: 250 354-6355
Facsimile: 250 354-6332

Pursuant to Part 2, Section 3 (2) (k) of the Municipal Sewage Regulation, more stringent standards or requirements may be specified by the Director. Accordingly, in addition to the terms and conditions of the regulation, for this discharge the following standards and requirements apply. The following information related to RE-15474 must be submitted within 30 days:

1. Tables that summarize the Discharge Monitoring Program and the Environment Monitoring Sampling Programs. Tables should indicate sampling sites/locations and short description of the locations, parameters, sampling frequency, reporting frequency and standards and criteria to be met.
2. GPS coordinates for all sampling sites. Specify in decimal degrees to 4 decimal places using NAD83 Datum.

The discharger shall **report monitoring data** in accordance with Part 7, Section 28 of the *Regulation* and in accordance with the following requirements. Monitoring data shall be submitted to the Ministry (EMS) database quarterly within 30 days of the end of each quarter. Instances of non-compliances are to be notified and reported to the Manager in writing, with an explanation and action taken to remediate non-compliance.

In accordance with Part 7, Section 28 (3) of the *Regulation*, the discharger shall submit an annual report and do so in accordance with the annual report requirements of Section 28 of the *Regulation*. The annual report shall be prepared by a suitably qualified professional and shall include the following:

- Tabulated results of the Effluent and Environmental Monitoring Data with standards and criteria
- Interpretation of the monitoring data
- The total volume discharged over the year
- Total sludge wasted over the year and its final destination
- The state of compliance of the treatment facility/process
- Indicate the percentage of residential development, as defined in the *Regulation*, that contributes to the effluent discharge
- Any additional relevant information the discharger wishes to provide

The annual report shall contain recommendations of a qualified professional regarding changes (additions, deletions, modifications) to the monitoring program. Electronic and hard copies of the annual report submission is due within 120 days of the end of each calendar year.

This decision to specify more stringent standards or requirements under the Municipal Sewage Regulation may be appealed to the Environmental Appeal Board in accordance with Part 8 of the *Environmental Management Act*. An appeal must be delivered within 30 days from the date that notice of this decision is given, in accordance with the practices, procedures and forms prescribed by regulation under the *Environment Management Act*. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

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The ministry uses a reference number to track monitoring data associated with discharges. 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*.

SAMPLING SITE/LOCATION	EMS NUMBER	DESCRIPTION
Columbia River UP IDZ	E256694	Upstream at the bridge
Columbia River 100m DN, main stem	E256695	~ 100 m downstream of outfall, at main stem from island
Columbia River 100m DN, side channel	E258897	~ 100 m downstream of outfall, at side channel
Columbia River 200m DN, east shore	E258898	~ 200 m downstream of outfall, from east shore
Columbia River 1km DN, west shore	E258899	~ 1 km downstream of outfall, downstream of island from west shore
Plant Effluent	E256696	Sample prior to the discharge outfall

For information on the use of EMS and the electronic data transfer utility, please refer to the following website: http://wlapwww.gov.bc.ca/epd/ems_edt.html

Your attention is respectfully directed to the terms and conditions outlined in the Municipal Sewage Regulation. Compliance with all the terms and conditions of the regulation is required. Contravention of any of the conditions of the regulation is a violation of the *Environmental Management Act* and may result in prosecution.

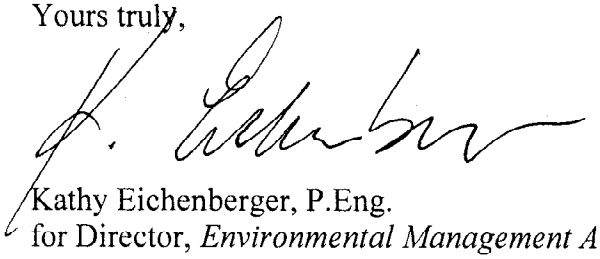
Registration under the Municipal Sewage Regulation should not be construed as a representation that the works are adequately designed or will satisfy all the requirements of the regulation. It is the responsibility of the discharger to ensure that the works are adequately designed, constructed and operated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

. . . 4

Registration under the Municipal Sewage 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 Municipal Sewage Regulation will be carried out by staff from our Sub-regional office located at 205 Industrial Road G, Cranbrook, British Columbia, V1C 7G5 (Telephone 250-489-8540). Plans, data and reports pertinent to the regulation are to be submitted to the Regional Manager, Environmental Protection, at this address. If you have any questions concerning this registration, please contact our Cranbrook Sub-Regional Office at 250-489-8540

Yours truly,



Kathy Eichenberger, P.Eng.
for Director, *Environmental Management Act*
Kootenay and Okanagan Regions

cc:	Environment Canada
	Kicking Horse Mountain Sanitary Sewer Services Ltd., 1500 Kicking Horse Trail, PO Box 839, Golden, BC V0A 1H0, Attn: John Urie
	Ecofluid, #101-334 E. Kent Ave. South, Vancouver, BC V5X 4N5 Attn: Rolf Loker, VP & Manager of Operations
	Ana C. May Tsui, MWLAP- Environmental Protection, Cranbrook

AMT/KE:lkm

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 05-JAN-17
Report Date: 11-JAN-17 11:54 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1876098

Project P.O. #: NOT SUBMITTED
Job Reference: RCR-KICKING HORSE MOUNTAIN RESORT
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1876098-1 UV TROUGH							
Sampled By: TJ on 04-JAN-17 @ 12:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	5.3		2.0	mg/L		05-JAN-17	R3630769
Total Suspended Solids	6.7		3.0	mg/L		06-JAN-17	R3629242

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

Reference Information

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.

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:

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.

Quality Control Report

Workorder: L1876098 Report Date: 11-JAN-17

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3630769								
WG2462283-2 LCS								
Biochemical Oxygen Demand			98.4		%		85-115	05-JAN-17
WG2462283-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	05-JAN-17
TSS-CL	**Water**							
Batch R3629242								
WG2461255-2 LCS								
Total Suspended Solids			90.7		%		85-115	06-JAN-17
WG2461255-1 MB								
Total Suspended Solids			<3.0		mg/L		3	06-JAN-17

Quality Control Report

Legend:

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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS Environmental

Chain of Custody / Analytical Reques
Canada Toll Free: 1 800 668 987
www.alsglobal.com

L1876098-COFC

Report To		Report Format / Distribution		Analysis Request
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-6003 Fax:	Email 3:	mskyring@kickinghorseresort.com	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	RCR - Kicking Horse Mountain Resort	
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:	Q33059	

Lab Work Order # (lab use only):

ALS Contact: LS Sampler: TJ

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	TSS	Fecal Coliform	Total Coliform	Number of Containers
	UV trough	JAN 4 17	12 PM	Water	X	X			2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			MM	5-Jan/16	11:10	2° °C				

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 01-FEB-17
Report Date: 07-FEB-17 16:24 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1885862

Project P.O. #: NOT SUBMITTED
Job Reference: RCR - KICKING HORSE MOUNTAIN RESORT
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1885862-1 UV TROUGH							
Sampled By: TJ on 31-JAN-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	6.5		2.0	mg/L		01-FEB-17	R3647465
Orthophosphate-Dissolved (as P)	0.830	DLA	0.050	mg/L		02-FEB-17	R3645779
Coliform Bacteria - Fecal	224	OCR	1	CFU/100mL		01-FEB-17	R3646043
Phosphorus (P)-Total	1.35	DLA	0.050	mg/L		07-FEB-17	R3647888
Total Suspended Solids	9.3		3.0	mg/L		05-FEB-17	R3647494

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

Reference Information

Qualifiers for Individual Samples Listed:

Sample Numbe	Client ID	Qualifier	Description
L1885862-1	UV TROUGH	SPL	TOTAL P - Sample was Preserved at the laboratory

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.

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.

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.

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:

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.

Quality Control Report

Workorder: L1885862 Report Date: 07-FEB-17

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3647465								
WG2475427-2 LCS								
Biochemical Oxygen Demand			98.0		%		85-115	01-FEB-17
WG2475427-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	01-FEB-17
FCC-MF-CL	**Water**							
Batch R3646043								
WG2474530-2 DUP		**L1885862-1**						
Coliform Bacteria - Fecal		224	208		CFU/100mL	7.4	65	01-FEB-17
WG2474530-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	01-FEB-17
P-T-COL-CL	**Water**							
Batch R3647888								
WG2475851-2 LCS								
Phosphorus (P)-Total			106		%			07-FEB-17
WG2475851-1 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	07-FEB-17
PO4-DO-COL-CL	**Water**							
Batch R3645779								
WG2473938-10 LCS								
Orthophosphate-Dissolved (as P)			106.8		%		80-120	02-FEB-17
WG2473938-9 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	02-FEB-17
TSS-CL	**Water**							
Batch R3647494								
WG2475555-5 LCS								
Total Suspended Solids			92.9		%		85-115	05-FEB-17
WG2475555-4 MB								
Total Suspended Solids			<3.0		mg/L		3	05-FEB-17

Quality Control Report

Legend:

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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS Environmental

L1885862-COFC

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Page 1 of 1

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-6003 Fax:	Email 3:	mskyring@kickinghorseresort.com	**Analysis Request**
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	RCR - Kicking Horse Mountain Resort	
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:	Q33059	
Lab Work Order # (lab use only)	L1885862	ALS Contact:	LS	Sampler: TJ

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	TSS	Fecal Coliform	[illegible]	TOTAL PHOSPHATE	ORTHO PHOSPHATE						Number of Containers
	UV trough	JAN 31, 14	2PM	Water	X	X	X		X	X						4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date: JAN 31/14	Time: 12:40	Temperature: 8 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 28-FEB-17
Report Date: 07-MAR-17 10:03 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1895421

Project P.O. #: NOT SUBMITTED
Job Reference: RCR - KICKING HORSE MOUNTAIN RESORT
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1895421-1 UV TROUGH							
Sampled By: TJ on 27-FEB-17 @ 09:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	8.3	DLHC	6.0	mg/L		28-FEB-17	R3668024
Orthophosphate-Dissolved (as P)	1.09	DLA	0.050	mg/L		28-FEB-17	R3664463
Coliform Bacteria - Fecal	178	DLM	2	CFU/100mL		28-FEB-17	R3664869
Phosphorus (P)-Total	1.79	DLA	0.010	mg/L		06-MAR-17	R3668806
Total Suspended Solids	19.7		3.0	mg/L		03-MAR-17	R3668287

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
SPL	PT - Sample was Preserved at the laboratory

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 (e.g. chemical interference, colour, turbidity).

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.

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.

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:

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.

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3668024								
WG2489166-2 LCS								
Biochemical Oxygen Demand			90.4		%		85-115	28-FEB-17
WG2489166-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	28-FEB-17
FCC-MF-CL	**Water**							
Batch R3664869								
WG2487147-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	28-FEB-17
P-T-COL-CL	**Water**							
Batch R3668806								
WG2489792-2 LCS								
Phosphorus (P)-Total			103.1		%		80-120	06-MAR-17
WG2489792-1 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	06-MAR-17
PO4-DO-COL-CL	**Water**							
Batch R3664463								
WG2486394-2 LCS								
Orthophosphate-Dissolved (as P)			95.8		%		80-120	28-FEB-17
WG2486394-1 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	28-FEB-17
TSS-CL	**Water**							
Batch R3668287								
WG2489376-2 LCS								
Total Suspended Solids			94.4		%		85-115	03-MAR-17
WG2489376-1 MB								
Total Suspended Solids			<3.0		mg/L		3	03-MAR-17

Quality Control Report

Legend:

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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS Environmental

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L1895421-COFC

COC # _____

Page 1 of 1

Report To		Report Fo		vice Requested (Rush for routine analysis subject to availability)
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	☑ Standard		○ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-6003 Fax:	Email 3:	mskyring@kickinghorseresort.com	Analysis Request
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	RCR - Kicking Horse Mountain Resort	
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:	Q33059	
Lab Work Order # (lab use only)		ALS Contact:	LS	Sampler: TJ

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	TSS	Fecal Coliform	[illegible]	ORT #0 PHOSPHATE	TOTAL PHOSPHATE						Number of Containers
	UV trough	FEB 27	9AM	Water	X	X	X		X	X						3

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
				2/28	11:48	2 °C				

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 30-MAR-17
Report Date: 06-APR-17 08:44 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1906927

Project P.O. #: NOT SUBMITTED
Job Reference: RCR - KICKING HORSE MOUNTAIN RESORT
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1906927-1 UV TROUGH							
Sampled By: CLIENT on 29-MAR-17 @ 13:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	11.6	BODQ	6.0	mg/L		30-MAR-17	R3692336
Orthophosphate-Dissolved (as P)	1.12	DLA	0.050	mg/L		30-MAR-17	R3687764
Coliform Bacteria - Fecal	600	DLA	100	CFU/100mL		30-MAR-17	R3689406
Phosphorus (P)-Total	1.62	DLA	0.10	mg/L		31-MAR-17	R3688844
Total Suspended Solids	12.3		3.0	mg/L		04-APR-17	R3693423

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

Reference Information

Qualifiers for Individual Samples Listed:

Sample Numbe	Client ID	Qualifier	Description
L1906927-1	UV TROUGH	SPL	TOTAL P - Sample was Preserved at the laboratory

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

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.

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.

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:

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.

Quality Control Report

Workorder: L1906927 Report Date: 06-APR-17

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3692336								
WG2505425-2 LCS								
Biochemical Oxygen Demand			82.9	LCS-ND	%		85-115	30-MAR-17
WG2505425-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	30-MAR-17
FCC-MF-CL	**Water**							
Batch R3689406								
WG2503741-2 DUP		**L1906927-1**						
Coliform Bacteria - Fecal		600	500		CFU/100mL	18	65	30-MAR-17
WG2503741-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	30-MAR-17
P-T-COL-CL	**Water**							
Batch R3688844								
WG2503553-2 LCS								
Phosphorus (P)-Total			87.9		%		80-120	31-MAR-17
WG2503553-1 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	31-MAR-17
PO4-DO-COL-CL	**Water**							
Batch R3687764								
WG2502957-4 DUP		**L1906927-1**						
Orthophosphate-Dissolved (as P)		1.12	1.11		mg/L	0.2	20	30-MAR-17
WG2502957-2 LCS								
Orthophosphate-Dissolved (as P)			101.0		%		80-120	30-MAR-17
WG2502957-1 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	30-MAR-17
TSS-CL	**Water**							
Batch R3693423								
WG2506309-2 LCS								
Total Suspended Solids			96.7		%		85-115	04-APR-17
WG2506309-1 MB								
Total Suspended Solids			<3.0		mg/L		3	04-APR-17

Quality Control Report

Legend:

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

Sample Parameter Qualifier Definitions:

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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS Environmental

Chain of Custody / Ana
Canada Toll Free:
www.alsglc

L1906927-COFC

COC # _____

Page 1 of 1

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-6003 Fax:	Email 3:	mskyring@kickinghorseresort.com	Analysis Request
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	RCR - Kicking Horse Mountain Resort	
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:	Q33059	
Lab Work Order # (lab use only)	L1906297	ALS Contact:	LS	Sampler: TJ

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	TSS	Fecal Coliform	[redacted]	ORTHO PHOSPHATE	TOTAL P						Number of Containers
	UV trough	MAR 29	1PM	Water	X	X	X		X	X						4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
				3/30	9:27	8 °C				

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 11-APR-17
Report Date: 20-APR-17 15:07 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1911339

Project P.O. #: NOT SUBMITTED
Job Reference: WEEK 1 - 2017 SPRING EMS PROGRAM - WW
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1911339-1 WWTP EFFLUENT - UV TROUGH TEMP: 10C PH: 7.2							
Sampled By: TJ/MS on 10-APR-17 @ 13:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.077		0.050	mg/L		12-APR-17	R3698941
Biochemical Oxygen Demand	3.4		2.0	mg/L		11-APR-17	R3700273
Orthophosphate-Dissolved (as P)	0.403	DLA	0.025	mg/L		11-APR-17	R3696962
Enterococcus	See Attached					11-APR-17	R3703580
Coliform Bacteria - Fecal	51	OCR	1	CFU/100mL		11-APR-17	R3701166
MPN - E. coli	50	OCR	1	MPN/100mL		11-APR-17	R3700903
Phosphorus (P)-Total	0.732	DLA	0.050	mg/L		15-APR-17	R3701492
Total Suspended Solids	<10		10	mg/L		15-APR-17	R3701592
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	24.4		0.020	mg/L		11-APR-17	R3698416
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	24.5		0.050	mg/L		12-APR-17	
Nitrite in Water by IC							
Nitrite (as N)	0.078		0.010	mg/L		11-APR-17	R3698416
L1911339-2 COLUMBIA RIVER UPSTREAM TEMP: 6.6C PH: 7.8							
Sampled By: TJ/MS on 10-APR-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.204		0.050	mg/L		12-APR-17	R3698941
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		11-APR-17	R3696962
Enterococcus	See Attached					11-APR-17	R3703580
Coliform Bacteria - Fecal	23	OCR	1	CFU/100mL		11-APR-17	R3701166
MPN - E. coli	5	OCR	1	MPN/100mL		11-APR-17	R3700903
Phosphorus (P)-Total	0.0133		0.0050	mg/L		15-APR-17	R3701492
Total Suspended Solids	<10		10	mg/L		15-APR-17	R3701592
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.132		0.020	mg/L		11-APR-17	R3698416
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.132		0.050	mg/L		12-APR-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-APR-17	R3698416
L1911339-3 COLUMBIA RIVER DOWN STREAM TEMP: 7.0C PH: 7.8							
Sampled By: TJ/MS on 10-APR-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.105		0.050	mg/L		12-APR-17	R3698941
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		11-APR-17	R3696962
Enterococcus	See Attached					11-APR-17	R3703580
Coliform Bacteria - Fecal	42	OCR	1	CFU/100mL		11-APR-17	R3701166
MPN - E. coli	19	OCR	1	MPN/100mL		11-APR-17	R3700903
Phosphorus (P)-Total	0.0064		0.0050	mg/L		15-APR-17	R3701492
Total Suspended Solids	<10		10	mg/L		15-APR-17	R3701592
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.143		0.020	mg/L		11-APR-17	R3698416
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.143		0.050	mg/L		12-APR-17	

* 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
L1911339-3 COLUMBIA RIVER DOWN STREAM TEMP: 7.0C PH: 7.8							
Sampled By: TJ/MS on 10-APR-17 @ 14:00							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-APR-17	R3698416
L1911339-4 COLUMBIA RIVER SIDE CHANNEL TEMP: 7.7C PH: 7.8							
Sampled By: TJ/MS on 10-APR-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.082		0.050	mg/L		12-APR-17	R3698941
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		11-APR-17	R3696962
Enterococcus	See Attached					11-APR-17	R3703580
Coliform Bacteria - Fecal	35	OCR	1	CFU/100mL		11-APR-17	R3701166
MPN - E. coli	31	OCR	1	MPN/100mL		11-APR-17	R3700903
Phosphorus (P)-Total	0.0138		0.0050	mg/L		15-APR-17	R3701492
Total Suspended Solids	<10		10	mg/L		15-APR-17	R3701592
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.100		0.020	mg/L		11-APR-17	R3698416
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.100		0.050	mg/L		12-APR-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-APR-17	R3698416

* 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.

EC-MPN-CL	Water	MPN - E. coli	APHA 9223B

This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.
Recommended Holding Time:
Sample: 1 day
Reference: APHA

FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D

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

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-COL-CL	Water	Ammonia, Total (as N)	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the phenate colourimetric method.

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.

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**

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.

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3700273								
WG2511634-2 LCS								
Biochemical Oxygen Demand			90.6		%		85-115	11-APR-17
WG2511634-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	11-APR-17
EC-MPN-CL	**Water**							
Batch R3700903								
WG2511839-1 MB								
MPN - E. coli			<1		MPN/100mL		1	11-APR-17
FCC-MF-CL	**Water**							
Batch R3701166								
WG2511898-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	11-APR-17
NH3-COL-CL	**Water**							
Batch R3698941								
WG2510183-2 LCS								
Ammonia, Total (as N)			100.4		%		85-115	12-APR-17
WG2510183-1 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	12-APR-17
NO2-IC-N-CL	**Water**							
Batch R3698416								
WG2510141-14 LCS								
Nitrite (as N)			102.7		%		90-110	11-APR-17
WG2510141-13 MB								
Nitrite (as N)			<0.010		mg/L		0.01	11-APR-17
NO3-IC-N-CL	**Water**							
Batch R3698416								
WG2510141-14 LCS								
Nitrate (as N)			106.0		%		90-110	11-APR-17
WG2510141-13 MB								
Nitrate (as N)			<0.020		mg/L		0.02	11-APR-17
P-T-COL-CL	**Water**							
Batch R3701492								
WG2511538-2 LCS								
Phosphorus (P)-Total			85.5		%		80-120	15-APR-17
WG2511538-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-CL	**Water**							
Batch R3701492								
WG2511538-1 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	15-APR-17
PO4-DO-COL-CL	**Water**							
Batch R3696962								
WG2509566-3 DUP		**L1911339-1**						
Orthophosphate-Dissolved (as P)		0.403	0.412		mg/L	2.4	20	11-APR-17
WG2509566-2 LCS								
Orthophosphate-Dissolved (as P)			101.0		%		80-120	11-APR-17
WG2509566-1 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	11-APR-17
WG2509566-4 MS		**L1911339-1**						
Orthophosphate-Dissolved (as P)			N/A	MS-B	%		-	11-APR-17
TSS-CL	**Water**							
Batch R3701592								
WG2511447-5 LCS								
Total Suspended Solids			91.1		%		85-115	15-APR-17
WG2511447-4 MB								
Total Suspended Solids			<3.0		mg/L		3	15-APR-17

Quality Control Report

Legend:

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

Sample Parameter Qualifier Definitions:

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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

NAUTILUS ENVIRONMENTAL

ATTN: Lyudmyla Shvets
ALS Laboratory Group
2559 29th St. N.E.
Calgary, Alberta
Canada T1Y 7B5

Received: 2017/04/11, 1055
Report Date: 2017/04/20
Version: FINAL

Test Report

Client: ALS106
Reference: 1617-0847
Billing: L1911339

Senior Verifier

NAUTILUS ENVIRONMENTAL

Enterococcus Test Report

Result Summary

Client: ALS106
Reference: 1617-0847

Client: ALS Laboratory Group; operation Calgary

Samples: L1911339-1 WWTP EFFLUENT - UV TROUGH TEMP: 10C PH: 7.2
L1911339-2 COLUMBIA RIVER UPSTREAM TEMP: 6.6C PH: 7.8
L1911339-3 COLUMBIA RIVER DOWN STREAM TEMP: 7.0C PH: 7.8
L1911339-4 COLUMBIA RIVER SIDE CHANNEL TEMP: 7.7C PH: 7.8
Collection: collected on 2017/04/10 at 1330
Receipt: received on 2017/04/11 at 1055 by CQ/EJ
Containers: received 4 x 250 mL bottles at 9 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

Analysis: started on 2017/04/11 by JN; ended on 2017/04/12 by JN

Result:

Sample	Client Code	*Enterococcus* (MPN/100mL)
01	L1911339-1 WWTP EFFLUENT - UV TROUGH TEMP: 10C PH: 7.2	3.1
02	L1911339-2 COLUMBIA RIVER UPSTREAM TEMP: 6.6C PH: 7.8	1.0
03	L1911339-3 COLUMBIA RIVER DOWN STREAM TEMP: 7.0C PH: 7.8	6.3
04	L1911339-4 COLUMBIA RIVER SIDE CHANNEL TEMP: 7.7C PH: 7.8	4.1

Notes: MPN, most probable number

Comments: Test incubation was 24 hours at 41 ± 1°C
Reagents performed as expected

Method: *Enterococcus* by Most Probable Number method (WTRQ-ME-009)
Reference: Multiple-tube Technique, variation of 9230 B. (IDEXX Enterolert media)
Standard Methods for Examination of Water and Wastewater, 22nd ed. 2012. Edited by: E.W. Rice, L.S. Clesceri, A.E. Greenberg, and A.D. Eaton. APHA, AWWA, WEF, Washington. (ISBN 978-087553-013-0).

The test data and results are authorized and verified correct.

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 300 668 9878

www.alsglobal.com

L1911339-COFC

Page 1

Report To		Report Format / Distribution		Service (ity)
Company:	Kicking Horse Mountain Resort Utility Corporation	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Time - business days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-8442 Fax:	Email 3:	mskyring@kickinghorseresort.com	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	Week 1- 2017 Spring EMS program - WW	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact:	LS	Sampler: TJ/MS

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NOx	N-NO2	Total P	Ortho P	Fecal Coliform	Enterococci	E. Coli			Number of Containers
	WWTP Effluent - UV trough Temp: 10°c pH: 7.2	10-Apr-17	1330	Water	X	X	X	X	X	X	X	X	X	X			6
	Columbia River Upstream Temp: 6.6 pH: 7.8	10-Apr-17	2PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Down stream Temp: 7.0 pH: 7.8	10-Apr-17	2 PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Side Channel Temp: 7.7 pH: 7.8	10-Apr-17	2 PM	Water		X	X	X	X	X	X	X	X	X			4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh:mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
				4/11	9:22	9 °C				

CENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 19-APR-17
Report Date: 01-MAY-17 08:52 (MT)
Version: FINAL REV. 2

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1914350

Project P.O. #: NOT SUBMITTED
Job Reference: WEEK 2 - 2017 SPRING EMS PROGRAM
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1914350-1 WWTP EFFLUENT - UV THROUGH							
Sampled By: TJ/PAG on 18-APR-17 @ 13:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.091		0.050	mg/L		20-APR-17	R3703697
Biochemical Oxygen Demand	4.8		2.0	mg/L		19-APR-17	R3706404
Orthophosphate-Dissolved (as P)	0.418	DLA	0.025	mg/L		19-APR-17	R3703561
Enterococcus	See Attached					19-APR-17	R3710104
Coliform Bacteria - Fecal	17	OCR	1	CFU/100mL		19-APR-17	R3703572
MPN - E. coli	6	OCR	1	MPN/100mL		19-APR-17	R3703569
Phosphorus (P)-Total	0.701	DLA	0.050	mg/L		24-APR-17	R3707926
Total Suspended Solids	8.3		3.0	mg/L		19-APR-17	R3703375
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	23.6		0.020	mg/L		19-APR-17	R3703459
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	23.7		0.050	mg/L		20-APR-17	
Nitrite in Water by IC							
Nitrite (as N)	0.081		0.010	mg/L		19-APR-17	R3703459
L1914350-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/PAG on 18-APR-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.065		0.050	mg/L		20-APR-17	R3703697
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		19-APR-17	R3703561
Enterococcus	See Attached					19-APR-17	R3710104
Coliform Bacteria - Fecal	176	OCR	1	CFU/100mL		19-APR-17	R3703572
MPN - E. coli	67	OCR	1	MPN/100mL		19-APR-17	R3703569
Phosphorus (P)-Total	0.0289		0.0050	mg/L		24-APR-17	R3707926
Total Suspended Solids	18.3		3.0	mg/L		19-APR-17	R3703375
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.109		0.020	mg/L		19-APR-17	R3703459
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.109		0.050	mg/L		20-APR-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		19-APR-17	R3703459
L1914350-3 COLUMBIA RIVER DOWNSTREAM							
Sampled By: TJ/PAG on 18-APR-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		20-APR-17	R3703697
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		19-APR-17	R3703561
Enterococcus	See Attached					19-APR-17	R3710104
Coliform Bacteria - Fecal	46	OCR	1	CFU/100mL		19-APR-17	R3703572
MPN - E. coli	37	OCR	1	MPN/100mL		19-APR-17	R3703569
Phosphorus (P)-Total	0.0137		0.0050	mg/L		24-APR-17	R3707926
Total Suspended Solids	17.0		3.0	mg/L		19-APR-17	R3703375
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.128		0.020	mg/L		19-APR-17	R3703459
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.128		0.050	mg/L		20-APR-17	

* 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
L1914350-3 COLUMBIA RIVER DOWNSTREAM							
Sampled By: TJ/PAG on 18-APR-17 @ 14:00							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		19-APR-17	R3703459
L1914350-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ/PAG on 18-APR-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.089		0.050	mg/L		20-APR-17	R3703697
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		19-APR-17	R3703561
Enterococcus	See Attached					19-APR-17	R3710104
Coliform Bacteria - Fecal	7	OCR	1	CFU/100mL		19-APR-17	R3703572
MPN - E. coli	6	OCR	1	MPN/100mL		19-APR-17	R3703569
Phosphorus (P)-Total	0.0114		0.0050	mg/L		24-APR-17	R3707926
Total Suspended Solids	13.7		3.0	mg/L		19-APR-17	R3703375
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.091		0.020	mg/L		19-APR-17	R3703459
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.091		0.050	mg/L		20-APR-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		19-APR-17	R3703459

* 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.

EC-MPN-CL	Water	MPN - E. coli	APHA 9223B

This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.
Recommended Holding Time:
Sample: 1 day
Reference: APHA

FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D

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

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-COL-CL	Water	Ammonia, Total (as N)	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the phenate colourimetric method.

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.

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**

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.

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3706404								
WG2516108-4 DUP		**L1914350-1**						
Biochemical Oxygen Demand		4.8	4.1		mg/L	17	20	19-APR-17
WG2516108-2 LCS								
Biochemical Oxygen Demand			86.4		%		85-115	19-APR-17
WG2516108-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	19-APR-17
EC-MPN-CL	**Water**							
Batch R3703569								
WG2514316-1 MB								
MPN - E. coli			<1		MPN/100mL		1	19-APR-17
FCC-MF-CL	**Water**							
Batch R3703572								
WG2514326-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	19-APR-17
NH3-COL-CL	**Water**							
Batch R3703697								
WG2514429-3 DUP		**L1914350-2**						
Ammonia, Total (as N)		0.065	0.064		mg/L	1.2	20	20-APR-17
WG2514429-2 LCS								
Ammonia, Total (as N)			108.3		%		85-115	20-APR-17
WG2514429-1 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	20-APR-17
NO2-IC-N-CL	**Water**							
Batch R3703459								
WG2514225-2 LCS								
Nitrite (as N)			104.3		%		90-110	19-APR-17
WG2514225-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	19-APR-17
NO3-IC-N-CL	**Water**							
Batch R3703459								
WG2514225-2 LCS								
Nitrate (as N)			107.2		%		90-110	19-APR-17
WG2514225-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	19-APR-17
P-T-COL-CL	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-CL	**Water**							
Batch R3707926								
WG2516169-2 LCS								
Phosphorus (P)-Total			84.1		%		80-120	24-APR-17
WG2516169-1 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	24-APR-17
PO4-DO-COL-CL	**Water**							
Batch R3703561								
WG2513724-2 LCS								
Orthophosphate-Dissolved (as P)			99.7		%		80-120	19-APR-17
WG2513724-1 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	19-APR-17
TSS-CL	**Water**							
Batch R3703375								
WG2514112-2 LCS								
Total Suspended Solids			108.3		%		85-115	19-APR-17
WG2514112-1 MB								
Total Suspended Solids			<3.0		mg/L		3	19-APR-17

Quality Control Report

Legend:

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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

NAUTILUS ENVIRONMENTAL

ATTN: Lyudmyla Shvets
ALS Laboratory Group
2559 29th St. N.E.
Calgary, Alberta
Canada T1Y 7B5

Received: 2017/04/19, 1340
Report Date: 2017/04/26
Version: FINAL

Test Report

Client: ALS106
Reference: 1617-0882
Billing: L1914350

Senior Verifier

NAUTILUS ENVIRONMENTAL

Enterococcus Test Report

Result Summary

Client: ALS106
Reference: 1617-0882

Client: ALS Laboratory Group; operation Calgary

Sample: L1914350-1 WWTP EFFLUENT - UV THROUGH, L1914350-2 COLUMBIA RIVER UPSTREAM, L1914350-3 COLUMBIA RIVER DOWNSTREAM, L1914350-4 COLUMBIA RIVER SIDE CHANNEL
Collection: collected on 2017/04/18 at 1400
Receipt: received on 2017/04/19 at 1340 by EJ
Containers: received 4 x 250 mL bottles at 7 °C, in good condition with no seals and no initials
Description: type: water , collection method: not given

Analysis: started on 2017/04/19 by HS; ended on 2017/04/20 by HS

Result:

Sample	Client Code	*Enterococcus* (MPN/100mL)
01	L1914350-1 WWTP EFFLUENT - UV THROUGH	9.7
02	L1914350-2 COLUMBIA RIVER UPSTREAM	13.2
03	L1914350-3 COLUMBIA RIVER DOWNSTREAM	11.9
04	L1914350-4 COLUMBIA RIVER SIDE CHANNEL	1.0

Notes: MPN, most probable number

Comments: Test incubation was 24 hours at 41 ± 1°C
Reagents performed as expected
The samples were set outside of the 24 hour hold time as per the client's request.

Method: *Enterococcus* by Most Probable Number method (WTRQ-ME-009)
Reference: Multiple-tube Technique, variation of 9230 B. (IDEXX Enterolert media)
Standard Methods for Examination of Water and Wastewater, 22nd ed. 2012. Edited by: E.W. Rice, L.S. Clesceri, A.E. Greenberg, and A.D. Eaton. APHA, AWWA, WEF, Washington. (ISBN 978-087553-013-0).

The test data and results are authorized and verified correct.

ALS Environmental

Chain of Custody / Analytical R
Canada Toll Free: 1 800 S
www.alsglobal.com

L1914350-COFC

COC #

Page 1 of 1

Report To		Report Format / Distribution		ne analysis subject to availability)
Company:	Kicking Horse Mountain Resort Utilit / Corporation	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1	tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-8412 Fax:	Email 3:	pallardgaudreau@kickinghorseresort.com	**Analysis Request**
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	WEEK 2 - 2017 Spring EMS program	
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:	WW - Q33059	
Lab Work Order # (lab use only)		ALS Contact:	LS	Sampler: TJ/PAG

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-NO2	Total P	Ortho P	Fecal Coliform	Enterococci	E. Coli			Number of Containers
	WWTP Effluent - UV trough Temp: pH:	18-Apr-17	1pm	Water	X	X	X	X	X	X	X	X	X	X			5
	Columbia River Upstream Temp 10.7 pH: 7.8	18-Apr-17	2pm	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Down stream Temp: 11.6 pH: 7.8	18-Apr-17	2pm	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Side Channel Temp 11.8 pH: 7.8	18-Apr-17	2pm	Water		X	X	X	X	X	X	X	X	X			4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Please return fresh bottles for next weeks sampling- Thanks

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh:mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No? If Yes add SIF
PAG	22-Oct-13	16:45:00 PM		4/19	9:09	8 °C				

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 26-APR-17
Report Date: 04-MAY-17 10:34 (MT)
Version: FINAL REV. 2

Client Phone: 250-344-8442

Certificate of Analysis

Lab Work Order #: L1917509

Project P.O. #: NOT SUBMITTED
Job Reference: WEEK -2017 SPRING EMS PROGRAM - WW
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1917509-1 WWTP EFFLUENT -UV TROUGH							
Sampled By: TJ/CV on 25-APR-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.084		0.050	mg/L		01-MAY-17	R3712669
Biochemical Oxygen Demand	3.4		2.0	mg/L		27-APR-17	R3713386
Orthophosphate-Dissolved (as P)	0.311	DLA	0.025	mg/L		26-APR-17	R3709358
Enterococcus	See Attached					26-APR-17	R3714485
Coliform Bacteria - Fecal	11	OCR	1	CFU/100mL		26-APR-17	R3709336
MPN - E. coli	10	OCR	1	MPN/100mL		26-APR-17	R3709314
Phosphorus (P)-Total	0.579	DLA	0.050	mg/L		01-MAY-17	R3711142
Total Suspended Solids	12.0		3.0	mg/L		02-MAY-17	R3712524
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	16.2		0.020	mg/L		26-APR-17	R3709205
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	16.3		0.050	mg/L		27-APR-17	
Nitrite in Water by IC							
Nitrite (as N)	0.041		0.010	mg/L		26-APR-17	R3709205
L1917509-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/CV on 25-APR-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.069		0.050	mg/L		01-MAY-17	R3712669
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		26-APR-17	R3709358
Enterococcus	See Attached					26-APR-17	R3714485
Coliform Bacteria - Fecal	61	OCR	1	CFU/100mL		26-APR-17	R3709336
MPN - E. coli	22	OCR	1	MPN/100mL		26-APR-17	R3709314
Phosphorus (P)-Total	0.0182		0.0050	mg/L		01-MAY-17	R3711142
Total Suspended Solids	26.7		3.0	mg/L		02-MAY-17	R3712524
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.115		0.020	mg/L		26-APR-17	R3709205
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.115		0.050	mg/L		27-APR-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		26-APR-17	R3709205
L1917509-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/CV on 25-APR-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.076		0.050	mg/L		01-MAY-17	R3712669
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		26-APR-17	R3709358
Enterococcus	See Attached					26-APR-17	R3714485
Coliform Bacteria - Fecal	18	OCR	1	CFU/100mL		26-APR-17	R3709336
MPN - E. coli	3	OCR	1	MPN/100mL		26-APR-17	R3709314
Phosphorus (P)-Total	0.0143		0.0050	mg/L		01-MAY-17	R3711142
Total Suspended Solids	36.0		3.0	mg/L		02-MAY-17	R3712524
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.141		0.020	mg/L		26-APR-17	R3709205
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.141		0.050	mg/L		27-APR-17	

* 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
L1917509-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/CV on 25-APR-17 @ 15:00							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		26-APR-17	R3709205
L1917509-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ/CV on 25-APR-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.258		0.050	mg/L		01-MAY-17	R3712669
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		26-APR-17	R3709358
Enterococcus	See Attached					26-APR-17	R3714485
Coliform Bacteria - Fecal	10	OCR	1	CFU/100mL		26-APR-17	R3709336
MPN - E. coli	5	OCR	1	MPN/100mL		26-APR-17	R3709314
Phosphorus (P)-Total	0.0077		0.0050	mg/L		01-MAY-17	R3711142
Total Suspended Solids	16.0		3.0	mg/L		02-MAY-17	R3712524
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.093		0.020	mg/L		26-APR-17	R3709205
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.093		0.050	mg/L		27-APR-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		26-APR-17	R3709205

* 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.

EC-MPN-CL	Water	MPN - E. coli	APHA 9223B

This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.
Recommended Holding Time:
Sample: 1 day
Reference: APHA

FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D

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

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-COL-CL	Water	Ammonia, Total (as N)	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the phenate colourimetric method.

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.

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**

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.

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3713386								
WG2520985-2 LCS								
Biochemical Oxygen Demand			91.5		%		85-115	27-APR-17
WG2520985-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	27-APR-17
EC-MPN-CL	**Water**							
Batch R3709314								
WG2518315-1 MB								
MPN - E. coli			<1		MPN/100mL		1	26-APR-17
FCC-MF-CL	**Water**							
Batch R3709336								
WG2518350-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	26-APR-17
NH3-COL-CL	**Water**							
Batch R3712669								
WG2520742-2 LCS								
Ammonia, Total (as N)			104.9		%		85-115	01-MAY-17
WG2520742-1 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	01-MAY-17
WG2520742-4 MS		**L1917509-3**						
Ammonia, Total (as N)			101.1		%		75-125	01-MAY-17
NO2-IC-N-CL	**Water**							
Batch R3709205								
WG2518225-6 LCS								
Nitrite (as N)			100.4		%		90-110	26-APR-17
WG2518225-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	26-APR-17
NO3-IC-N-CL	**Water**							
Batch R3709205								
WG2518225-6 LCS								
Nitrate (as N)			99.0		%		90-110	26-APR-17
WG2518225-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	26-APR-17
P-T-COL-CL	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-CL	**Water**							
Batch R3711142								
WG2520251-3 DUP		**L1917509-4**						
Phosphorus (P)-Total		0.0077	0.0082		mg/L	7.0	20	01-MAY-17
WG2520251-2 LCS								
Phosphorus (P)-Total			93.8		%		80-120	01-MAY-17
WG2520251-1 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	01-MAY-17
WG2520251-4 MS		**L1917509-4**						
Phosphorus (P)-Total			94.4		%		70-130	01-MAY-17
PO4-DO-COL-CL	**Water**							
Batch R3709358								
WG2518367-6 LCS								
Orthophosphate-Dissolved (as P)			90.9		%		80-120	26-APR-17
WG2518367-5 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	26-APR-17
TSS-CL	**Water**							
Batch R3712524								
WG2520644-2 LCS								
Total Suspended Solids			112.4		%		85-115	01-MAY-17
WG2520644-8 LCS								
Total Suspended Solids			88.0		%		85-115	01-MAY-17
WG2520644-1 MB								
Total Suspended Solids			<3.0		mg/L		3	01-MAY-17
WG2520644-7 MB								
Total Suspended Solids			<3.0		mg/L		3	01-MAY-17

Quality Control Report

Legend:

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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

NAUTILUS ENVIRONMENTAL

ATTN: Lyudmyla Shvets
ALS Laboratory Group
2559 29th St. N.E.
Calgary, Alberta
Canada T1Y 7B5

Received: 2017/04/26, 1200
Report Date: 2017/05/03
Version: FINAL

Test Report

Client: ALS106
Reference: 1617-0911
Billing: L1917509

Senior Verifier

NAUTILUS ENVIRONMENTAL

Enterococcus Test Report

Result Summary

Client: ALS106
Reference: 1617-0911

Client: ALS Laboratory Group; operation Calgary
Sample: L1917509-1 WWTP EFFLUENT -UV THROUGH, L1917509-2 COLUMBIA RIVER UPSTREAM, L1917509-3 COLUMBIA RIVER DOWNSTREAM, L1917509-4 COLUMBIA RIVER SIDE CHANNEL
Collection: collected on 2017/04/25 at 1400-1500 by not given
Receipt: received on 2017/04/26 at 1200 by EJ
Containers: received 4 x 250 mL bottles at 12 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

Analysis: started on 2017/04/26 by HS; ended on 2017/04/27 by HS

Result:

Sample	Client Code	*Enterococcus* (MPN/100mL)
01	L1917509-1 WWTP EFFLUENT -UV THROUGH	<1
02	L1917509-2 COLUMBIA RIVER UPSTREAM	12.1
03	L1917509-3 COLUMBIA RIVER DOWNSTREAM	5.2
04	L1917509-4 COLUMBIA RIVER SIDE CHANNEL	1.0

Notes: MPN, most probable number

Comments: Test incubation was 24 hours at 41 ± 1°C
Reagents performed as expected

Method: *Enterococcus* by Most Probable Number method (WTRQ-ME-009)
Reference: Multiple-tube Technique, variation of 9230 B. (IDEXX Enterolert media)
Standard Methods for Examination of Water and Wastewater, 22nd ed. 2012. Edited by: E.W. Rice, L.S. Clesceri, A.E. Greenberg, and A.D. Eaton. APHA, AWWA, WEF, Washington. (ISBN 978-087553-013-0).

The test data and results are authorized and verified correct.

ALS Environmental

Chain of Custody / Analytical F
Canada Toll Free: 1 800 (
www.alsglobal.cor

L1917509-COFC

COC # _____

Page 1 of 1

Report To		Report Format / Distribution		Turnaround analysis subject to availability
Company:	Kicking Horse Mountain Resort Utility Corporation	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-8442 Fax:	Email 3:	mskyring@kickinghorseresort.com	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	Week - 2017 Spring EMS program - WW	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact:	LS	Sampler: TJ/CV

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-NO2	Total P	Ortho P	Fecal Coliform	Enterococci	E. Coli			Number of Containers
	WWTP Effluent - UV trough Temp: 12 pH: 6.8	APR 25	2:00PM	Water	X	X	X	X	X	X	X	X	X	X			5
	Columbia River Upstream Temp: 11 pH: 7.8	APR 25	3:00PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Down stream Temp: 11 pH: 7.8	APR 25	3:00PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Side Channel Temp: 11 pH: 7.8	APR 25	3:00PM	Water		X	X	X	X	X	X	X	X	X			4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date: 4/26	Time: 10:03	Temperature: 6 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 03-MAY-17
Report Date: 16-MAY-17 15:36 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1920544

Project P.O. #: NOT SUBMITTED
Job Reference: WEEK 4 - 2017 SPRING EMS PROGRAM - WW
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1920544-1 WWTP EFFLUENT - UV TROUGH TEMP: 12 PH: 6.6							
Sampled By: TJ on 02-MAY-17 @ 13:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.080		0.050	mg/L		06-MAY-17	R3716709
Biochemical Oxygen Demand	2.5		2.0	mg/L		03-MAY-17	R3717803
Orthophosphate-Dissolved (as P)	0.791	DLA	0.050	mg/L		03-MAY-17	R3715219
Enterococcus	See Attached					03-MAY-17	R3725364
Coliform Bacteria - Fecal	8	OCR	1	CFU/100mL		03-MAY-17	R3715179
MPN - E. coli	6	OCR	1	MPN/100mL		03-MAY-17	R3715165
Phosphorus (P)-Total	1.06	DLA	0.050	mg/L		09-MAY-17	R3717247
Total Suspended Solids	4.7		3.0	mg/L		08-MAY-17	R3717760
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	14.5		0.020	mg/L		03-MAY-17	R3715508
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	14.6		0.050	mg/L		05-MAY-17	
Nitrite in Water by IC							
Nitrite (as N)	0.043		0.010	mg/L		03-MAY-17	R3715508
L1920544-2 COLUMBIA RIVER UPSTREAM TEMP: 13 PH: 7.8							
Sampled By: TJ on 02-MAY-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		06-MAY-17	R3716709
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		03-MAY-17	R3715219
Coliform Bacteria - Fecal	35	OCR	1	CFU/100mL		03-MAY-17	R3715179
MPN - E. coli	34	OCR	1	MPN/100mL		03-MAY-17	R3715165
Phosphorus (P)-Total	0.0094		0.0050	mg/L		09-MAY-17	R3717247
Total Suspended Solids	6.7		3.0	mg/L		08-MAY-17	R3717760
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.129		0.020	mg/L		03-MAY-17	R3715508
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.129		0.050	mg/L		05-MAY-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		03-MAY-17	R3715508
L1920544-3 COLUMBIA RIVER DOWN STREAM TEMP: 12 PH: 7.8							
Sampled By: TJ on 02-MAY-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		06-MAY-17	R3716709
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		03-MAY-17	R3715219
Coliform Bacteria - Fecal	19	OCR	1	CFU/100mL		03-MAY-17	R3715179
MPN - E. coli	18	OCR	1	MPN/100mL		03-MAY-17	R3715165
Phosphorus (P)-Total	0.0083		0.0050	mg/L		09-MAY-17	R3717247
Total Suspended Solids	4.0		3.0	mg/L		08-MAY-17	R3717760
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.151		0.020	mg/L		03-MAY-17	R3715508
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.151		0.050	mg/L		05-MAY-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		03-MAY-17	R3715508

* 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
L1920544-4 COLUMBIA RIVER SIDE CHANNEL TEMP: 13 PH: 7.8							
Sampled By: TJ on 02-MAY-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		06-MAY-17	R3716709
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		03-MAY-17	R3715219
Coliform Bacteria - Fecal	4	OCR	1	CFU/100mL		03-MAY-17	R3715179
MPN - E. coli	3	OCR	1	MPN/100mL		03-MAY-17	R3715165
Phosphorus (P)-Total	0.0167		0.0050	mg/L		09-MAY-17	R3717247
Total Suspended Solids	8.0		3.0	mg/L		08-MAY-17	R3717760
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.110		0.020	mg/L		03-MAY-17	R3715508
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.110		0.050	mg/L		05-MAY-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		03-MAY-17	R3715508

* 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.

EC-MPN-CL	Water	MPN - E. coli	APHA 9223B

This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.
Recommended Holding Time:
Sample: 1 day
Reference: APHA

FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D

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

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-COL-CL	Water	Ammonia, Total (as N)	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the phenate colourimetric method.

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.

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**

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.

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3717803								
WG2524395-4 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	03-MAY-17
EC-MPN-CL	**Water**							
Batch R3715165								
WG2522538-4 MB								
MPN - E. coli			<1		MPN/100mL		1	03-MAY-17
FCC-MF-CL	**Water**							
Batch R3715179								
WG2522546-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	03-MAY-17
NH3-COL-CL	**Water**							
Batch R3716709								
WG2523631-10 LCS								
Ammonia, Total (as N)			108.5		%		85-115	06-MAY-17
WG2523631-6 LCS								
Ammonia, Total (as N)			106.0		%		85-115	06-MAY-17
WG2523631-5 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	06-MAY-17
WG2523631-9 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	06-MAY-17
WG2523631-12 MS		**L1920544-4**						
Ammonia, Total (as N)			102.6		%		75-125	06-MAY-17
NO2-IC-N-CL	**Water**							
Batch R3715508								
WG2522920-3 DUP		**L1920544-4**						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	03-MAY-17
WG2522920-2 LCS								
Nitrite (as N)			101.3		%		90-110	03-MAY-17
WG2522920-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	03-MAY-17
NO3-IC-N-CL	**Water**							
Batch R3715508								
WG2522920-3 DUP		**L1920544-4**						
Nitrate (as N)		0.110	0.108		mg/L	1.7	20	03-MAY-17
WG2522920-2 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-CL	**Water**							
Batch R3715508								
WG2522920-2 LCS								
Nitrate (as N)			101.3		%		90-110	03-MAY-17
WG2522920-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	03-MAY-17
P-T-COL-CL	**Water**							
Batch R3717247								
WG2524850-2 LCS								
Phosphorus (P)-Total			95.2		%		80-120	09-MAY-17
WG2524850-1 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	09-MAY-17
PO4-DO-COL-CL	**Water**							
Batch R3715219								
WG2521767-2 LCS								
Orthophosphate-Dissolved (as P)			94.2		%		80-120	03-MAY-17
WG2521767-1 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	03-MAY-17
TSS-CL	**Water**							
Batch R3717760								
WG2524415-2 LCS								
Total Suspended Solids			104.0		%		85-115	08-MAY-17
WG2524415-1 MB								
Total Suspended Solids			<3.0		mg/L		3	08-MAY-17

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

NAUTILUS ENVIRONMENTAL

ATTN: Lyudmyla Shvets
ALS Laboratory Group
2559 29th St. N.E.
Calgary, Alberta
Canada T1Y 7B5

Received: 2017/05/03, 1200
Report Date: 2017/05/16
Version: FINAL

Test Report

Client: ALS106
Reference: 1617-0929
Billing: L1920544

Senior Verifier

NAUTILUS ENVIRONMENTAL

Enterococcus Test Report

Result Summary

Client: ALS106
Reference: 1617-0929

Client: ALS Laboratory Group; operation Calgary

Sample: L1920544-1 WWTP EFFLUENT -UV TROUGH TEMP: 12 PH: 6.6

Collection: collected on 2017/05/02 at 1300 by not given
Receipt: received on 2017/05/03 at 1200 by EJ
Containers: received 1 x 250 mL bottle at 11 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

Analysis: started on by HS; ended on by JN

Result:

Sample	Client Code	*Enterococcus* (MPN/100mL)
01	L1920544-1 WWTP EFFLUENT -UV TROUGH TEMP: 12 PH: 6.6	2.0

Notes: MPN, most probable number

Comments: Test incubation was 24 hours at 41 ± 1°C
Reagents performed as expected

Method: *Enterococcus* by Most Probable Number method (WTRQ-ME-009)
Reference: Multiple-tube Technique, variation of 9230 B. (IDEXX Enterolert media)
Standard Methods for Examination of Water and Wastewater, 22nd ed. 2012. Edited by: E.W. Rice, L.S. Clesceri, A.E. Greenberg, and A.D. Eaton. APHA, AWWA, WEF, Washington. (ISBN 978-087553-013-0).

The test data and results are authorized and verified correct.

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1920544-COFC

Report To		Report Format / Distribution		Service Level (Availability)
Company:	Kicking Horse Mountain Resort Utility Corporation	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1: tjobin@kickinghorseresort.com		○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2: pmajer@skircr.com		○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-8442 Fax:	Email 3: mskyring@kickinghorseresort.com		
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	Week4 - 2017 Spring EMS program - WW	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact: LS	Sampler: TJ/[redacted]	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-NO2	Total P	Ortho P	Fecal Coliform	Enterococci	E. Coli			Number of Containers
	WWTP Effluent - UV trough Temp: 12 pH: 6.6	MAY 2	1PM	Water	X	X	X	X	X	X	X	X	X	X			5
	Columbia River Upstream Temp: 13 pH: 7.8	11	2PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Down stream Temp: 12 pH: 7.8	11	2PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Side Channel Temp: 13 pH: 7.8	11	2PM	Water		X	X	X	X	X	X	X	X	X			4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			MM	3-Apr-17	9:20	7 °C				

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 10-MAY-17
Report Date: 23-MAY-17 18:10 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1923888

Project P.O. #: NOT SUBMITTED
Job Reference: WEEK - 2017 SPRING EMS PROGRAM - WW
C of C Numbers:
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1923888-1 WWTP EFFLUENT - UV TROUGH							
Sampled By: TJ/MS on 09-MAY-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.084		0.050	mg/L		13-MAY-17	R3720929
Biochemical Oxygen Demand	<2.0		2.0	mg/L		10-MAY-17	R3722463
Orthophosphate-Dissolved (as P)	1.01	DLA	0.050	mg/L		10-MAY-17	R3718748
Enterococcus	See Attached					10-MAY-17	R3730262
Coliform Bacteria - Fecal	2	OCR	1	CFU/100mL		10-MAY-17	R3719127
MPN - E. coli	<1		1	MPN/100mL		10-MAY-17	R3719121
Phosphorus (P)-Total	1.22	DLA	0.10	mg/L		13-MAY-17	R3720983
Total Suspended Solids	4.0		3.0	mg/L		15-MAY-17	R3725370
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	12.1		0.020	mg/L		10-MAY-17	R3719285
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	12.1		0.050	mg/L		12-MAY-17	
Nitrite in Water by IC							
Nitrite (as N)	0.052		0.010	mg/L		10-MAY-17	R3719285
L1923888-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/MS on 09-MAY-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		13-MAY-17	R3720929
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		10-MAY-17	R3718748
Enterococcus	See Attached					10-MAY-17	R3730262
Coliform Bacteria - Fecal	16	OCR	1	CFU/100mL		10-MAY-17	R3719127
MPN - E. coli	15	OCR	1	MPN/100mL		10-MAY-17	R3719121
Phosphorus (P)-Total	0.0667		0.0050	mg/L		13-MAY-17	R3720983
Total Suspended Solids	56.7		3.0	mg/L		15-MAY-17	R3725370
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.288		0.020	mg/L		10-MAY-17	R3719285
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.288		0.050	mg/L		12-MAY-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		10-MAY-17	R3719285
L1923888-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 09-MAY-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.060		0.050	mg/L		13-MAY-17	R3720929
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		10-MAY-17	R3718748
Enterococcus	See Attached					10-MAY-17	R3730262
Coliform Bacteria - Fecal	<1		1	CFU/100mL		10-MAY-17	R3719127
MPN - E. coli	<1		1	MPN/100mL		10-MAY-17	R3719121
Phosphorus (P)-Total	0.0217		0.0050	mg/L		13-MAY-17	R3720983
Total Suspended Solids	21.3		3.0	mg/L		15-MAY-17	R3725370
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.253		0.020	mg/L		10-MAY-17	R3719285
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.253		0.050	mg/L		12-MAY-17	

* 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
L1923888-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 09-MAY-17 @ 15:00							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		10-MAY-17	R3719285
L1923888-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ/MS on 09-MAY-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.135		0.050	mg/L		13-MAY-17	R3720929
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		10-MAY-17	R3718748
Enterococcus	See Attached					10-MAY-17	R3730262
Coliform Bacteria - Fecal	21	OCR	1	CFU/100mL		10-MAY-17	R3719127
MPN - E. coli	13	OCR	1	MPN/100mL		10-MAY-17	R3719121
Phosphorus (P)-Total	0.0243		0.0050	mg/L		13-MAY-17	R3720983
Total Suspended Solids	25.3		3.0	mg/L		15-MAY-17	R3725370
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.297		0.020	mg/L		10-MAY-17	R3719285
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.297		0.050	mg/L		12-MAY-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		10-MAY-17	R3719285

* 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.

EC-MPN-CL	Water	MPN - E. coli	APHA 9223B

This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.
Recommended Holding Time:
Sample: 1 day
Reference: APHA

FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D

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

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-COL-CL	Water	Ammonia, Total (as N)	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the phenate colourimetric method.

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.

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**

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.

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3722463								
WG2528441-2 LCS								
Biochemical Oxygen Demand			98.4		%		85-115	10-MAY-17
WG2528441-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	10-MAY-17
EC-MPN-CL	**Water**							
Batch R3719121								
WG2526991-1 MB								
MPN - E. coli			<1		MPN/100mL		1	10-MAY-17
FCC-MF-CL	**Water**							
Batch R3719127								
WG2527029-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	10-MAY-17
NH3-COL-CL	**Water**							
Batch R3720929								
WG2527932-10 LCS								
Ammonia, Total (as N)			104.1		%		85-115	13-MAY-17
WG2527932-9 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	13-MAY-17
NO2-IC-N-CL	**Water**							
Batch R3719285								
WG2527206-2 LCS								
Nitrite (as N)			101.7		%		90-110	10-MAY-17
WG2527206-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	10-MAY-17
NO3-IC-N-CL	**Water**							
Batch R3719285								
WG2527206-2 LCS								
Nitrate (as N)			98.8		%		90-110	10-MAY-17
WG2527206-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	10-MAY-17
P-T-COL-CL	**Water**							
Batch R3720983								
WG2527942-10 LCS								
Phosphorus (P)-Total			98.7		%		80-120	13-MAY-17
WG2527942-14 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-CL	**Water**							
Batch R3720983								
WG2527942-14 LCS								
Phosphorus (P)-Total			102.1		%		80-120	13-MAY-17
WG2527942-13 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	13-MAY-17
WG2527942-9 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	13-MAY-17
PO4-DO-COL-CL	**Water**							
Batch R3718748								
WG2526533-3 DUP		**L1923888-4**						
Orthophosphate-Dissolved (as P)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	10-MAY-17
WG2526533-2 LCS								
Orthophosphate-Dissolved (as P)			99.4		%		80-120	10-MAY-17
WG2526533-1 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	10-MAY-17
WG2526533-4 MS		**L1923888-4**						
Orthophosphate-Dissolved (as P)			96.5		%		70-130	10-MAY-17
TSS-CL	**Water**							
Batch R3725370								
WG2529046-2 LCS								
Total Suspended Solids			86.2		%		85-115	15-MAY-17
WG2529046-1 MB								
Total Suspended Solids			<3.0		mg/L		3	15-MAY-17

Quality Control Report

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

NAUTILUS ENVIRONMENTAL

ATTN: Lyudmyla Shvets
ALS Laboratory Group
2559 29th St. N.E.
Calgary, Alberta
Canada T1Y 7B5

Received: 2017/05/10, 1115
Report Date: 2017/05/12
Version: FINAL

Test Report

Client: ALS106
Reference: 1617-0954
Billing: L1923888

Senior Verifier

NAUTILUS ENVIRONMENTAL

Enterococcus Test Report

Result Summary

Client: ALS106
Reference: 1617-0954

Client: ALS Laboratory Group; operation Calgary

Samples: L1923888-1 WWTP EFFLUENT-UV TROUGH, L1923888-2 COLUMBIA RIVER UPSTREAM, L1923888-3 COLUMBIA RIVER DOWN STREAM, L1923888-4 RIVER SIDE CHANNEL
Collection: collected on 2017/05/09 at 1400
Receipt: received on 2017/05/10 at 1115 by JW
Containers: received 4 x 250ml bottles at 9.3 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

Analysis: started on 2017/05/10 by JN; ended on 2017/05/11 by JN

Result:

Sample	Client Code	*Enterococcus* (MPN/100mL)
01	L1923888-1 WWTP EFFLUENT-UV TROUGH	<1.0
02	L1923888-2 COLUMBIA RIVER UPSTREAM	<1.0
03	L1923888-3 COLUMBIA RIVER DOWN STREAM	1.0
04	L1923888-4 RIVER SIDE CHANNEL	<1.0

Notes: MPN, most probable number

Comments: Test incubation was 24 hours at 41 ± 1°C
Reagents performed as expected

Method: *Enterococcus* by Most Probable Number method (WTRQ-ME-009)
Reference: Multiple-tube Technique, variation of 9230 B. (IDEXX Enterolert media)
Standard Methods for Examination of Water and Wastewater, 22nd ed. 2012. Edited by: E.W. Rice, L.S. Clesceri, A.E. Greenberg, and A.D. Eaton. APHA, AWWA, WEF, Washington. (ISBN 978-087553-013-0).

The test data and results are authorized and verified correct.

ALS Environmer

L1923888-COFC

of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # _____

Page 1 of 1

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Kicking Horse Mountain Resort Utility Corporation	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250 344 8442 Fax:	Email 3:	mskyring@kickinghorseresort.com	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	Week - 2017 Spring EMS program - WW	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)	L1923888	ALS Contact: LS	Sampler: TJ/MS	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-NO2	Total P	Ortho P	Fecal Coliform	Enterococci	E. Coli			Number of Containers
	WWTP Effluent - UV trough Temp: 13 pH: 6.8	MAY 9	2PM	Water	X	X	X	X	X	X	X	X	X	X			5
	Columbia River Upstream Temp: 9 pH: 7.7	MAY 9	3PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Down stream Temp: 9 pH: 8.0	MAY 9	3PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Side Channel Temp: 9 pH: 7.6	MAY 9	2PM	Water		X	X	X	X	X	X	X	X	X			4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh:mm)	Received by:	Date:	Time:	Temperature: °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
				5/10						

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 30-JUN-17
Report Date: 08-JUL-17 13:12 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1951617

Project P.O. #: NOT SUBMITTED
Job Reference: RCR - KICKING HORSE MOUNTAIN RESORT
C of C Numbers:
Legal Site Desc:

Nancy Sonompil
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1951617-1 UV TROUGH							
Sampled By: TJ on 28-JUN-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		30-JUN-17	R3765853
Orthophosphate-Dissolved (as P)	1.07	DLA	0.10	mg/L		01-JUL-17	R3760144
Phosphorus (P)-Total	1.11	DLA	0.10	mg/L		06-JUL-17	R3767429
Total Suspended Solids	3.7		3.0	mg/L		04-JUL-17	R3765569

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
EXTEMP	RECEIVED AT 17C - Samples Received with temperature >15 Degrees C
SPL	TOTAL P - Sample was Preserved at the laboratory

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-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.

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.

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:

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.

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3765853								
WG2563647-3 DUP		**L1951617-1**						
Biochemical Oxygen Demand		<2.0	<2.0	RPD-NA	mg/L	N/A	20	30-JUN-17
WG2563647-2 LCS								
Biochemical Oxygen Demand			88.2		%		85-115	30-JUN-17
WG2563647-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	30-JUN-17
P-T-COL-CL	**Water**							
Batch R3767429								
WG2565395-2 LCS								
Phosphorus (P)-Total			106.3		%		80-120	06-JUL-17
WG2565395-1 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	06-JUL-17
PO4-DO-COL-CL	**Water**							
Batch R3760144								
WG2561340-5 LCS								
Orthophosphate-Dissolved (as P)			100.2		%		80-120	01-JUL-17
WG2561340-4 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	01-JUL-17
TSS-CL	**Water**							
Batch R3765569								
WG2562426-2 LCS								
Total Suspended Solids			106.0		%		85-115	04-JUL-17
WG2562426-1 MB								
Total Suspended Solids			<3.0		mg/L		3	04-JUL-17

Quality Control Report

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS Environmental

L1951617-COFC

f Custody / Analytical Request Form
inada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # _____

Page 1 of 1

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-6003 Fax:	Email 3:	mskyring@kickinghorseresort.com	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	RCR - Kicking Horse Mountain Resort	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:	Q33059	
Lab Work Order # (lab use only)	L1951617	ALS Contact:	LS	Sampler: TJ

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	TSS	Fecal Coliform	[illegible]	ORTHO PHOSPHATE	TOTAL P	Number of Containers
	UV trough	JUNE 28, 17	2PM	Water	X	X	X		X	X	4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date: 6/30	Time: 9:05	Temperature: 17 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 27-JUL-17
Report Date: 02-AUG-17 14:46 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1965513

Project P.O. #: NOT SUBMITTED
Job Reference: RCR - KICKING HORSE MOUNTAIN RESORT
C of C Numbers:
Legal Site Desc:

Nancy Sonompil
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1965513-1 UV TROUGH							
Sampled By: TJ on 26-JUL-17 @ 12:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		27-JUL-17	R3786604
Orthophosphate-Dissolved (as P)	1.72	DLA	0.25	mg/L		28-JUL-17	R3784603
Coliform Bacteria - Fecal	9	OCR	1	CFU/100mL		27-JUL-17	R3784763
Phosphorus (P)-Total	2.08	DLA	0.50	mg/L		01-AUG-17	R3788243
Total Suspended Solids	<3.0		3.0	mg/L		29-JUL-17	R3785346

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
SPL	Sample was Preserved at the laboratory
ISCR:ST	Tot-P - Improper Sample Container Received: Subsamples Taken

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.

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.

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.

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:

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.

Quality Control Report

Workorder: L1965513 Report Date: 02-AUG-17

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3786604								
WG2582874-2 LCS								
Biochemical Oxygen Demand			89.7		%		85-115	27-JUL-17
WG2582874-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	27-JUL-17
FCC-MF-CL	**Water**							
Batch R3784763								
WG2580806-2 DUP		**L1965513-1**						
Coliform Bacteria - Fecal		9	8		CFU/100mL	12	65	27-JUL-17
WG2580806-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	27-JUL-17
P-T-COL-CL	**Water**							
Batch R3788243								
WG2583170-2 LCS								
Phosphorus (P)-Total			102.6		%		80-120	01-AUG-17
WG2583170-1 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	01-AUG-17
PO4-DO-COL-CL	**Water**							
Batch R3784603								
WG2580622-2 LCS								
Orthophosphate-Dissolved (as P)			107.1		%		80-120	28-JUL-17
WG2580622-1 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	28-JUL-17
TSS-CL	**Water**							
Batch R3785346								
WG2581191-2 LCS								
Total Suspended Solids			111.1		%		85-115	29-JUL-17
WG2581191-1 MB								
Total Suspended Solids			<3.0		mg/L		3	29-JUL-17

Quality Control Report

Legend:

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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1965513-COFC

Report To		Report Format / Distribution	Service Reque.
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1: tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2: pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-6003 Fax:	Email 3: mskyring@kickinghorseresort.com	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information	
Hardcopy of invoice with Report?	☐ Yes ☑ No	Job #: RCR - Kicking Horse Mountain Resort	
Company:	Resorts of the Canadian Rockies	PO / AFE:	
Contact:	Patrick Majer	LSD:	
Address:	1505 - 17th Ave SW Calgary AB		
Phone:	Fax:	Quote #: Q33059	
Lab Work Order # (lab use only)		ALS Contact: LS	Sampler: TJ

Analysis Request

Please indicate below Filtered, Preserved or both (F, P, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	TSS	Fecal Coliform	ORTHO PHOSPHATE	TOTAL P								Number of Containers
	UV trough	JULY 26, 17	12:00 PM	Water	X	X	X	X	X								4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
				7/27	9:42	10 °C				

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 30-AUG-17
Report Date: 07-SEP-17 09:19 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1983507

Project P.O. #: NOT SUBMITTED
Job Reference: RCR - KICKING HORSE MOUNTAIN RESORT
C of C Numbers:
Legal Site Desc:

Nancy Sonompil
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1983507-1 UV TROUGH - WASTE WATER							
Sampled By: TJ on 29-AUG-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		01-SEP-17	R3821001
Coliform Bacteria - Fecal	1	OCR	1	CFU/100mL		30-AUG-17	R3816815
Total Suspended Solids	<3.0		3.0	mg/L		05-SEP-17	R3820891

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
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.

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.

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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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:

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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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Quality Control Report

Workorder: L1983507 Report Date: 07-SEP-17

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3821001								
WG2609580-2 LCS								
Biochemical Oxygen Demand			94.4		%		85-115	01-SEP-17
WG2609580-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	01-SEP-17
FCC-MF-CL	**Water**							
Batch R3816815								
WG2607153-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	30-AUG-17
TSS-CL	**Water**							
Batch R3820891								
WG2609818-8 LCS								
Total Suspended Solids			92.3		%		85-115	05-SEP-17
WG2609818-7 MB								
Total Suspended Solids			<3.0		mg/L		3	05-SEP-17

Quality Control Report

Legend:

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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

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

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1983507-COFC

1

Report To		Report Format / Distribution	Service (ty)
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1: tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2: pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-6003 Fax:	Email 3: mskyring@kickinghorseresort.com	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #: RCR - Kicking Horse Mountain Resort	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Resorts of the Canadian Rockies	PO / AFE:	
Contact:	Patrick Majer	LSD:	
Address:	1505 - 17th Ave SW Calgary AB		
Phone:	Fax:	Quote #: Q33059	
Lab Work Order # (lab use only)		ALS Contact: LS	Sampler: TJ

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	TSS	Fecal Coliform	Total Coliform	Number of Containers
	UV trough - WASTEWATER	AUG 29	2 PM	Water	X	X	X		1
	* Bacteria bottle + Routine sample received. (2x Routine / 1 x bact) - mm 30-Aug-17								

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			MM	30-Aug-17	9:40	6 °C				

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 20-SEP-17
Report Date: 28-SEP-17 17:08 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1994075

Project P.O. #: NOT SUBMITTED
Job Reference: WEEK 1 - 2017 FALL EMS PROGRAM - WW
C of C Numbers:
Legal Site Desc:

Nancy Sonompil
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1994075-1 WWTP EFFLUENT - UV THROUGH							
Sampled By: TJ/MS on 19-SEP-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.072		0.050	mg/L		28-SEP-17	R3840495
Biochemical Oxygen Demand	<2.0		2.0	mg/L		20-SEP-17	R3837633
Orthophosphate-Dissolved (as P)	1.05	DLHC	0.10	mg/L		20-SEP-17	R3833758
Coliform Bacteria - Fecal	2	OCR	1	CFU/100mL		20-SEP-17	R3837128
MPN - E. coli	2	OCR	1	MPN/100mL		20-SEP-17	R3835333
Phosphorus (P)-Total	1.11	DLHC	0.10	mg/L	25-SEP-17	27-SEP-17	R3839507
Total Suspended Solids	6.0		3.0	mg/L		22-SEP-17	R3836571
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	24.6		0.020	mg/L		22-SEP-17	R3839033
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	24.6		0.050	mg/L		27-SEP-17	
Nitrite in Water by IC							
Nitrite (as N)	0.034		0.010	mg/L		22-SEP-17	R3839033
L1994075-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/MS on 19-SEP-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		28-SEP-17	R3840495
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		20-SEP-17	R3833758
Coliform Bacteria - Fecal	3	OCR	1	CFU/100mL		20-SEP-17	R3837128
MPN - E. coli	3	OCR	1	MPN/100mL		20-SEP-17	R3835333
Phosphorus (P)-Total	0.030		0.020	mg/L	25-SEP-17	27-SEP-17	R3839507
Total Suspended Solids	42.7		3.0	mg/L		22-SEP-17	R3836571
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.083		0.020	mg/L		22-SEP-17	R3839033
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.083		0.050	mg/L		27-SEP-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		22-SEP-17	R3839033
L1994075-3 COLUMBIA RIVER DOWNSTREAM							
Sampled By: TJ/MS on 19-SEP-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		28-SEP-17	R3840495
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		20-SEP-17	R3833758
Coliform Bacteria - Fecal	3	OCR	1	CFU/100mL		20-SEP-17	R3837128
MPN - E. coli	1	OCR	1	MPN/100mL		20-SEP-17	R3835333
Phosphorus (P)-Total	0.035		0.020	mg/L	25-SEP-17	27-SEP-17	R3839507
Total Suspended Solids	70.0		3.0	mg/L		22-SEP-17	R3836571
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.078		0.020	mg/L		22-SEP-17	R3839033
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.078		0.050	mg/L		27-SEP-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		22-SEP-17	R3839033

* 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
L1994075-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ/MS on 19-SEP-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		28-SEP-17	R3840495
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		20-SEP-17	R3833758
Coliform Bacteria - Fecal	5	OCR	1	CFU/100mL		20-SEP-17	R3837128
MPN - E. coli	2	OCR	1	MPN/100mL		20-SEP-17	R3835333
Phosphorus (P)-Total	0.027		0.020	mg/L	25-SEP-17	27-SEP-17	R3839507
Total Suspended Solids	24.7		3.0	mg/L		22-SEP-17	R3836571
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.071		0.020	mg/L		22-SEP-17	R3839033
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.071		0.050	mg/L		27-SEP-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		22-SEP-17	R3839033

* 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-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.

EC-MPN-CL	Water	MPN - E. coli	APHA 9223B

This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.
Recommended Holding Time:
Sample: 1 day
Reference: APHA

FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D

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

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-ED	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.

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

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

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

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3837633								
WG2624639-2 LCS								
Biochemical Oxygen Demand			95.9		%		85-115	20-SEP-17
WG2624639-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	20-SEP-17
EC-MPN-CL	**Water**							
Batch R3835333								
WG2622073-1 MB								
MPN - E. coli			<1		MPN/100mL		1	20-SEP-17
FCC-MF-CL	**Water**							
Batch R3837128								
WG2624164-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	20-SEP-17
NH3-F-CL	**Water**							
Batch R3840495								
WG2627808-10 DUP		**L1994075-4**						
Ammonia, Total (as N)		<0.050	<0.050	RPD-NA	mg/L	N/A	20	28-SEP-17
WG2627808-11 LCS								
Ammonia, Total (as N)			103.1		%		85-115	28-SEP-17
WG2627808-9 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	28-SEP-17
WG2627808-12 MS		**L1994075-4**						
Ammonia, Total (as N)			110.5		%		75-125	28-SEP-17
NO2-IC-N-CL	**Water**							
Batch R3839033								
WG2626260-2 LCS								
Nitrite (as N)			106.8		%		90-110	22-SEP-17
WG2626260-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	22-SEP-17
NO3-IC-N-CL	**Water**							
Batch R3839033								
WG2626260-2 LCS								
Nitrate (as N)			104.3		%		90-110	22-SEP-17
WG2626260-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	22-SEP-17
P-T-COL-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-ED	**Water**							
Batch R3839507								
WG2624736-2 LCS		**KONELAB_TP**						
Phosphorus (P)-Total			98.3		%		80-120	27-SEP-17
WG2624736-9 LCS		**KONELAB_TP**						
Phosphorus (P)-Total			97.4		%		80-120	27-SEP-17
WG2624736-1 MB								
Phosphorus (P)-Total			<0.020		mg/L		0.02	27-SEP-17
WG2624736-10 MB								
Phosphorus (P)-Total			<0.020		mg/L		0.02	27-SEP-17
PO4-DO-COL-CL	**Water**							
Batch R3833758								
WG2620669-2 LCS								
Orthophosphate-Dissolved (as P)			96.0		%		80-120	20-SEP-17
WG2620669-1 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	20-SEP-17
TSS-CL	**Water**							
Batch R3836571								
WG2623335-14 LCS								
Total Suspended Solids			102.2		%		85-115	22-SEP-17
WG2623335-13 MB								
Total Suspended Solids			<3.0		mg/L		3	22-SEP-17

Quality Control Report

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668
www.alsglobal.com

COC #

L1994075-COFC

Page 1 of 1

Report To		Report Format / Distribution				Turnaround Time (TAT) Requested (analysis subject to availability)
Company:	Kicking Horse Mountain Resort Utility Corporation	☑ Standard	☐ Other			☐ Regular (5-7 Business Days)
Contact:	Travis Jobin	☐ PDF	☐ Excel	☐ Digital	☑ Fax	☐ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com			☐ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com			☐ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-8442 Fax:	Email 3:	mskyring@kickinghorseresort.com			
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information				Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	Week 1 - 2017 Fall EMS program - WW			Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Resorts of the Canadian Rockies	PO / AFE:				
Contact:	Patrick Majer	LSD:				
Address:	1505 - 17th Ave SW Calgary AB					
Phone:	Fax:	Quote #:				
Lab Work Order # (lab use only)		ALS Contact:	LS	Sampler:	TJ/MS	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-NO2	Total P	Ortho P	Fecal Coliform	Enterococci	E. Coli			Number of Containers
	WWTP Effluent - UV trough Temp: 16 pH: 6.5	9/14	2pm	Water	X	X	X	X	X	X	X	X	X	X			5
	Columbia River Upstream Temp: 12 pH: 7.6		2pm	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Down stream Temp: 12 pH: 7.6		3pm	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Side Channel Temp: 12 pH: 7.6		3pm	Water		X	X	X	X	X	X	X	X	X			4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
				9/20	9:12	5 °C				

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 28-SEP-17
Report Date: 05-OCT-17 19:42 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L1998834

Project P.O. #: NOT SUBMITTED
Job Reference: WEEK 2 - 2017 FALL EMS PROGRAM - WW
C of C Numbers:
Legal Site Desc:

Nancy Sonompil
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1998834-1 WWTP EFFLUENT UV THROUGH							
Sampled By: TJ/MS on 27-SEP-17 @ 13:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.074		0.050	mg/L		05-OCT-17	R3847533
Biochemical Oxygen Demand	<2.0		2.0	mg/L		28-SEP-17	R3845153
Orthophosphate-Dissolved (as P)	1.57	DLHC	0.25	mg/L		28-SEP-17	R3840821
Enterococcus	See Attached					28-SEP-17	R3846682
Coliform Bacteria - Fecal	4	OCR	1	CFU/100mL		28-SEP-17	R3841666
MPN - E. coli	<1		1	MPN/100mL		28-SEP-17	R3841257
Phosphorus (P)-Total	1.85		0.20	mg/L		04-OCT-17	R3846019
Total Suspended Solids	10.0		3.0	mg/L		03-OCT-17	R3844633
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	23.7		0.020	mg/L		28-SEP-17	R3845027
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	23.7		0.050	mg/L		03-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	0.028		0.010	mg/L		28-SEP-17	R3845027
L1998834-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/MS on 27-SEP-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		05-OCT-17	R3847533
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		28-SEP-17	R3840821
Enterococcus	See Attached					28-SEP-17	R3846682
Coliform Bacteria - Fecal	25	DLM	5	CFU/100mL		28-SEP-17	R3841666
MPN - E. coli	13	OCR	1	MPN/100mL		28-SEP-17	R3841257
Phosphorus (P)-Total	0.0925		0.0020	mg/L		30-SEP-17	R3841688
Total Suspended Solids	123		3.0	mg/L		03-OCT-17	R3844633
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.079		0.020	mg/L		28-SEP-17	R3845027
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.079		0.050	mg/L		03-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		28-SEP-17	R3845027
L1998834-3 COLUMBIA RIVER DOWNSTREAM							
Sampled By: TJ/MS on 27-SEP-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		05-OCT-17	R3847533
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		28-SEP-17	R3840821
Enterococcus	See Attached					28-SEP-17	R3846682
Coliform Bacteria - Fecal	20	DLM	5	CFU/100mL		28-SEP-17	R3841666
MPN - E. coli	5	OCR	1	MPN/100mL		28-SEP-17	R3841257
Phosphorus (P)-Total	0.0761		0.0020	mg/L		30-SEP-17	R3841688
Total Suspended Solids	81.3		3.0	mg/L		03-OCT-17	R3844633
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.072		0.020	mg/L		28-SEP-17	R3845027
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.072		0.050	mg/L		03-OCT-17	

* 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
L1998834-3 COLUMBIA RIVER DOWNSTREAM							
Sampled By: TJ/MS on 27-SEP-17 @ 15:00							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		28-SEP-17	R3845027
L1998834-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ/MS on 27-SEP-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		05-OCT-17	R3847533
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		28-SEP-17	R3840821
Enterococcus	See Attached					28-SEP-17	R3846682
Coliform Bacteria - Fecal	10	DLM	5	CFU/100mL		28-SEP-17	R3841666
MPN - E. coli	2	OCR	1	MPN/100mL		28-SEP-17	R3841257
Phosphorus (P)-Total	0.115		0.020	mg/L		30-SEP-17	R3841784
Total Suspended Solids	123		3.0	mg/L		03-OCT-17	R3844633
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.091		0.020	mg/L		28-SEP-17	R3845027
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.091		0.050	mg/L		03-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		28-SEP-17	R3845027

* 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).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
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.

EC-MPN-CL	Water	MPN - E. coli	APHA 9223B

This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.
Recommended Holding Time:
Sample: 1 day
Reference: APHA

FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D

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

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-PRES-COL-VA	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.
Samples with very high dissolved solids (i.e. seawaters, brackish waters) may produce a negative bias by this method. Alternate methods are available for these types of samples.

Arsenic (5+), at elevated levels, is a positive interference on colourimetric phosphate analysis.

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:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

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

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3845153								
WG2631175-6 DUP		**L1998834-1**						
Biochemical Oxygen Demand		<2.0	<2.0	RPD-NA	mg/L	N/A	20	28-SEP-17
WG2631175-5 LCS								
Biochemical Oxygen Demand			93.4		%		85-115	28-SEP-17
WG2631175-4 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	28-SEP-17
EC-MPN-CL	**Water**							
Batch R3841257								
WG2628723-1 MB								
MPN - E. coli			<1		MPN/100mL		1	28-SEP-17
FCC-MF-CL	**Water**							
Batch R3841666								
WG2629172-3 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	28-SEP-17
NH3-F-CL	**Water**							
Batch R3847533								
WG2633330-3 LCS								
Ammonia, Total (as N)			107.2		%		85-115	05-OCT-17
WG2633330-7 LCS								
Ammonia, Total (as N)			100.9		%		85-115	05-OCT-17
WG2633330-1 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	05-OCT-17
WG2633330-5 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	05-OCT-17
NO2-IC-N-CL	**Water**							
Batch R3845027								
WG2631170-14 LCS								
Nitrite (as N)			105.1		%		90-110	28-SEP-17
WG2631170-13 MB								
Nitrite (as N)			<0.010		mg/L		0.01	28-SEP-17
NO3-IC-N-CL	**Water**							
Batch R3845027								
WG2631170-14 LCS								
Nitrate (as N)			104.1		%		90-110	28-SEP-17
WG2631170-13 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-CL	**Water**							
Batch R3845027								
WG2631170-13 MB								
Nitrate (as N)			<0.020		mg/L		0.02	28-SEP-17
P-T-PRES-COL-VA	**Water**							
Batch R3841688								
WG2629007-6 CRM		**VA-ERA-PO4**						
Phosphorus (P)-Total			103.1		%		80-120	30-SEP-17
WG2629007-5 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	30-SEP-17
Batch R3841784								
WG2629089-2 CRM		**VA-ERA-PO4**						
Phosphorus (P)-Total			98.4		%		80-120	30-SEP-17
WG2629089-1 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	30-SEP-17
Batch R3846019								
WG2630867-2 CRM		**VA-ERA-PO4**						
Phosphorus (P)-Total			90.6		%		80-120	04-OCT-17
WG2630867-1 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	04-OCT-17
PO4-DO-COL-CL	**Water**							
Batch R3840821								
WG2627939-2 LCS								
Orthophosphate-Dissolved (as P)			113.9		%		80-120	28-SEP-17
WG2627939-1 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	28-SEP-17
TSS-CL	**Water**							
Batch R3844633								
WG2630839-5 LCS								
Total Suspended Solids			91.6		%		85-115	03-OCT-17
WG2630839-4 MB								
Total Suspended Solids			<3.0		mg/L		3	03-OCT-17

Quality Control Report

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

Microbial Test Results

Samples collected September 27, 2017

Final Report

October 4, 2017

Submitted to: **ALS Environmental**
Calgary, AB

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

SAMPLE INFORMATION

Sample ID/ Internal ID	Dates			Receipt temperature
	Collected	Received	*Enterococcus* test initiation	
L1998834-1 WWTP EFFLUENT UV TROUGH/ 1718-0227-01	27-Sept-17	28-Sept-17 at 1150h	28-Sept-17 at 1220h	9°C
L19988834-2 COLUMBIA RIVER UPSTREAM/ 1718-0227-02	27-Sept-17	28-Sept-17 at 1150h	28-Sept-17 at 1220h	9°C
L1998834-3 COLUMBIA RIVER DOWNSTREAM/ 1718-0227-03	27-Sept-17	28-Sept-17 at 1150h	28-Sept-17 at 1220h	9°C
L1998834-4 COLUMBIA RIVER SIDE CHANNEL/ 1718-0227-04	27-Sept-17	28-Sept-17 at 1150h	28-Sept-17 at 1220h	9°C

TEST TYPES

- *Enterococcus* enumeration test

RESULTS

Microbial test results

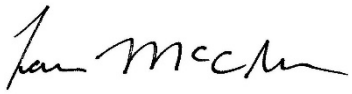
Sample ID	MPN/100 mL
	Enterococcus
L1998834-1 WWTP EFFLUENT UV TROUGH	139.1
L19988834-2 COLUMBIA RIVER UPSTREAM	25.6
L1998834-3 COLUMBIA RIVER DOWNSTREAM	13.2
L1998834-4 COLUMBIA RIVER SIDE CHANNEL	10.9

MPN = Most Probable Number

QA/QC

QA/QC summary	*Enterococcus*
Protocol deviations	None
Control performance	Acceptable
Test performance	Valid

Report By:
Leila Oosterbroek, BSc
Environmental Scientist



Reviewed By:
Tamara McClure, BSc
Quality Assurance Manager

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

REFERENCES

Enterolert Test Kit Literature, IDEXX Laboratories Ltd., One IDEXX Drive, Westbrook, ME, 04092 USA

MPN Tables for IDEXX Quanti-Tray 2000 (http://www.idexx.com/water)

APPENDIX A – Test data

NAUTILUS ENVIRONMENTAL

Quanti-Tray Bench Sheet - *Enterococcus*

Client ALS106 Reference 178-0227

Test Initiation

Date: 2017/09/28
Time: 1220
Techician: JM LO

Thermometer Serial #: 160903475
Incubator #: 7
Incubator Temperature: 41 (must be 41 ± 0.5°C)

Sample Information

Reagent used: Enterolert™
Reagent Lot#/Expiry: EN528 V: 18MAY2018
Dilution Factor: —

Comments:

Quanti Tray 2000 Lot#/Expiry: FL104; 6/12/2018

Results - 24 Hour Incubation

Date: 2017/09/29 Time: 1220 Technician: HS

Incubator Temp: _____ (must be 41 ± 0.5°C)	*Enterococci* (Fluorescent)									
	CTL	-01	-02	-03	-04					
# Positive Large Wells:	0	43	18	10	9					
# Ambiguous Large Wells:	0	0	0	0	0					
# Positive Small Wells (Tray 2000 only):	0	16	3	2	1					
# Ambiguous Small Wells (Tray 2000 only):	0	0	0	0	0					
Most Probable Number at 24 hours:	<1	~~143.0~~ 139.1	25.6	13.2	10.9					

Results - 28 Hour Incubation

Date: _____ Time: _____ Technician: LO

Incubator Temp: _____ (must be 41 ± 0.5°C)	**Enterococci** (Fluorescent)									
	CTL									
# Confirmed Positive Large Wells:										
# Confirmed Positive Small Wells (Tray 2000 only):										
Most Probable Number at 28 hours:										

Confirmed positive wells includes the positive wells from 24 hours plus the ambiguous wells that became positive at 28 hours
At 28 hours only score marked ambiguos from 24 hours

APPENDIX B – Chain-of-custody form

L1998834

CALGARY

ALS Environmental

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA
#4, 6125-12 STREET SE
CALGARY,AB T2H 2K1

NOTES: Please reference on final report and invoice: PO# *L1998834*
ALS requires QC data to be provided with your final results.

Please see enclosed 4 **sample(s) in** 4 **Container(s)**

SAMPLE NUMBER 1718-0227	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L1998834-1 WWTP EFFLUENT UV THROUGH		**9/27/2017**	
-01	Enterococcus (ENTERO-HQ 1)	10/10/2017	14°C
L1998834-2 COLUMBIA RIVER UPSTREAM		**9/27/2017**	
-02	Enterococcus (ENTERO-HQ 1)	10/10/2017	14°C
L1998834-3 COLUMBIA RIVER DOWNSTREAM		**9/27/2017**	
-03	Enterococcus (ENTERO-HQ 1)	10/10/2017	14°C
L1998834-4 COLUMBIA RIVER SIDE CHANNEL		**9/27/2017**	
-04	Enterococcus (ENTERO-HQ 1)	10/10/2017	14°C

Subcontract Info Contact: John Forbes (403) 291-9897

Analysis and reporting info contact: Nancy Sonompil
2559 29 STREET NE
CALGARY,AB T1Y 7B5
Phone: (403) 291-9897 Email: Nancy.Sonompil@alsglobal.com

Please email confirmation of receipt to: **Nancy.Sonompil@alsglobal.com**

Shipped By: ______ Date Shipped: Cla 9°C

Received By: ______ Date Received: 2017/09/28 Jason

Verified By: ______ Date Verified: 1150 4x250mL

Temperature: No SIt good condition

Sample Integrity Issues: ______

END OF REPORT

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 987
www.alsglobal.com

L1998834-COFC

Report To		Report Format / Distribution	Analysis Request (subject to availability)
Company:	Kicking Horse Mountain Resort Utility Corporation	☑ Standard ☐ Other	☐ Regular (5-7 Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1: tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2: pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-8442 Fax:	Email 3: mskyring@kickinghorseresort.com	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information	Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #: Week 2 - 2017 Fall EMS program - WW	
Company:	Resorts of the Canadian Rockies	PO / AFE:	
Contact:	Patrick Majer	LSD:	
Address:	1505 - 17th Ave SW Calgary AB		
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact: LS	Sampler: TJ/MS

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-NO2	Total P	Ortho P	Fecal Coliform	Enterococci	E. Coli			Number of Containers
	WWTP Effluent - UV trough Temp: 16 pH: 6.8	SEP 27	1 PM	Water	X	X	X	X	X	X	X	X	X	X			5
	Columbia River Upstream Temp: 12 pH: 7.6	↓	3 PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Down stream Temp: 12 pH: 7.6	↓	↓	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Side Channel Temp: 12 pH: 7.2	↓	↓	Water		X	X	X	X	X	X	X	X	X			4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date: 9/28	Time: 941	Temperature: 9 °C	Verified by:	Date:	Time:	Observations: Yes / No? If Yes add SIF

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 17th AVE SW
CALGARY AB T2T 0E2

Date Received: 05-OCT-17
Report Date: 22-OCT-17 17:33 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2002737

Project P.O. #: NOT SUBMITTED
Job Reference: WEEK 3 - 2017 FALL EMS PROGRAM - WW
C of C Numbers:
Legal Site Desc:

Nancy Sonompil, B. Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2002737-1 WWTP EFFLUENT - UV TROUGH							
Sampled By: TJ/MS on 04-OCT-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.074		0.050	mg/L		22-OCT-17	R3862719
Biochemical Oxygen Demand	<2.0		2.0	mg/L		07-OCT-17	R3853344
Orthophosphate-Dissolved (as P)	1.14	DLHC	0.10	mg/L		05-OCT-17	R3847516
Enterococcus	See Attached					05-OCT-17	R3855476
Coliform Bacteria - Fecal	<1		1	CFU/100mL		05-OCT-17	R3848759
MPN - E. coli	<1		1	MPN/100mL		05-OCT-17	R3848747
Phosphorus (P)-Total	1.42		0.050	mg/L		10-OCT-17	R3851195
Total Suspended Solids	8.7		3.0	mg/L		11-OCT-17	R3854072
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	19.5		0.020	mg/L		07-OCT-17	R3862642
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	19.5		0.050	mg/L		22-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	0.023		0.010	mg/L		07-OCT-17	R3862642
L2002737-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/MS on 04-OCT-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		22-OCT-17	R3862719
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		05-OCT-17	R3847516
Enterococcus	See Attached					05-OCT-17	R3855476
Coliform Bacteria - Fecal	93		1	CFU/100mL		05-OCT-17	R3848759
MPN - E. coli	39	OCR	1	MPN/100mL		05-OCT-17	R3848747
Phosphorus (P)-Total	0.015		0.010	mg/L		10-OCT-17	R3851195
Total Suspended Solids	7.3		3.0	mg/L		11-OCT-17	R3854072
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.078		0.020	mg/L		07-OCT-17	R3862642
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.078		0.050	mg/L		22-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		07-OCT-17	R3862642
L2002737-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 04-OCT-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		22-OCT-17	R3862719
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		05-OCT-17	R3847516
Enterococcus	See Attached					05-OCT-17	R3855476
Coliform Bacteria - Fecal	42		1	CFU/100mL		05-OCT-17	R3848759
MPN - E. coli	19	OCR	1	MPN/100mL		05-OCT-17	R3848747
Phosphorus (P)-Total	0.014		0.010	mg/L		10-OCT-17	R3851195
Total Suspended Solids	9.3		3.0	mg/L		11-OCT-17	R3854072
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.088		0.020	mg/L		07-OCT-17	R3862642
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.088		0.050	mg/L		22-OCT-17	

* 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
L2002737-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 04-OCT-17 @ 15:00							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		07-OCT-17	R3862642
L2002737-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ/MS on 04-OCT-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		22-OCT-17	R3862719
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		05-OCT-17	R3847516
Enterococcus	See Attached					05-OCT-17	R3855476
Coliform Bacteria - Fecal	6		1	CFU/100mL		05-OCT-17	R3848759
MPN - E. coli	2	OCR	1	MPN/100mL		05-OCT-17	R3848747
Phosphorus (P)-Total	0.016		0.010	mg/L		10-OCT-17	R3851195
Total Suspended Solids	5.3		3.0	mg/L		11-OCT-17	R3854072
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.092		0.020	mg/L		07-OCT-17	R3862642
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.092		0.050	mg/L		22-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		07-OCT-17	R3862642

* 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-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.

EC-MPN-CL	Water	MPN - E. coli	APHA 9223B

This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.
Recommended Holding Time:
Sample: 1 day
Reference: APHA

FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D

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

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WP	Water	Phosphorus, Total	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.

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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

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

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 17th AVE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3853344								
WG2637613-3 DUP		**L2002737-1**						
Biochemical Oxygen Demand		<2.0	<2.0	RPD-NA	mg/L	N/A	20	07-OCT-17
WG2637613-2 LCS								
Biochemical Oxygen Demand			98.8		%		85-115	07-OCT-17
WG2637613-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	07-OCT-17
EC-MPN-CL	**Water**							
Batch R3848747								
WG2634164-1 MB								
MPN - E. coli			<1		MPN/100mL		1	05-OCT-17
FCC-MF-CL	**Water**							
Batch R3848759								
WG2634192-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	05-OCT-17
NH3-F-CL	**Water**							
Batch R3862719								
WG2645726-7 DUP		**L2002737-3**						
Ammonia, Total (as N)		<0.050	<0.050	RPD-NA	mg/L	N/A	20	22-OCT-17
WG2645726-6 LCS								
Ammonia, Total (as N)			92.7		%		85-115	22-OCT-17
WG2645726-5 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	22-OCT-17
WG2645726-8 MS		**L2002737-3**						
Ammonia, Total (as N)			94.1		%		75-125	22-OCT-17
NO2-IC-N-CL	**Water**							
Batch R3862642								
WG2645672-11 LCS								
Nitrite (as N)			102.9		%		90-110	07-OCT-17
WG2645672-10 MB								
Nitrite (as N)			<0.010		mg/L		0.01	07-OCT-17
NO3-IC-N-CL	**Water**							
Batch R3862642								
WG2645672-11 LCS								
Nitrate (as N)			101.8		%		90-110	07-OCT-17
WG2645672-10 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-CL	**Water**							
Batch R3862642								
WG2645672-10 MB								
Nitrate (as N)			<0.020		mg/L		0.02	07-OCT-17
P-T-COL-WP	**Water**							
Batch R3851195								
WG2634621-2 LCS								
Phosphorus (P)-Total			99.8		%		80-120	10-OCT-17
WG2634621-1 MB								
Phosphorus (P)-Total			<0.010		mg/L		0.01	10-OCT-17
PO4-DO-COL-CL	**Water**							
Batch R3847516								
WG2632900-7 DUP		**L2002737-1**						
Orthophosphate-Dissolved (as P)		1.14	1.12		mg/L	1.8	20	05-OCT-17
WG2632900-6 LCS								
Orthophosphate-Dissolved (as P)			101.1		%		80-120	05-OCT-17
WG2632900-5 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	05-OCT-17
TSS-CL	**Water**							
Batch R3854072								
WG2637405-5 LCS								
Total Suspended Solids			92.8		%		85-115	11-OCT-17
WG2637405-4 MB								
Total Suspended Solids			<3.0		mg/L		3	11-OCT-17

Quality Control Report

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

Microbial Test Results

Samples collected October 04, 2017

Final Report

October 16, 2017

Submitted to: **ALS Environmental**
Calgary, AB

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

SAMPLE INFORMATION

Sample ID/ Internal ID	Dates			Receipt temperature
	Collected	Received	*Enterococcus* test initiation	
L2002737-1 WWTP EFFLUENT - UV TROUGH/ 1718-0284-01	04-Oct-17 at 1400h	05-Oct-17 at 1230h	05-Oct-17 at 1245h	13.0°C
L2002737-2 COLUMBIA RIVER UPSTREAM/ 1718-0284-02	04-Oct-17 at 1500h	05-Oct-17 at 1230h	05-Oct-17 at 1245h	13.0°C
L2002737-3 COLUMBIA RIVER DOWN STREAM/ 1718-0284-03	04-Oct-17 at 1500h	05-Oct-17 at 1230h	05-Oct-17 at 1245h	13.0°C
L2002737-4 COLUMBIA RIVER SIDE CHANNEL/ 1718-0284-04	04-Oct-17 at 1500h	05-Oct-17 at 1230h	05-Oct-17 at 1245h	13.0°C

TEST TYPES

- *Enterococcus* enumeration test

RESULTS

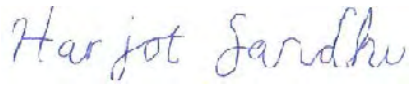
Microbial test results

Sample ID	MPN/100 mL
	Enterococcus
L2002737-1 WWTP EFFLUENT - UV TROUGH	<1.0
L2002737-2 COLUMBIA RIVER UPSTREAM	9.5
L2002737-3 COLUMBIA RIVER DOWN STREAM	2.0
L2002737-4 COLUMBIA RIVER SIDE CHANNEL	<1.0

MPN = Most Probable Number

QA/QC

QA/QC summary	*Enterococcus*
Protocol deviations	None
Control performance	Acceptable
Test performance	Valid



Report By:
Harjot Sandhu, BSc
Biologist

Reviewed By:
Leila Oosterbroek, BSc
Environmental Scientist

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

REFERENCES

Enterolert Test Kit Literature, IDEXX Laboratories Ltd., One IDEXX Drive, Westbrook, ME, 04092 USA

MPN Tables for IDEXX Quanti-Tray 2000 (http://www.idexx.com/water)

APPENDIX A – Test data

NAUTILUS ENVIRONMENTAL

Quanti-Tray Bench Sheet - *Enterococcus*

Client ALS106 Reference 1718-0284

Test Initiation

Date: 2017/10/05
Time: 1245
Techician: JW / HS

Reagent used: Enterolert™
Reagent Lot#/Expiry: AN130 / 2018/03/16

Sample Information
Dilution Factor: -

Comments:

Thermometer Serial #: 160903435
Incubator #: 7
Incubator Temperature: 41 (must be 41 ± 0.5°C)

Quanti Tray 2000 Lot#/Expiry: FL014 / 2018/06/12

Results - 24 Hour Incubation

Date: 2017/10/06 Time: 1245 Technician: HS

Incubator Temp: 41 (must be 41 ± 0.5°C)	***Enterococci*** (Fluorescent)									
	CTL	-01	-02	-03	-04					
# Positive Large Wells:	0	5580	6	2	0					
# Ambiguous Large Wells:	0	0	0	0	6					
# Positive Small Wells (Tray 2000 only)**:**	0	0	3	0	0					
# Ambiguous Small Wells (Tray 2000 only)**:**	0	0	0	0	0					
Most Probable Number at 24 hours:	<1.0	<1.0	~~8.4~~ 4.5	2.0	<1.0					

Results - 28 Hour Incubation

Date: _____ Time: _____ Technician: _____

Incubator Temp: _____ (must be 41 ± 0.5°C)	**Enterococci** (Fluorescent)									
	CTL									
# Confirmed Positive Large Wells:										
# Confirmed Positive Small Wells (Tray 2000 only)**:**										
Most Probable Number at 28 hours:										

Confirmed positive wells includes the positive wells from 24 hours plus the ambiguous wells that became positive at 28 hours
At 28 hours only score marked ambiguos from 24 hours

HS

APPENDIX B – Chain-of-custody form

ALS Environmental

L2002737

CALGARY

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA
#4, 6125-12 STREET SE
CALGARY,AB T2H 2K1

NOTES: Please reference on final report and invoice: PO# *L2002737*
ALS requires QC data to be provided with your final results.

Please see enclosed 4 sample(s) in 4 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L2002737-1 WWTP EFFLUENT - UV TROUGH		**10/4/2017** 2pm	
	Enterococcus (ENTERO-HQ 1)	10/17/2017	
L2002737-2 COLUMBIA RIVER UPSTREAM		**10/4/2017** 3pm	
	Enterococcus (ENTERO-HQ 1)	10/17/2017	
L2002737-3 COLUMBIA RIVER DOWN STREAM		**10/4/2017** 3pm	
	Enterococcus (ENTERO-HQ 1)	10/17/2017	
L2002737-4 COLUMBIA RIVER SIDE CHANNEL		**10/4/2017** 3pm	
	Enterococcus (ENTERO-HQ 1)	10/17/2017	

Subcontract Info Contact: John Forbes (403) 291-9897
Analysis and reporting info contact: Nancy Sonompil
2559 29 STREET NE
CALGARY,AB T1Y 7B5
Phone: (403) 291-9897 Email: Nancy.Sonompil@alsglobal.com

Please email confirmation of receipt to: **Nancy.Sonompil@alsglobal.com**

Shipped By: _____ Date Shipped: Ca. No SII

Received By: _____ Date Received: 2017/10/05 4 x 250mL

Verified By: _____ Date Verified: 1230 Jaz00

Temperature: 13°C

Sample Integrity Issues: _____

END OF REPORT

ALS Environmental

L2002737-COFC

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC #

Page 1 of 1

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Kicking Horse Mountain Resort Utility Corporation	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% surcharge - Contact ALS to Confirm TAT
		Email 2.	pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-8442 Fax:	Email 3:	mskyring@kickinghorseresort.com	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	Week - 2017 Fall EMS program - WW	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact:	LS	Sampler: TJ/MS

Sample # (lab use only)	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-NO2	Total P	Ortho P	Fecal Coliform	Enterococci	E. Coli			Number of Containers
	WWTP Effluent - UV trough Temp: 14 pH: 6.6	OCT 4	2PM	Water	X	X	X	X	X	X	X	X	X	X			5
	Columbia River Upstream Temp: 10 pH: 7.8	OCT 4	3PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Down stream Temp: 10 pH: 8.0	OCT 4	3PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Side Channel Temp: 10 pH: 8.0	OCT 4	3PM	Water		X	X	X	X	X	X	X	X	X			4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh mm)	Received by: MM	Date: 5 Oct 17	Time: 9:10	Temperature: 3 °C	Verified by:	Date:	Time:	Observations: Yes / No? If Yes add SIF

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 11-OCT-17
Report Date: 24-OCT-17 16:30 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2004966

Project P.O. #: NOT SUBMITTED
Job Reference: WEEK 4 - 2017 FALL EMS PROGRAM - WW
C of C Numbers:
Legal Site Desc:

Nancy Sonompil, B. Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2004966-1 WWTP EFFLUENT - UV TROUGH							
Sampled By: TJ/MS on 10-OCT-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.066		0.050	mg/L		23-OCT-17	R3864236
Biochemical Oxygen Demand	2.6		2.0	mg/L		11-OCT-17	R3856969
Orthophosphate-Dissolved (as P)	0.818	DLHC	0.050	mg/L		11-OCT-17	R3852708
Enterococcus	See Attached					12-OCT-17	R3859988
Coliform Bacteria - Fecal	1		1	CFU/100mL		11-OCT-17	R3853236
MPN - E. coli	<1		1	MPN/100mL		11-OCT-17	R3853209
Phosphorus (P)-Total	1.10		0.010	mg/L		13-OCT-17	R3853635
Total Suspended Solids	4.3		3.0	mg/L		17-OCT-17	R3860081
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	23.7		0.020	mg/L		11-OCT-17	R3864287
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	23.8		0.050	mg/L		24-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	0.041		0.010	mg/L		11-OCT-17	R3864287
L2004966-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/MS on 10-OCT-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		23-OCT-17	R3864236
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		11-OCT-17	R3852708
Enterococcus	See Attached					12-OCT-17	R3859988
Coliform Bacteria - Fecal	52		1	CFU/100mL		11-OCT-17	R3853236
MPN - E. coli	12	OCR	1	MPN/100mL		11-OCT-17	R3853209
Phosphorus (P)-Total	0.015		0.010	mg/L		13-OCT-17	R3853635
Total Suspended Solids	7.7		3.0	mg/L		17-OCT-17	R3860081
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.084		0.020	mg/L		11-OCT-17	R3864287
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.084		0.050	mg/L		24-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-OCT-17	R3864287
L2004966-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 10-OCT-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		23-OCT-17	R3864236
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		11-OCT-17	R3852708
Enterococcus	See Attached					12-OCT-17	R3859988
Coliform Bacteria - Fecal	53		1	CFU/100mL		11-OCT-17	R3853236
MPN - E. coli	19	OCR	1	MPN/100mL		11-OCT-17	R3853209
Phosphorus (P)-Total	0.013		0.010	mg/L		13-OCT-17	R3853635
Total Suspended Solids	4.3		3.0	mg/L		17-OCT-17	R3860081
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.093		0.020	mg/L		11-OCT-17	R3864287
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.093		0.050	mg/L		24-OCT-17	

* 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
L2004966-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 10-OCT-17 @ 15:00							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-OCT-17	R3864287
L2004966-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ/MS on 10-OCT-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		23-OCT-17	R3863475
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		11-OCT-17	R3852708
Enterococcus	See Attached					12-OCT-17	R3859988
Coliform Bacteria - Fecal	7		1	CFU/100mL		11-OCT-17	R3853236
MPN - E. coli	6	OCR	1	MPN/100mL		11-OCT-17	R3853209
Phosphorus (P)-Total	0.017		0.010	mg/L		13-OCT-17	R3853635
Total Suspended Solids	4.3		3.0	mg/L		17-OCT-17	R3860081
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.178		0.020	mg/L		11-OCT-17	R3864287
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.178		0.050	mg/L		24-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		11-OCT-17	R3864287

* 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.
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.

EC-MPN-CL	Water	MPN - E. coli	APHA 9223B

This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.
Recommended Holding Time:
Sample: 1 day
Reference: APHA

FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D

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

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WP	Water	Phosphorus, Total	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.

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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

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

Quality Control Report

Workorder: L2004966 Report Date: 24-OCT-17

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3856969								
WG2640689-5 LCS								
Biochemical Oxygen Demand			100.7		%		85-115	11-OCT-17
WG2640689-4 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	11-OCT-17
EC-MPN-CL	**Water**							
Batch R3853209								
WG2637990-1 MB								
MPN - E. coli			<1		MPN/100mL		1	11-OCT-17
FCC-MF-CL	**Water**							
Batch R3853236								
WG2638056-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	11-OCT-17
NH3-F-CL	**Water**							
Batch R3863475								
WG2646559-2 LCS								
Ammonia, Total (as N)			110.6		%		85-115	23-OCT-17
WG2646559-1 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	23-OCT-17
Batch R3864236								
WG2647022-3 DUP		**L2004966-1**						
Ammonia, Total (as N)		0.066	0.065		mg/L	0.6	20	23-OCT-17
WG2647022-2 LCS								
Ammonia, Total (as N)			100.0		%		85-115	23-OCT-17
WG2647022-1 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	23-OCT-17
WG2647022-4 MS		**L2004966-1**						
Ammonia, Total (as N)			103.4		%		75-125	23-OCT-17
NO2-IC-N-CL	**Water**							
Batch R3864287								
WG2647054-11 DUP		**L2004966-2**						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	11-OCT-17
WG2647054-10 LCS								
Nitrite (as N)			103.0		%		90-110	11-OCT-17
WG2647054-9 MB								
Nitrite (as N)			<0.010		mg/L		0.01	11-OCT-17
WG2647054-12 MS		**L2004966-2**						

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-CL	**Water**							
Batch R3864287								
WG2647054-12 MS		**L2004966-2**						
Nitrite (as N)			112.5		%		75-125	11-OCT-17
NO3-IC-N-CL	**Water**							
Batch R3864287								
WG2647054-11 DUP		**L2004966-2**						
Nitrate (as N)		0.084	0.081		mg/L	4.4	20	11-OCT-17
WG2647054-10 LCS								
Nitrate (as N)			101.6		%		90-110	11-OCT-17
WG2647054-9 MB								
Nitrate (as N)			<0.020		mg/L		0.02	11-OCT-17
WG2647054-12 MS		**L2004966-2**						
Nitrate (as N)			110.2		%		75-125	11-OCT-17
P-T-COL-WP	**Water**							
Batch R3853635								
WG2637897-10 LCS								
Phosphorus (P)-Total			99.6		%		80-120	13-OCT-17
WG2637897-9 MB								
Phosphorus (P)-Total			<0.010		mg/L		0.01	13-OCT-17
PO4-DO-COL-CL	**Water**							
Batch R3852708								
WG2637111-2 LCS								
Orthophosphate-Dissolved (as P)			95.0		%		80-120	11-OCT-17
WG2637111-1 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	11-OCT-17
TSS-CL	**Water**							
Batch R3860081								
WG2641870-6 DUP		**L2004966-1**						
Total Suspended Solids		4.3	5.0		mg/L	14	20	17-OCT-17
WG2641870-5 LCS								
Total Suspended Solids			97.6		%		85-115	17-OCT-17
WG2641870-4 MB								
Total Suspended Solids			<3.0		mg/L		3	17-OCT-17

Quality Control Report

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

Microbial Test Results

Samples collected October 10, 2017

Final Report

October 19, 2017

Submitted to: **ALS Environmental**
Calgary, AB

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

SAMPLE INFORMATION

Sample ID/ Internal ID	Dates			Receipt temperature
	Collected	Received	*Enterococcus* test initiation	
L2004966-1 WWTP EFFLUENT - UV TROUGH/ 1718-0311-01	10-Oct-17 at 1400h	11-Oct-17 at 1100h	11-Oct-17 at 1300h	7.9°C
L2004966-2 COLUMBIA RIVER UPSTREAM/ 1718-0311-02	10-Oct-17 at 1500h	11-Oct-17 at 1100h	11-Oct-17 at 1300h	7.1°C
L2004966-3 COLUMBIA RIVER DOWN STREAM/ 1718-0311-03	10-Oct-17 at 1500h	11-Oct-17 at 1100h	11-Oct-17 at 1300h	6.9°C
L2004966-4 COLUMBIA RIVER SIDE CHANNEL/ 1718-0311-04	10-Oct-17 at 1500h	11-Oct-17 at 1100h	11-Oct-17 at 1300h	7.9°C

TEST TYPES

- *Enterococcus* enumeration test

RESULTS

Microbial test results

Sample ID	MPN/100 mL
	Enterococcus
L2004966-1 WWTP EFFLUENT - UV TROUGH	<1.0
L2004966-2 COLUMBIA RIVER UPSTREAM	41.4
L2004966-3 COLUMBIA RIVER DOWN STREAM	24.1
L2004966-4 COLUMBIA RIVER SIDE CHANNEL	4.1

MPN = Most Probable Number

QA/QC

QA/QC summary	*Enterococcus*
Protocol deviations	None
Control performance	Acceptable
Test performance	Valid

Report By:
Harjot Sandhu, BSc
Biologist

Reviewed By:
Tamara McClure, BSc
Quality Assurance Manager

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

REFERENCES

Cochrane, W.G. 1950. Estimation of Bacterial Densities by Means of the "Most Probable Number". Biometrics 5: 105-116.

Enterolert Test Kit Literature, IDEXX Laboratories Ltd., One IDEXX Drive, Westbrook, ME, 04092 USA

MPN Tables for IDEXX Quanti-Tray 2000 (http://www.idexx.com/water)

APPENDIX A – Test data

NAUTILUS ENVIRONMENTAL

Quanti-Tray Bench Sheet - *Enterococcus*

Client 405106 Reference 1718-0311

Test Initiation

Date: 2017/10/11
Time: 1115
Techician: 1300

Thermometer Serial #: 160903475
Incubator #: 7
Incubator Temperature: 41 (must be 41 ± 0.5°C)

Reagent used: Enterolert™
Reagent Lot#/Expiry: ENS28J 2018/05/18

Quanti Tray 2000 Lot#/Expiry: F2014 / 2018/06/12

Sample Information
Dilution Factor: -

Comments:

Results - 24 Hour Incubation

Date: 2017/10/12 Time: 1300 Technician: HS

Incubator Temp: 41 (must be 41 ± 0.5°C)	***Enterococci*** (Fluorescent)									
	CTL	-01	-02	-03	-04					
# Positive Large Wells:	0	0	26	17	3					
# Ambiguous Large Wells:	0	0	0	0	0					
# Positive Small Wells (Tray 2000 only)**:**	0	0	4	3	1					
# Ambiguous Small Wells (Tray 2000 only)**:**	0	0	0	0	0					
Most Probable Number at 24 hours:	<1.0	<1.0	41.4	24.1	4.1					

Results - 28 Hour Incubation

Date: _____ Time: _____ Technician: _____

Incubator Temp: _____ (must be 41 ± 0.5°C)	**Enterococci** (Fluorescent)									
	CTL									
# Confirmed Positive Large Wells:										
# Confirmed Positive Small Wells (Tray 2000 only)**:**										
Most Probable Number at 28 hours:										

Confirmed positive wells includes the positive wells from 24 hours plus the ambiguous wells that became positive at 28 hours
At 28 hours only score marked ambiguos from 24 hours

HS

APPENDIX B – Chain-of-custody form

L2004966

CALGARY

ALS Environmental

Subcontract Request Form

2017/10/11 AP
1100 drappoff
N I/S goodcon.

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA
#4, 6125-12 STREET SE
CALGARY,AB T2H 2K1

NOTES: Please reference on final report and invoice: PO# *L2004966*
ALS requires QC data to be provided with your final results.

Please see enclosed 4 sample(s) in 4 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L2004966-1 WWTP EFFLUENT - UV TROUGH (1718-0311-01)		**10/10/2017**	7.9C
	Enterococcus (ENTERO-HQ 1)	10/23/2017 @ 2pm	
L2004966-2 COLUMBIA RIVER UPSTREAM (1718-0311-02)		**10/10/2017**	7.1C
	Enterococcus (ENTERO-HQ 1)	10/23/2017 @ 3pm	
L2004966-3 COLUMBIA RIVER DOWN STREAM (1718-0311-03)		**10/10/2017**	6.9C
	Enterococcus (ENTERO-HQ 1)	10/23/2017 @ 3pm	
L2004966-4 COLUMBIA RIVER SIDE CHANNEL (1718-0311-04)		**10/10/2017**	7.9C
	Enterococcus (ENTERO-HQ 1)	10/23/2017 @ 3pm	

Subcontract Info Contact: John Forbes (403) 291-9897
Analysis and reporting info contact: Nancy Sonompil
2559 29 STREET NE
CALGARY,AB T1Y 7B5
Phone: (403) 291-9897 Email: Nancy.Sonompil@alsglobal.com

Please email confirmation of receipt to: Nancy.Sonompil@alsglobal.com

Shipped By: _____ Date Shipped: _____

Received By: _____ Date Received: _____

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

END OF REPORT

ALS Environmental

Chain of Custody / Analytical Re
Canada Toll Free: 1 800 668
www.alsglobal.com

L2004966-COFC

COC #

Page 1 of 1

Report To		Report Format / Distribution		Turnaround Time (analysis subject to availability)
Company:	Kicking Horse Mountain Resort Utility Corporation	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1: tjobin@kickinghorseresort.com		○ Emergency (1-2 Bus. Days) 100% Surcharge - Contact ALS to Confirm TAT
		Email 2: pmajer@skircr.com		○ Same Day or Weekend emergency - Contact ALS to Confirm TAT
Phone:	250-344-8442 Fax:	Email 3: mskyring@kickinghorseresort.com		Analysis Request
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #: Week 4 - 2017 Fall EMS program - WW		
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact: LS	Sampler: TJ/MS	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-NO2	Total P	Ortho P	Fecal Coliform	Enterococci	E. Coli			Number of Containers
	WWTP Effluent - UV trough Temp: 13 pH: 6.8	OCT 10	2PM	Water	X	X	X	X	X	X	X	X	X	X			5
	Columbia River Upstream Temp: 7 pH: 7.8	"	3PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Down stream Temp: 7 pH: 7.8	"	3PM	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Side Channel Temp: 7 pH: 7.8	"	3PM	Water		X	X	X	X	X	X	X	X	X			4

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No? If Yes add SIF
			MM	11-Oct-17	9:15	5 °C				

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 19-OCT-17
Report Date: 30-OCT-17 17:52 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2009703

Project P.O. #: NOT SUBMITTED
Job Reference: WEEK 5 - 2017 FALL EMS PROGRAM - WW
C of C Numbers:
Legal Site Desc:

Nancy Sonompil, B. Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2009703-1 WWTP EFFLUENT - UV TROUGH							
Sampled By: TJ/MS on 18-OCT-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.114		0.050	mg/L		28-OCT-17	R3868710
Biochemical Oxygen Demand	<2.0		2.0	mg/L		20-OCT-17	R3866164
Orthophosphate-Dissolved (as P)	0.742	DLHC	0.050	mg/L		19-OCT-17	R3860459
Enterococcus	See Attached					20-OCT-17	R3869124
Coliform Bacteria - Fecal	1		1	CFU/100mL		19-OCT-17	R3861368
MPN - E. coli	1	OCR	1	MPN/100mL		19-OCT-17	R3861294
Phosphorus (P)-Total	0.972		0.020	mg/L	23-OCT-17	25-OCT-17	R3865974
Total Suspended Solids	24.3		3.0	mg/L		24-OCT-17	R3866054
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	19.0		0.020	mg/L		19-OCT-17	R3860489
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	19.1		0.050	mg/L		20-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	0.035		0.010	mg/L		19-OCT-17	R3860489
L2009703-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/MS on 18-OCT-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		28-OCT-17	R3868710
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		19-OCT-17	R3860459
Enterococcus	See Attached					20-OCT-17	R3869124
Coliform Bacteria - Fecal	10		1	CFU/100mL		19-OCT-17	R3861368
MPN - E. coli	8	OCR	1	MPN/100mL		19-OCT-17	R3861294
Phosphorus (P)-Total	<0.020		0.020	mg/L	23-OCT-17	25-OCT-17	R3865974
Total Suspended Solids	19.0		3.0	mg/L		24-OCT-17	R3866054
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.092		0.020	mg/L		19-OCT-17	R3860489
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.092		0.050	mg/L		20-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		19-OCT-17	R3860489
L2009703-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 18-OCT-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		28-OCT-17	R3868710
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		19-OCT-17	R3860459
Enterococcus	See Attached					20-OCT-17	R3869124
Coliform Bacteria - Fecal	11		1	CFU/100mL		19-OCT-17	R3861368
MPN - E. coli	5	OCR	1	MPN/100mL		19-OCT-17	R3861294
Phosphorus (P)-Total	0.027		0.020	mg/L	23-OCT-17	25-OCT-17	R3865974
Total Suspended Solids	34.3		3.0	mg/L		24-OCT-17	R3866054
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.102		0.020	mg/L		19-OCT-17	R3860489
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.102		0.050	mg/L		20-OCT-17	

* 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
L2009703-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 18-OCT-17 @ 15:00							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		19-OCT-17	R3860489
L2009703-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ/MS on 18-OCT-17 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		28-OCT-17	R3868710
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		19-OCT-17	R3860459
Enterococcus	See Attached					20-OCT-17	R3869124
Coliform Bacteria - Fecal	6		1	CFU/100mL		19-OCT-17	R3861368
MPN - E. coli	5	OCR	1	MPN/100mL		19-OCT-17	R3861294
Phosphorus (P)-Total	0.020		0.020	mg/L	23-OCT-17	25-OCT-17	R3865974
Total Suspended Solids	21.0		3.0	mg/L		24-OCT-17	R3866054
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.111		0.020	mg/L		19-OCT-17	R3860489
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.111		0.050	mg/L		20-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		19-OCT-17	R3860489

* 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.
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.

EC-MPN-CL	Water	MPN - E. coli	APHA 9223B

This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.
Recommended Holding Time:
Sample: 1 day
Reference: APHA

FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D

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

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-ED	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.

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

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

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3866164								
WG2648612-2 LCS								
Biochemical Oxygen Demand			100.8		%		85-115	20-OCT-17
WG2648612-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	20-OCT-17
EC-MPN-CL	**Water**							
Batch R3861294								
WG2644919-4 MB								
MPN - E. coli			<1		MPN/100mL		1	19-OCT-17
FCC-MF-CL	**Water**							
Batch R3861368								
WG2644939-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	19-OCT-17
WG2644939-3 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	19-OCT-17
NH3-F-CL	**Water**							
Batch R3868710								
WG2651372-20 DUP		**L2009703-1**						
Ammonia, Total (as N)		0.114	0.112		mg/L	1.1	20	28-OCT-17
WG2651372-14 LCS								
Ammonia, Total (as N)			109.9		%		85-115	28-OCT-17
WG2651372-18 LCS								
Ammonia, Total (as N)			101.4		%		85-115	28-OCT-17
WG2651372-13 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	28-OCT-17
WG2651372-17 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	28-OCT-17
WG2651372-19 MS		**L2009703-1**						
Ammonia, Total (as N)			N/A	MS-B	%		-	28-OCT-17
NO2-IC-N-CL	**Water**							
Batch R3860489								
WG2644650-7 DUP		**L2009703-4**						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	19-OCT-17
WG2644650-6 LCS								
Nitrite (as N)			105.2		%		90-110	19-OCT-17
WG2644650-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	19-OCT-17
WG2644650-8 MS		**L2009703-4**						

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-CL	**Water**							
Batch R3860489								
WG2644650-8 MS		**L2009703-4**						
Nitrite (as N)			113.8		%		75-125	19-OCT-17
NO3-IC-N-CL	**Water**							
Batch R3860489								
WG2644650-7 DUP		**L2009703-4**						
Nitrate (as N)		0.111	0.109		mg/L	1.5	20	19-OCT-17
WG2644650-6 LCS								
Nitrate (as N)			103.2		%		90-110	19-OCT-17
WG2644650-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	19-OCT-17
WG2644650-8 MS		**L2009703-4**						
Nitrate (as N)			113.1		%		75-125	19-OCT-17
P-T-COL-ED	**Water**							
Batch R3865974								
WG2646642-11 LCS		**KONELAB_TP**						
Phosphorus (P)-Total			93.5		%		80-120	25-OCT-17
WG2646642-2 LCS		**KONELAB_TP**						
Phosphorus (P)-Total			95.4		%		80-120	25-OCT-17
WG2646642-9 LCS		**KONELAB_TP**						
Phosphorus (P)-Total			95.2		%		80-120	25-OCT-17
WG2646642-1 MB								
Phosphorus (P)-Total			<0.020		mg/L		0.02	25-OCT-17
WG2646642-10 MB								
Phosphorus (P)-Total			<0.020		mg/L		0.02	25-OCT-17
WG2646642-12 MB								
Phosphorus (P)-Total			<0.020		mg/L		0.02	25-OCT-17
PO4-DO-COL-CL	**Water**							
Batch R3860459								
WG2643876-7 LCS								
Orthophosphate-Dissolved (as P)			100.1		%		80-120	19-OCT-17
WG2643876-3 MB								
Orthophosphate-Dissolved (as P)			<0.0050		mg/L		0.005	19-OCT-17
TSS-CL	**Water**							
Batch R3866054								
WG2647682-2 LCS								
Total Suspended Solids			97.6		%		85-115	24-OCT-17
WG2647682-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TSS-CL	**Water**							
Batch R3866054								
WG2647682-1 MB								
Total Suspended Solids			<3.0		mg/L		3	24-OCT-17

Quality Control Report

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

Microbial Test Results

Samples collected October 18, 2017

Final Report

October 29, 2017

Submitted to: **ALS Environmental**
Calgary, AB

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

SAMPLE INFORMATION

Sample ID/ Internal ID	Dates			Receipt temperature
	Collected	Received	*Enterococcus* test initiation	
L2009703-1 WWTP EFFLUENT – UV TROUGH / 1718-0349-01	18-Oct-17 at 1400h	19-Oct-17 at 1120h	19-Oct-17 at 1135h	12°C
L2009703-2 COLUMBIA RIVER UPSTREAM / 1718-0349-02	18-Oct-17 at 1500h	19-Oct-17 at 1120h	19-Oct-17 at 1135h	12°C
L2009703-3 COLUMBIA RIVER DOWN STREAM / 1718-0349-03	18-Oct-17 at 1500h	19-Oct-17 at 1120h	19-Oct-17 at 1135h	12°C
L2009703-4 COLUMBIA RIVER SIDE CHANNEL / 1718-0349-04	18-Oct-17 at 1500h	19-Oct-17 at 1120h	19-Oct-17 at 1135h	12°C

TEST TYPES

- *Enterococcus* enumeration test

RESULTS

Microbial test results

Sample ID	MPN/100 mL
	Enterococcus
L2009703-1 WWTP EFFLUENT – UV TROUGH	9.5
L2009703-2 COLUMBIA RIVER UPSTREAM	13.2
L2009703-3 COLUMBIA RIVER DOWN STREAM	13.5
L2009703-4 COLUMBIA RIVER SIDE CHANNEL	26.2

MPN = Most Probable Number

QA/QC

QA/QC summary	*Enterococcus*
Protocol deviations	None
Control performance	Acceptable
Test performance	Valid

Report By:
Tamara McClure, BSc
Quality Assurance Manager

Reviewed By:
Leila Oosterbroek, BSc
Environmental Scientist

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

REFERENCES

Enterolert Test Kit Literature, IDEXX Laboratories Ltd., One IDEXX Drive, Westbrook, ME, 04092 USA

MPN Tables for IDEXX Quanti-Tray 2000 (http://www.idexx.com/water)

APPENDIX A – Test data

NAUTILUS ENVIRONMENTAL

Quanti-Tray Bench Sheet - *Enterococcus*

Client ALS106 Reference 1718-0349

Test Initiation

Date: 2017/10/19
Time: 1135
Techician: LO/TM

Thermometer Serial #: 160903475
Incubator #: 7
Incubator Temperature: 41 (must be 41 ± 0.5°C)

Sample Information

Reagent used: Enterolert™
Reagent Lot#/Expiry: EN528 18 May 2018
Dilution Factor: —

Comments:

Quanti Tray 2000 Lot#/Expiry: 07/10/2020; lot: 6N047

Results - 24 Hour Incubation

Date: 2017/10/20 Time: 1130 Technician: TM

Incubator Temp: 41 (must be 41 ± 0.5°C)	*Enterococci* (Fluorescent)									
	CTL	-01	-02	-03	-04					
# Positive Large Wells:	0	4	10	11	15					
# Ambiguous Large Wells:	0	2	0	1	5					
# Positive Small Wells (Tray 2000 only):	0	3	2	0	1					
# Ambiguous Small Wells (Tray 2000 only):	0	3	0	0	0					
Most Probable Number at 24 hours:	<1	—	—	—	—					

Results - 28 Hour Incubation

Date: 2017/10/20 Time: 1530 Technician: TM

Incubator Temp: 41 (must be 41 ± 0.5°C)	**Enterococci** (Fluorescent)									
	CTL									
# Confirmed Positive Large Wells:	0	6	10	12	20					
# Confirmed Positive Small Wells (Tray 2000 only):	0	3	2	0	1					
Most Probable Number at 28 hours:	<1	9.5	13.2	13.5	~~24~~ 26.2					

Confirmed positive wells includes the positive wells from 24 hours plus the ambiguous wells that became positive at 28 hours
At 28 hours only score marked ambiguos from 24 hours

APPENDIX B – Chain-of-custody form

ALS Environmental

L2009703

CALGARY

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA
#4, 6125-12 STREET SE
CALGARY,AB T2H 2K1

NOTES: Please reference on final report and invoice: PO# *L2009703*
ALS requires QC data to be provided with your final results.

Please see enclosed 4 **sample(s) in** 4 **Container(s)**

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
718-0341-01 **L2009703-1 WWTP EFFLUENT - UV TROUGH**		10/ 18/ 2017 14:00	
	Enterococcus (ENTERO-HQ 1)	10/26/2017	
-02 **L2009703-2 COLUMBIA RIVER UPSTREAM**		10/ 18/ 2017 15:00	
	Enterococcus (ENTERO-HQ 1)	10/26/2017	
-03 **L2009703-3 COLUMBIA RIVER DOWN STREAM**		10/ 18/ 2017 15:00	
	Enterococcus (ENTERO-HQ 1)	10/26/2017	
-04 **L2009703-4 COLUMBIA RIVER SIDE CHANNEL**		10/ 18/ 2017 15:00	
	Enterococcus (ENTERO-HQ 1)	10/26/2017	

Subcontract Info Contact: John Forbes (403) 291-9897
Analysis and reporting info contact: Nancy Sonompil, B. Sc.
2559 29 STREET NE
CALGARY,AB T1Y 7B5
Phone: (403) 291-9897 Email: Nancy.Sonompil@alsglobal.com

Please email confirmation of receipt to: **Nancy.Sonompil@alsglobal.com**

Shipped By: _____ Date Shipped: _____

Received By: _____ Date Received: _____

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

rec'd 2017/10/19 1120 BS
Jazoo 4/x 250 mL good condn
no S/I 12°C

Thursday, October 19, 2017 10:07 AM

END OF REPORT

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

L2009703-COFC

f 1

Report To	
Company:	Kicking Horse Mountain Resort Utility Corporation
Contact:	Travis Jobin
Address	1500 Kicking Horse Trail
Phone:	250-344-6442 Fax:
Invoice To	Same as Report ? ☐ Yes ☑ No
Hardcopy of Invoice with Report?	☐ Yes ☑ No
Company:	Resorts of the Canadian Rockies
Contact:	Patrick Majer
Address:	1505 - 17th Ave SW Calgary AB
Phone	Fax:
Lab Work Order # (lab use only)	

Report Format / Distribution	
☑ Standard	☐ Other
☐ PDF ☐ Excel ☐ Digital	☑ Fax
Email 1:	tjobin@kickinghorseresort.com
Email 2:	pmajer@skircr.com
Email 3:	mskyring@kickinghorseresort.com
Client / Project Information	
Job #:	Week 5 - 2017 Fall EMS program - WW
PO / AFE:	
LSD:	
Quote #:	
ALS Contact: LS	Sampler: TJ/MS

Servic... ...lity)

- ◉ Regular (Standard Turnaround Times - Business Days)
- ◯ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
- ◯ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
- ◯ Same Day or Weekend Emergency - Contact ALS to Confirm TAT

Analysis Request

Please indicate below Filtered, Preserved or both (F, P, F/P)

Sample # (lab use only)	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-NO2	Total P	Ortho P	Fecal Coliform	Enterococci	E. Coli			Number of Containers
	WWTP Effluent - UV trough Temp: 11.4 pH: ~~8.2~~ 6.8	18-oct-17	14:00	Water	X	X	X	X	X	X	X	X	X	X			5
	Columbia River Upstream Temp: 6.4 pH: 8.2	18-oct-17	15:00	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Down stream Temp: 6.4 pH: 8.2	18-oct-17	15:00	Water		X	X	X	X	X	X	X	X	X			4
	Columbia River Side Channel Temp: 6.4 pH: 9.2	18-oct-17	15:00	Water		X	X	X	X	X	X	X	X	X			4
		* Collected from bottles - mm 19-oct-17															

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by: Br	Date: 10/19	Time: 9:20	Temperature: 7 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

GENF 20.00 Front

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 22-NOV-17
Report Date: 30-NOV-17 14:56 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2025715

Project P.O. #: NOT SUBMITTED
Job Reference: RCR - KICKING HORSE MOUNTAIN RESORT
C of C Numbers:
Legal Site Desc:

Nancy Sonompil, B. Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2025715-1 UV TROUGH Sampled By: TJ on 21-NOV-17 @ 13:00 Matrix: WATER							
Miscellaneous Parameters							
Trout Bioassay - Pass/Fail	See attached.					23-NOV-17	R3898867

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
TROUT-P/F-WP	Water	Trout Bioassay Pass/Fail	EPS 1/RM/13, EPS 1/RM/9

Certified, disease-free rainbow trout (Oncorhynchus mykiss) are exposed to the full-strength (100%) sample, under static conditions in order to obtain a pass/fail indication of toxicity. A sample is considered to "fail" if >50% mortality is observed within a 96-hour exposure period.

Samples with excessive salinity (reported as conductivity greater than 13700 µmhos/cm) discharging into marine waters will require alternate testing.

** 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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

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

Quality Control Report

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed

Quality Control Report

Legend:

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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

Rainbow Trout Bioassay Test Report - Pass/Fail

Sample ID:	L2025715-1

Summary Results

96-hour Pass/Fail:	PASS

Sample Information

Sample Origin:	Kicking Horse Mountain Water Utility Co. Ltd
Sample Description:	UV Trough
Sampling Date and Time:	21-Nov-17 13:00
Sampling Method:	Grab
Sampled By:	TJ
Container(s) Description:	2 x 20L cubic bag
Sample Volume:	40L
Date and Time Received:	23-Nov-17 10:00
Transit Irregularities:	None
Storage Temperature (°C):	N/A

Test Information

Test Organism:	Oncorhynchus mykiss
Test Description:	Acute, 96-hour, Static, Pass/Fail
Reference Method(s):	EPS 1/RM/13, 2nd Ed. Dec. 2000, with 2007 and 2016 amendments, Environment Canada EPS 1/RM/9, May 1996 with May 2007 amendments, Environment Canada
Performed By:	AGJ
Starting Date and Time:	23-Nov-17 14:45
Deviations from Reference Method:	None

Initial Parameters

Observations

Colour:	Light Yellow					
Odour:	Mild					
Turbidity:	Low					
Solids:	Low					
Hardness (mg/L):	1.9	mL Titration Solution/	10	mL of Sample x 1000 =	190	
Alkalinity (mg/L):	1.5	mL Titration Solution/	10	mL of Sample x 1000 =	150	
Temperature (°C):	14	Thermometer		S/N 91154465		
Dissolved Oxygen (mg/L):	9.84	YSI Dissolved Oxygen Meter		S/N 15M102668		
Conductivity (µS/cm):	602	VWR Portable Conductivity Meter		S/N 51071543		
pH (5.5-8.5 pH units):	7.44	VWR SympHony pH Meter		S/N D01908		
pH Adjustment:	Not Adjusted					
pH Adjustment Procedure:	n/a					

Pre-Aeration

Aeration Time (min):	30	
Sample Test Concentration (v/v):	100%	0%
Aeration Rate (5.5-7.5 mL/min/L):	6.3 ± 0.1	6.3 ± 0.1
Dissolved Oxygen (D.O.) Before Pre-Aeration (%):	89.1	97.3
Average D.O. After Pre-Aeration (%):	89.5	97.4

Test Organism Data

Lot Number:	24/10/17 T5
Weekly Mortality Preceeding Test (%):	0.95
Sample Size:	10

Conditions Common to All Concentrations During Test

Source of Holding/Dilution Water:	Dechlorinated UV Treated City of Winnipeg Tap Water
Container Description:	20 L Polyethylene Pail with Liner
Aeration Method:	Compressed air bubbled through silica-glass air diffuser
Aeration Rate (5.5-7.5 mL/min/L):	(as set during pre-aeration above)
Test Solution Volume (L):	40
Test Solution Depth (cm):	46.5
Number of Test Organisms per Container:	10
Loading Density (g/L):	0.29

Conditions During Test

Concentration (% v/v)	Temperature (°C) (15 ± 1°C)					Dissolved Oxygen (mg/L)					pH (pH units)				
	0h	24h	48h	72h	96h	0h	24h	48h	72h	96h	0h	24h	48h	72h	96h
0	14	n/a	n/a	n/a	14	9.82	n/a	n/a	n/a	9.76	7.27	n/a	n/a	n/a	7.59
100	14	n/a	n/a	n/a	14	10.16	n/a	n/a	n/a	9.70	7.45	n/a	n/a	n/a	7.89

Conc. (% v/v)	Conductivity (µS/cm)	Number of Fish Dead				Number of Fish Stressed			
	0h	24h	48h	72h	96h	24h	48h	72h	96h
0	303	n/a	n/a	n/a	0	n/a	n/a	n/a	0
100	598	n/a	n/a	n/a	0	n/a	n/a	n/a	0

Control Fish Information at End of Test

Mean Fork Length (mm):	51
Lower Range Fork Length (mm):	47
Upper Range Fork Length (mm):	55
Mean Wet Weight (g):	1.16

Mortality and Stressed Behaviour Information

Conc. (% v/v)	Mean Number of Fish at End of Test		Mean Rate of Fish at End of Test (%)	
	Dead	Stressed	Dead	Stressed
0	0	0	0	0
100	0	0	0	0

Reference Toxicant Test Results

Reference Toxicant:	Zinc Sulfate
Date Reference Toxicant Initiated:	8-Nov-17
Recent 96h Reference Toxicant Test LC50 (mg/L Zinc):	0.60
Lower 95% Confidence Limit (mg/L Zinc):	0.42
Upper 95% Confidence Limit (mg/L Zinc):	0.78
Historic Geometric Mean LC50 (mg/L Zinc):	0.47
Lower 95% Confidence Limit (mg/L Zinc):	0.15
Upper 95% Confidence Limit (mg/L Zinc):	1.51
Method of Calculation:	Stephan LC50 Program, Probit
Confirmed by Graph:	Yes

Sublethal Biological Effects

No sublethal biological effects observed.

Observations/Comments

No toxicity observed.

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L2025715-COFC

1

Report To		Report Format / Distribution		Service
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times)
Contact:	Travis Jobin	☐ PDF ☐ Excel ☐ Digital ☑ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-6003 Fax:	Email 3:	mskyring@kickinghorseresort.com	**Analysis Request**
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	RCR - Kicking Horse Mountain Resort	
Company:	Resorts of the Canadian Rockies	PO / AFE:		
Contact:	Patrick Majer	LSD:		
Address:	1505 - 17th Ave SW Calgary AB			
Phone:	Fax:	Quote #:	Q33059 – WASTEWATER	
Lab Work Order # (lab use only)		ALS Contact:	LS	Sampler: TJ

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	TSS	Fecal Coliforms	Total Coliforms	LC50	Number of Containers
	UV trough	Nov 21	1PM	Water	X				*	2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
	Nov 21			11/22	9:05	8 °C				

KICKING HORSE MOUNTAIN UTILITY CORPORATION
ATTN: TRAVIS JOBIN
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Date Received: 15-DEC-17
Report Date: 21-DEC-17 13:18 (MT)
Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2035816

Project P.O. #: NOT SUBMITTED
Job Reference: RCR - KICKING HORSE MOUNTAIN RESORT
C of C Numbers:
Legal Site Desc:

Nancy Sonompil, B. Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2035816-1 UV TROUGH							
Sampled By: TJ on 14-DEC-17 @ 13:30							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		15-DEC-17	R3917152
Orthophosphate-Dissolved (as P)	0.474		0.010	mg/L		16-DEC-17	R3914745
Coliform Bacteria - Fecal	36		1	CFU/100mL		15-DEC-17	R3914778
Phosphorus (P)-Total	0.588		0.020	mg/L	18-DEC-17	19-DEC-17	R3915799
Total Suspended Solids	3.7		3.0	mg/L		19-DEC-17	R3917197

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

Reference Information

Qualifiers for Individual Samples Listed:

Sample Numbe	Client ID	Qualifier	Description
L2035816-1	UV TROUGH	SPL	Total P - Sample was Preserved at the laboratory

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.

P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PO4-DO-COL-ED	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS

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

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

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

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

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

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

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.

Quality Control Report

Workorder: L2035816 Report Date: 21-DEC-17

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2

Contact: TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	**Water**							
Batch R3917152								
WG2688656-2 LCS								
Biochemical Oxygen Demand			104.2		%		85-115	15-DEC-17
WG2688656-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	15-DEC-17
FCC-MF-CL	**Water**							
Batch R3914778								
WG2685901-2 DUP		**L2035816-1**						
Coliform Bacteria - Fecal		36	29		CFU/100mL	22	65	15-DEC-17
WG2685901-1 MB								
Coliform Bacteria - Fecal			<1		CFU/100mL		1	15-DEC-17
P-T-COL-ED	**Water**							
Batch R3915799								
WG2686674-2 LCS		**KONELAB_TP**						
Phosphorus (P)-Total			100.3		%		80-120	19-DEC-17
WG2686674-1 MB								
Phosphorus (P)-Total			<0.020		mg/L		0.02	19-DEC-17
PO4-DO-COL-ED	**Water**							
Batch R3914745								
WG2685836-3 DUP		**L2035816-1**						
Orthophosphate-Dissolved (as P)		0.474	0.476		mg/L	0.5	20	16-DEC-17
WG2685836-2 LCS								
Orthophosphate-Dissolved (as P)			97.0		%		70-130	16-DEC-17
WG2685836-1 MB								
Orthophosphate-Dissolved (as P)			<0.010		mg/L		0.01	16-DEC-17
WG2685836-4 MS		**L2035816-1**						
Orthophosphate-Dissolved (as P)			N/A	MS-B	%		-	16-DEC-17
TSS-CL	**Water**							
Batch R3917197								
WG2687065-2 LCS								
Total Suspended Solids			98.4		%		85-115	19-DEC-17
WG2687065-1 MB								
Total Suspended Solids			<3.0		mg/L		3	19-DEC-17

Quality Control Report

Legend:

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

Sample Parameter Qualifier Definitions:

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

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS En

L2035816-COFC

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Page 1 of 1

Report To		Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Travis Jobin	☐ PDF	☐ Excel	☐ Digital	☑ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinghorseresort.com			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2:	pmajer@skircr.com			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-344-6003 Fax:	Email 3:	mskyring@kickinghorseresort.com			Analysis Request
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information				Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #:	RCR - Kicking Horse Mountain Resort			
Company:	Resorts of the Canadian Rockies	PO / AFE:				
Contact:	Patrick Majer	LSD:				
Address:	1505 - 17th Ave SW Calgary AB					
Phone:	Fax:	Quote #:	Q33059			
Lab Work Order # (lab use only)		ALS Contact:	LS	Sampler:	TJ	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	TSS	Fecal Coliform	~~Total Coliform~~	TOTAL P	ORTHO P							Number of Containers
	UV trough	DEC 13, 17	1330	Water	X	X	X		X	X							1
		Dec. 14 on bottles															

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
				12/15	9:15	4.7 °C				

GENF 20.00 Front

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.

INSURED'S FULL NAME AND MAILING ADDRESS

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

COMPANIES AFFORDING COVERAGE

COMPANY **A**	**Aviva Insurance**
COMPANY **B**	**Certain Lloyd's Underwriters through Lloyd's Approved Coverholder (Markel) as per Agreement No. MKL2017001, UMRB6027MKL2017001**
COMPANY **C**	**Certain 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	**A**	81229768	3/30/2018	3/30/2019	EACH OCCURRENCE	$ **2,000,000**
☐ CLAIMS MADE OR ☑ OCCURRENCE					GENERAL AGGREGATE	$ **5,000,000**
☑ PRODUCTS AND / OR COMPLETED OPERATIONS					PRODUCTS - Comp/Ops Agg.	$ **2,000,000**
☐ EMPLOYERS' LIABILITY					PERSONAL INJURY	$ **2,000,000**
☑ CROSS LIABILITY					TENANT'S LEGAL LIABILITY	$ **250,000**
☑ TENANT'S LIABILITY					MED EXP (any one person)	$ **10,000**
☑ NON-OWNED AUTOMOBILES					NON-OWNED AUTO	$ **2,000,000**
☐ ☑ HIRED					OPTIONAL POLLUTION LIABILITY EXTENSION	$
☐ POLLUTION LIABILITY EXTENSION					(Per Occurrence/Aggregate)	$
☑ CONTRACTUAL LIABILITY						
AUTOMOBILE LIABILITY						
☑ DESCRIBED AUTOMOBILES	**A**	6141184202	9/18/2017	9/18/2018	BODILY INJURY PROPERTY DAMAGE COMBINED	$ **2,000,000**
☐ ALL OWNED AUTOMOBILES					BODILY INJURY (Per Person)	$
☐ LEASED AUTOMOBILES					BODILY INJURY (Per Accident)	$
					PROPERTY DAMAGE	$
**ALL AUTOMOBILES LEASED IN EXCESS OF 30 DAYS WHERE THE INSURED IS REQUIRED TO PROVIDE INSURANCE						
EXCESS LIABILITY						$
☐ UMBRELLA FORM						$
☐ OTHER THAN UMBRELLA FORM						
(Specify)						
OTHER LIABILITY (SPECIFY)						$
☑ ENVIRONMENTAL CONSULTING PROFESSIONAL (ERRORS AND OMISSIONS) LIABILITY (Claims Made)	**C**	SRD485996	4/20/2017	4/20/2018	LIMIT/AGGREGATE	$ **2,000,000**
☑ ENVIRONMENTAL IMPAIRMENT LIABILITY (Claims Made)	**B**	EILT2093	4/1/2018	4/1/2019	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 1

To Whom It May Concern

CANCELLATION

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

SIGNATURE OF AUTHORIZED REPRESENTATIVE

FAX NUMBER
(403) 228-0231

EMAIL ADDRESS
esiver@toolepeet.com

PRINT NAME INCLUDING POSITION HELD
Erica Siver, Account Manager

COMPANY
Toole Peet & Co. Limited

DATE
April 3, 2018

COMPANY PROFILE

ENVIRONMENTAL DIAGNOSTICS INC. (EDI) was established in 1993. EDI is a Canadian-based company offering ***environmental and engineering services*** to commercial, industrial, oil & gas and government clients in Western Canada. The company has the main office located in Calgary and operations offices in Edmonton and Kamloops.

Environmental Diagnostics Inc. brings more than 20 years of experience and knowledge in many areas of the environmental and engineering sectors. EDI employees are dedicated to providing effective solutions to the clients' problems, implementing efficient and cost effective methods as well as an innovative approach.

All of EDI ***personnel*** are graduates of engineering and/or environmental science programs at recognized universities, colleges and reclamation/environmental programs. Our staff consists of experienced technicians, technologists, scientists and engineers, which are members of ***APEGGA, APEGBC, AIA, APEGS, ACPA, ACPBC, CRLA, AWWA, WEFTEC, WCWWA*** and others.

The ***company*** is an active member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta - ***APEGGA***, Association of Professional Engineers and Geoscientists of Saskatchewan - ***APEGS***, the Environmental Services Association of Alberta - ***ESAA***, the Canadian Land Reclamation Association - ***CLRA*** and the Alberta Petroleum Storage Systems Contractor's Association - ***APSSCA***.

The company possesses the ***Partnerships in Health & Safety*** Small Employer Certificate of Recognition - ***SECOR*** (currently working on ***COR***) and is a member of ***ISN***etworld.

EXPERIENCE OVERVIEW

ENVIRONMENTAL & CONTAMINATED LAND SITE ASSESSMENTS

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

RISK MANAGEMENT AND MITIGATION

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

REMEDIATION

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

SOIL VAPOUR SURVEYS & EVALUATION

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

INDOOR AIR QUALITY ASSESSMENT

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

HAZARDOUS BUILDING MATERIAL ASSESSMENT

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

EXPERIENCE OVERVIEW - continued

REGULATORY COMPLIANCE FOR FACILITIES (under AER and AEP)

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

ENGINEERING – WATER, WASTEWATER & CONTAMINATED WATER

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

COMPLIANCE TESTING & MONITORING

- Long Term Compliance Testing and Monitoring such as:
  - ✓ Water Distribution Systems
  - ✓ Water & Wastewater Treatment Plants Compliance Reports
  - ✓ Wastewater Irrigation Reports
  - ✓ Landfill Monitoring
  - ✓ Fuel Tank Sites Monitoring
  - ✓ Lead in Water Sampling
  - ✓ Surface Water Sampling
  - ✓ Snow & Snow Storage Sampling
- Various clients
  - ✓ Municipalities
  - ✓ Various Developments
  - ✓ Golf Courses
  - ✓ Resorts
  - ✓ Facilities

CORE PERSONNEL

Jana Zverina, P.Eng. (M.Sc. in Water Resources Engineering & Management and Diploma in Civil Engineering)
Manager of Environmental Engineering & Operations (Principal)

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

- ✓ Five years of process design, equipment selection, evaluation, pricing of industrial and municipal water & wastewater treatment, industrial water remediation including floatation sediment storage & transportation and mine rehabilitation work, environmental remediation including natural attenuation and containment for deep coal mines as a junior engineer
- ✓ Twenty five years as an environmental engineer including:
    - o Engineering and project management
    - o Thousands of environmental site assessments for oil & gas facilities, commercial and industrial sites & multi-residential site
    - o 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
    - o Specifications, budget proposals, cost estimates for hundreds of site abandonments projects including equipment dismantling, disposal, re-use, recycling
    - o 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
    - o Numerous soil and groundwater remediation projects employing various remediation methods for salt, hydrocarbons, solvents, fertilizers, herbicides/pesticides, heavy metals and others
    - o Completed numerous remediation projects within the proposed budget cost

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

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

- ✓ One year of analytical environmental laboratory experience
- ✓ Seven years as an environmental scientist including:
    - o 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
    - o 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
    - o Numerous soil and groundwater remediation projects employing various remediation methods for salt, hydrocarbons, chlorinated solvents, fertilizers, heavy metals, disulfides, and others
    - o Specifications, budget proposals, cost estimates for assessment
    - o Completed numerous remediation projects within the proposed budget cost

Lisa Columbus
Office Manager

Lisa has over 25 years of experience with office management, work and personnel organization, book-keeping and payroll

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:
  - o Hundreds of environmental site assessments, mitigation plans, risk management plans, soil and groundwater monitoring programs, reclamation and remediation assessments
  - o Specifications, budget proposals, cost estimates for assessment

Paul Sabau, (M.Sc. in Automatic Control & Pollution Prevention and B.Sc. in Environmental Sciences)
Environmental Consultant

Paul has over 10 years of environmental and geological experience in Alberta, BC & Saskatchewan. The following is the pertinent experience:

- o Numerous environmental site assessments, soil and groundwater monitoring programs, remediation supervision, hazardous materials assessment, indoor air and soil vapour sampling
- o Supervise drilling and coring operations
- o Sample soil, groundwater, surface water, subslab vapours and indoor air
- o Design pilot and bench tests for various innovative remediation methods
- o Complete semi-quantitative risk assessment for large waste management facilities

Samantha Thompson, (Diploma in Environmental Technology)
Samantha has been working as an environmental consultant for over 4 years. The following is the pertinent experience:

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

Magdalena Mazur, (B.Sc. in Environmental Science)

Magda has recently graduated from the University of Calgary

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

- o Water sampling and testing, analytical laboratory experience

Contract Employees:

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

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

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

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

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

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

RECENT PROJECTS

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

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

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

Example of some of the EDI long-term clients:

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

City of Airdrie
- Landfill monitoring
- Fleet yard tank nest monitoring

Oil & Gas Midstream and Upstream Clients

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

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

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

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