



2017 SEWAGE TREATMENT PLANT ANNUAL REPORT

Prepared for:

KICKING HORSE MOUNTAIN UTILITIES CORP.

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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 m³/d

BOD₅ Five day biochemical oxygen demand, measured in mg/l

TSS Total suspended solids or non filterable residue, measured in mg/l

NH₃ Ammonia concentration, expressed as nitrogen in mg/l
 NO₃ Nitrate concentration, expressed as nitrogen in mg/l
 NO₂ 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

Enterococci

E. Coli

Bacterial concentration, measured as colony forming units per 100ml
Bacterial concentration, measured as colony forming units per 100ml
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	m³/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.



<u>Table 2</u>
Sampling Location/Frequency/Type

			Location		
Parameter	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	River side channel	Effluent
EMS Number	E256694	E258898	E258899	E258897	E256696
	Winter/Summer	Winter/Summer	Winter	Summer	Winter/Summer
pН	WS/G	WS/G	WS/G	WS/G	W
Temp	WS/G	WS/G	WS/G	WS/G	W
Flow	/	/	/	/	W
BOD₅	/	/	/	/	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
NO₃-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



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3.0 SEWAGE FLOW RECORDS

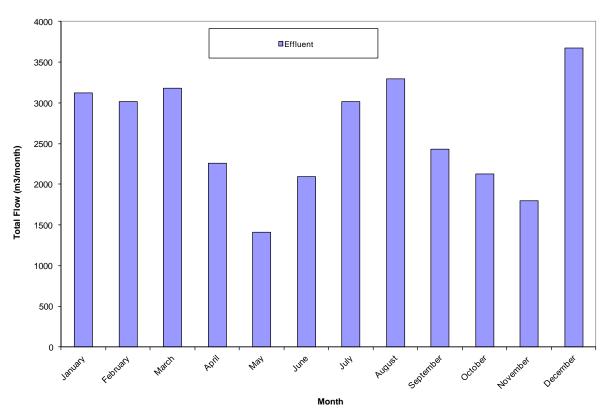
This section provides data and analysis regarding plant effluent flows, and compares 2017 data to the previous years.

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 m³ with an average of 85.9 m³/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 m³/day compared to 65.52 m³/day over the same period in 2016, 81.79 m³/day in 2015, 74.10 m³/day in 2014, 47.73 m³/day in 2013, 72.41 m³/day in 2012, 165.2 m³/day in 2011 (note that data for Dec was missing) and 108.5 m³/day in 2010. Peak flow for the year reached 244 m³/day, which is well below the allowable limit of 300 m³/day limit. The peak flow is slightly higher than previous years which were 162.25 m³/day in 2016, 137.32 m³/day in 2015, 145.71 m³/day in 2014,165.03 m³/day in 2013, 159.05 m³/day in 2012, 311.54 m³/day in 2011 (again note that the data for one of the historically highest months, December was missing), 317.6 m³/day in 2010 and 251.3 m³/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

.,	Sewage FI	ay)	Days	
Year	Total	Average	Peak	Over Limit
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
- 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 m³/day and on December 31st at 251.3 m³/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 m³/day, February 14th at 206.4 m³/day, and on December 31st at 317.6 m³/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 m³/day and the second highest peak was observed on New Year's Day at 303.04 m³/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 m³/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 m³/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 m³/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 m³/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 m³/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.

 $\label{eq:Figure 2}$ Average and Peak Sewage Effluent Flow Comparison Graph

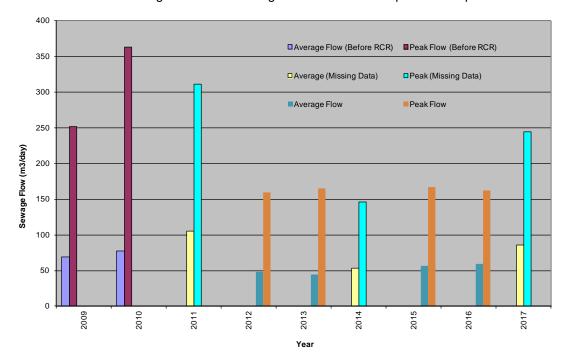


Figure 3

Total Sewage Effluent Flow Graph:

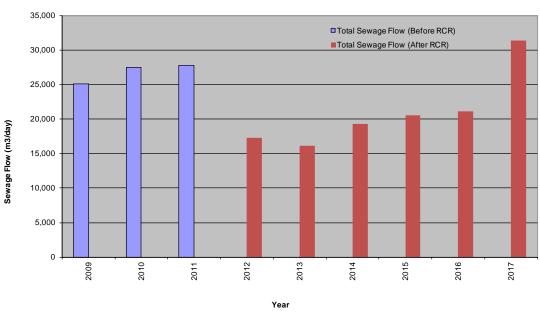
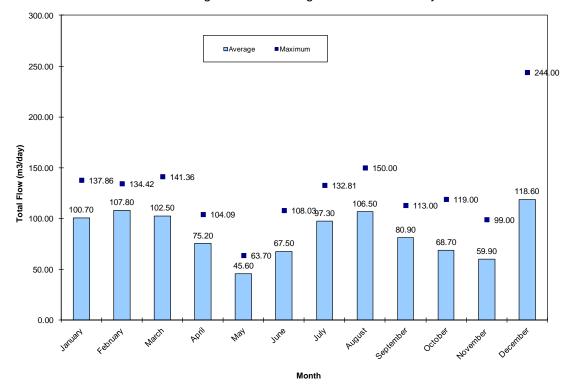




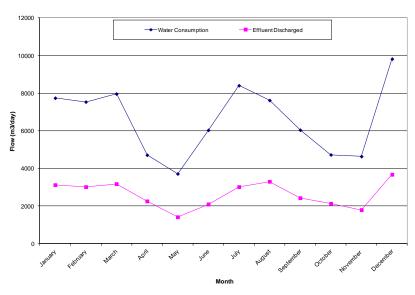
Figure 4
2017 Sewage Effluent Average and Peak Flows by Month



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 m³/day. Using the actual peak flow of 312 m³/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 m³/day if the flow restriction measures prove sustainable. Sewage discharge rates will be monitored and an application will be submitted to increase the maximum daily discharge when warranted.

Based on 2017 flow data, the plant has an unused capacity of 56 m³/day (based on an operating limit of 300 m³/day) due to the flow saving measures. This still needs to be closely monitored during 2018 and further considered when adding additional development.

<u>Table 4</u> Projected Peak Flows: 2011-2018

	2011	2012	2013	2014
Estimated Wastewater Flow (m³/day)	705.5*	705.5*	705.5*	705.5
Actual and Corrected (m³/day)	312** (a)	159 (a)	165 (a)	146 (a)

	2015	2016	2017	2018
Estimated Wastewater Flow (m³/day)	705.5	705.5	705.5	705.5
Actual and Corrected (m³/day)	167 (a)	162 (a)	244 (a)	190 (b)

^{*}the number was calculated based on 2014 occupancy, which is likely overestimated



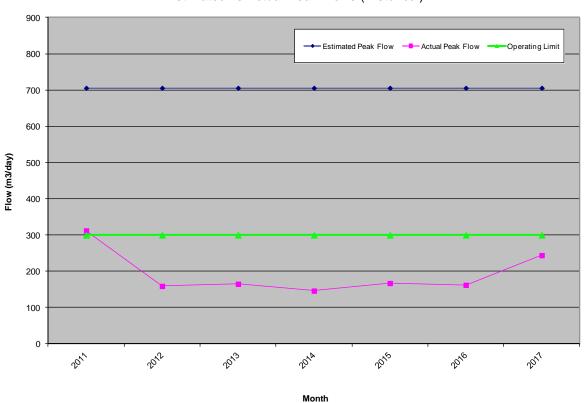
^{**}the number does not reflect a true peak as all the data was not available during the high flow months

- (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	66	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.

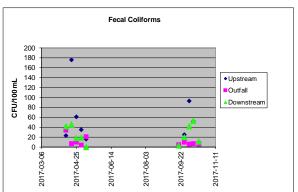
Although several spikes were observed for several parameters, the averages this year are comparable to previous years. There does not seem to be any correlation with the spikes in the river samples with the levels found in the effluent on the same days.

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



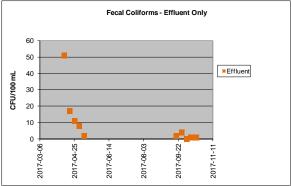
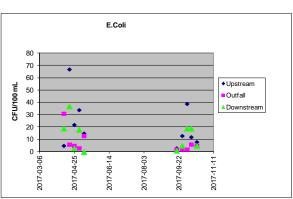


Figure 8a & 8b

E.Coli Levels in the Columbia River and the Effluent



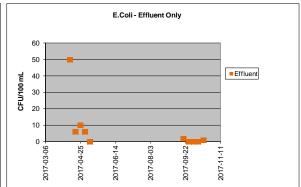
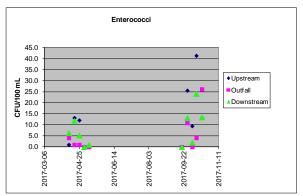


Figure 9a and 9b

Enterococci Levels in the Columbia River and the Effluent



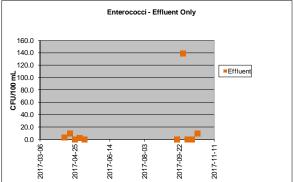




Table 5

2017 Columbia River Sample Results

Sample Date		NH ₃			Ortho-P		Fed	al Colife	orm		E.Coli		То	tal P mg	g/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		pН			TSS			N-NO ₃			N-NO ₂		Eı	nterococ	ci
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	1	-	-
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	ı	-	-
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

Doto						2017 E	ffluent Res	sults Summ	ary				
Date	Flow	Temp	рН	NH ₃ -N	BOD	P-OP04	Coliforms	E.Coli	Total P	TSS	NO ₃ -N	NO ₂ -N	Enterococci
yyyy/mm/dd	m³/d	С		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	1	-	8.3	1.090	178	•	1.790	19.7	1	-	-
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	-	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

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.



^{2.} Geometric mean is used to coliform results

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 phosphorus 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



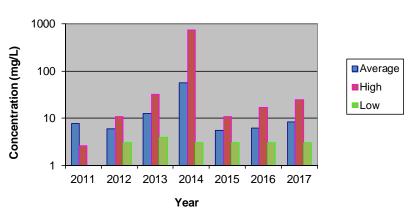




Figure 11 NO3-N

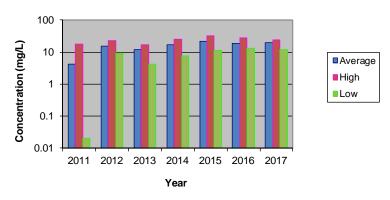
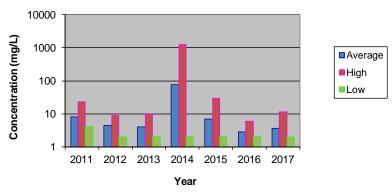


Figure 12 BOD



6.2 COMPLIANCE SUMMARY

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

<u>Table 8</u>
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	1	Non-toxic	1	Pass	Pass	0



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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.

<u>Table 9</u>
2017 Pumped Solids Data

Month	Vol. Pumped (m³)
January	298
February	250
March	345
April	117
Мау	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.



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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

Total Phosphorus

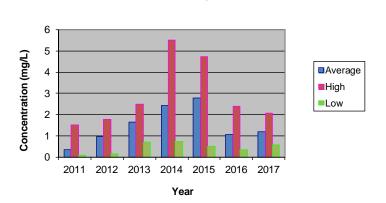




Figure 14
Ortho Phosphorus Levels 2011-2017

Ortho Phosphorus

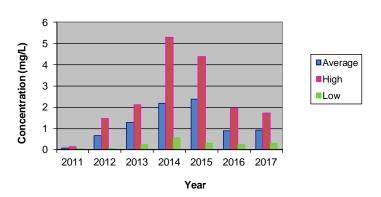
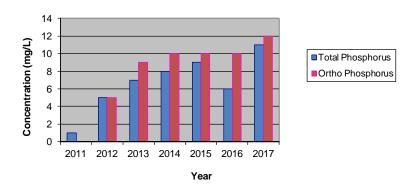


Figure 15

Days over Limit 2011-2017

Days Over Limit



10.0 ASSESSMENT SUMMARY

The total effluent flow recorded for 2017 was 31,431.05 m³ with an average of 85.9 m³/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.



W2012-003 Kicking Horse Mountain Utilities Corp 2017 Sewage Treatment Plant Annual Report April 2018

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.

30366

ENVIRONMENTAL DIAGNOSTICS INC.

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

Jana Zverine, M.Sc., P. Eng. Senior Environmental Engineer

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*										
Single Family Sub-Division	(I/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*										
Multi-railing Offits	(I/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 Hears	Flow*	Population								
Day Users	(l/unit/day)	(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* (I/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

Diving Facilities/Bara	Flow*	Area								
Dining Facilites/Bars	(l/m²/day)	(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

	705.5							
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

April 2018 W2012-003

^{**} 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





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.

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



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.

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.

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

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



L1876098 CONTD.... PAGE 2 of 3 Version: FINAL

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.

L1876098 CONTD....

PAGE 3 of 3 Version: FINAL

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 contain the samples are subject to contain the samples are received by the laboratory.

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



Workorder: L1876098

Report Date: 11-JAN-17

Page 1 of 2

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 R3630								
WG2462283-2 LC Biochemical Oxyger	-		98.4		%		85-115	05-JAN-17
WG2462283-1 MI Biochemical Oxyger			<2.0		mg/L		2	05-JAN-17
TSS-CL	Water							
Batch R3629	242							
WG2461255-2 LC Total Suspended So	_		90.7		%		85-115	06-JAN-17
WG2461255-1 MI Total Suspended So			<3.0		mg/L		3	06-JAN-17

Workorder: L1876098 Report Date: 11-JAN-17 Page 2 of 2

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS) Environmental

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

L1876098-COFC

Page <u>1</u> of <u>1</u>

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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

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L1885862 CONTD.... PAGE 2 of 3 Version: FINAL

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
LARGERCO A LIV TROUGH							
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
							110011101

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

L1885862 CONTD....

PAGE 3 of 3 Version: FINAL

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 IncubO2 electrode

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

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

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

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.



Workorder: L1885862

Report Date: 07-FEB-17

Page 1 of 2

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 R3647								
WG2475427-2 LC Biochemical Oxyger	_		98.0		%		85-115	01-FEB-17
WG2475427-1 MI Biochemical Oxyger			<2.0		mg/L		2	01-FEB-17
FCC-MF-CL	Water							
Batch R3646	043							
WG2474530-2 DL		L1885862-1						
Coliform Bacteria - I		224	208		CFU/100mL	7.4	65	01-FEB-17
WG2474530-1 MI Coliform Bacteria - I			<1		CFU/100mL		1	01-FEB-17
P-T-COL-CL	Water							
Batch R3647	888							
WG2475851-2 LC Phosphorus (P)-Tot	-		106		%			07-FEB-17
WG2475851-1 MI Phosphorus (P)-Tot			<0.0050		mg/L		0.005	07-FEB-17
PO4-DO-COL-CL	Water							
Batch R3645	779							
WG2473938-10 LC	-							
Orthophosphate-Dis	ssolved (as P)		106.8		%		80-120	02-FEB-17
WG2473938-9 MI Orthophosphate-Dis			<0.0050		mg/L		0.005	02-FEB-17
TSS-CL	Water							
Batch R3647	494							
WG2475555-5 LC	s							
Total Suspended So	olids		92.9		%		85-115	05-FEB-17
WG2475555-4 MI Total Suspended So			<3.0		mg/L		3	05-FEB-17

Workorder: L1885862 Report Date: 07-FEB-17 Page 2 of 2

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS Envir



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

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Page <u>1</u> of <u>1</u>

Report To					Report Fo	ormat / Distribu	tion		Serv	ice R	eque	sted	(Rush	for ro	utine a	analysi	s subj	ect to a	ıvallat	oility)	_
Company:	Kicking Horse Mou	ntain Water Util	ity Co. Ltd.		✓ Standard	Other	•		R₁	egular ((Standa	ard Tu	marour	id Time	s - Bus	siness D	ays)				
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Phone:	250-344-6003	Fax:	-		Email 3:	mskyring@kick	inghorseresort.co	<u>om</u>		-						eques					
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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

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L1895421 CONTD.... PAGE 2 of 3 Version: FINAL

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1895421-1 UV TROUGH							
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)		DLA				28-FEB-17	
Coliform Bacteria - Fecal	1.09	DLM	0.050	mg/L CFU/100mL		28-FEB-17	R3664463
Phosphorus (P)-Total	178	DLM	2				R3664869
	1.79	DLA	0.010	mg/L		06-MAR-17	R3668806
Total Suspended Solids	19.7		3.0	mg/L		03-MAR-17	R3668287
		<u> </u>					

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

L1895421 CONTD....
PAGE 3 of 3
Version: FINAL

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 IncubO2 electrode

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

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

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.



Workorder: L1895421

Report Date: 07-MAR-17

Page 1 of 2

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

Workorder: L1895421 Report Date: 07-MAR-17 Page 2 of 2

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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

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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:

Lundrade Chuete D.Co

Lyudmyla Shvets, B.Sc. Account Manager

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L1906927 CONTD.... PAGE 2 of 3 Version: FINAL

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1906927-1 UV TROUGH							
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.

L1906927 CONTD....

PAGE 3 of 3 Version: FINAL

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 Parame	eter Qualifier Kev:		

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 IncubO2 electrode					

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

FCC-MF-CL Water Fecal Coliform Count-MF

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

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

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

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.



Workorder: L1906927

Report Date: 06-APR-17

Page 1 of 2

Client:

KICKING HORSE MOUNTAIN UTILITY CORPORATION

1505 - 17th AVENUE SW CALGARY AB T2T 0E2

Contact: TRAVIS JOBIN

Test M	latrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
Batch R3692336	Vater							
WG2505425-2 LCS Biochemical Oxygen Dema	and		82.9	LCS-ND	%		85-115	30-MAR-17
WG2505425-1 MB Biochemical Oxygen Dema	and		<2.0		mg/L		2	30-MAR-17
FCC-MF-CL V	Vater							
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 V	Vater							
Batch R3688844 WG2503553-2 LCS Phosphorus (P)-Total			87.9		%		00.400	04 144 5 47
WG2503553-1 MB			87.9		%		80-120	31-MAR-17
Phosphorus (P)-Total			<0.0050		mg/L		0.005	31-MAR-17
PO4-DO-COL-CL V	Vater							
Batch R3687764								
WG2502957-4 DUP Orthophosphate-Dissolved	(as P)	L1906927-1 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 V	Vater							
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

Workorder: L1906927 Report Date: 06-APR-17 Page 2 of 2

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

Sample Parameter Qualifier Definitions:

LCSD Laboratory Control Sample Duplicate

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS Environmental

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



COC#

Page	1 of	1

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Contact:	Patrick Majer		LSD:]				\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				i l			
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Released by:		Date (dd-mmm-yy) Time (hh-mm)	Received by	Date: 7	Time:	Temperature:	Verif	red by	:	Ī	Date	:	Tir	ne:		Observ		ns:
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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.

Lyudmyla Shvets, B.Sc. Account Manager

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

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



L1911339 CONTD.... PAGE 2 of 5 Version: FINAL

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1911339-1 WWTP EFFLUENT - UV TROUGH TEM	P: 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			0.020				
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				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		44 455 47	
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	0.132		0.030	IIIg/L		12-7(110-17	
Nitrite (as N)	<0.010		0.010	mg/L		11-APR-17	R3698416
L1911339-3 COLUMBIA RIVER DOWN STREAM TE	-						
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.

L1911339 CONTD.... PAGE 3 of 5 Version: FINAL

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 R3698 R3698	Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: TJ/MS on 10-APR-17 @ 14:00 Matrix: WATER Nitrite in Water by IC Nitrite (as N)	L1911339-3 COLUMBIA RIVER DOWN STRFAM TF	MP: 7.0C PH: 7.8						
Matrix: WATER Nitrite in Water by IC Nitrate in Water by IC Nitrate and Nitrite (as N) 0.010 mg/L 11-APR-17 R3698 L1911339-4 COLUMBIA RIVER SIDE CHANNEL TEMP: 7.7C PH: 7.8 Sampled By: TJ/MS on 10-APR-17 @ 14:00 12-APR-17 R3698 Matrix: WATER WATER WATER WATER VATER								
Nitrite in Water by IC Nitrite (as N) <0.010 mg/L 11-APR-17 R3698 L1911339-4 Sampled By: Matrix: WATER Miscellaneous Parameters Ammonia, Total (as N) 0.082 0.0050 0.050 mg/L 12-APR-17 R3698 R3698 Orthophosphate-Dissolved (as P) <0.0050 0.0050 0.0050 mg/L 11-APR-17 R3698 R3698 Enterococcus Colliform Bacteria - Fecal MPN - E. coli 31 See Attached 0.0050 1 CFU/100mL 11-APR-17 11-APR-17 R3701 R3701 Phosphorus (P)-Total Total Suspended Solids Nitrate in Water by IC Nitrate (as N) 0.100 0.020 0.050 mg/L 0.020 11-APR-17 R3698 R3698 R3698 Nitrate and Nitrite Nitrite in Water by IC Nitrite in Water by IC 0.100 0.050 0.050 mg/L 0.050 11-APR-17 R3698 R3698 R3698								
Nitrite (as N)								
Sampled By: TJ/MS on 10-APR-17 @ 14:00 Matrix: WATER Miscellaneous Parameters 0.082 Ammonia, Total (as N) 0.082 Orthophosphate-Dissolved (as P) <0.0050		<0.010		0.010	mg/L		11-APR-17	R3698416
Matrix: WATER Miscellaneous Parameters 0.082 0.050 mg/L 12-APR-17 R3698 Orthophosphate-Dissolved (as P) <0.0050		MP: 7.7C PH: 7.8						
Miscellaneous Parameters Ammonia, Total (as N) 0.082 0.050 mg/L 12-APR-17 R3698 Orthophosphate-Dissolved (as P) <0.0050								
Ammonia, Total (as N) 0.082 0.050 mg/L 12-APR-17 R3698 Orthophosphate-Dissolved (as P) <0.0050								
Orthophosphate-Dissolved (as P) <0.0050							10 100 17	
Enterococcus					_			R3698941
Coliform Bacteria - Fecal 35 OCR 1 CFU/100mL 11-APR-17 R3701 MPN - E. coli 31 OCR 1 MPN/100mL 11-APR-17 R3701 Phosphorus (P)-Total 0.0138 0.0050 mg/L 15-APR-17 R3701 Total Suspended Solids <10				0.0050	mg/L			R3696962
MPN - E. coli 31 OCR 1 MPN/100mL mg/L 11-APR-17 R3700 Phosphorus (P)-Total Total Suspended Solids <10			000					R3703580
Phosphorus (P)-Total 0.0138 0.0050 mg/L 15-APR-17 R3701 Total Suspended Solids <10								R3701166
Total Suspended Solids			OCR					R3700903
NO2, NO3 and Sum of NO2/NO3 0.100 0.020 mg/L 11-APR-17 R3698 Nitrate (as N) 0.100 0.050 mg/L 12-APR-17 Nitrate and Nitrite (as N) 0.100 0.050 mg/L 12-APR-17 Nitrite in Water by IC 0.050 mg/L 12-APR-17					_			R3701492
Nitrate in Water by IC 0.100 0.020 mg/L 11-APR-17 R3698 Nitrate +Nitrite Nitrate and Nitrite (as N) 0.100 0.050 mg/L 12-APR-17 Nitrite in Water by IC		<10		10	mg/L		15-APR-17	R3701592
Nitrate (as N) 0.100 0.020 mg/L 11-APR-17 R3698 Nitrate+Nitrite 0.100 0.050 mg/L 12-APR-17 Nitrite in Water by IC 0.050 mg/L 12-APR-17								
Nitrate+Nitrite Nitrate and Nitrite (as N) Nitrite in Water by IC 0.100 0.050 mg/L 12-APR-17		0.100		0.020	ma/L		11-APR-17	R3698416
Nitrate and Nitrite (as N) 0.100 0.050 mg/L 12-APR-17 Nitrite in Water by IC		3.100		0.020	g, =			.10000410
Nitrite in Water by IC		0.100		0.050	mg/L		12-APR-17	
Nitrite (as N) < 0.010								
	Nitrite (as N)	<0.010		0.010	mg/L		11-APR-17	R3698416

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

L1911339 CONTD....

PAGE 4 of 5 Version: FINAL

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:

POD PC CI Water Piechamical Owigen Demand (POD) APHA 5210 P. E. day Insula O2 electrode	ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL Water Biochemical Oxygen Demand (BOD) AFITA 5210 B-3 day incub02 electrode	BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode

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

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 APHA 4500 NH3-NITROGEN (AMMONIA) Water Ammonia, Total (as N)

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-CI 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 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
Objective of Occasion the Normalisms	

Chain of Custody Numbers:

L1911339 CONTD....

Reference Information

PAGE 5 of 5 Version: FINAL

Test Method References:

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

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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

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

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



Workorder: L1911339

Report Date: 20-APR-17

Page 1 of 3

Client: KICKING HORSE MOUNTAIN UTILITY CORPORATION

1505 - 17th AVENUE SW CALGARY AB T2T 0E2

Contact: TRAVIS JOBIN

Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
Water							
nand		90.6		%		85-115	11-APR-17
nand		<2.0		mg/L		2	11-APR-17
Water							
		<1		MPN/100mL		1	11-APR-17
Water							
		<1		CFU/100mL		1	11-APR-17
Water							
		100.4		%		85-115	12-APR-17
		<0.050		mg/L		0.05	12-APR-17
Water							
		102.7		%		90-110	11-APR-17
		<0.010		mg/L		0.01	11-APR-17
Water							
		106.0		%		90-110	11-APR-17
		<0.020		mg/L		0.02	11-APR-17
Water							
		85.5		%		80-120	15-APR-17
	Water and and Water Water Water Water	Water and and Water Water Water Water	Water and 90.6 and <2.0 Water <p>41 Water 100.4 <0.050 Water 102.7 <0.010 Water 106.0 <0.020 Water</p>	Water and 90.6 and <2.0 Water <p>**** *** *** *** *** *** *** *** *** *</p>	Water Water % and <2.0	Water Water and 90.6 % and <2.0	Water Water 85-115 and <2.0



Workorder: L1911339

Report Date: 20-APR-17 Page 2 of 3

Test M	atrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-CL W	/ater							
Batch R3701492								
WG2511538-1 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	15-APR-17
PO4-DO-COL-CL W	/ater							
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 W	/ater							
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

Workorder: L1911339 Report Date: 20-APR-17 Page 3 of 3

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

Sample Parameter Qualifier Definitions:

LCSD Laboratory Control Sample Duplicate

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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



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



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:

Sampl	e 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 $41 \pm 1^{\circ}$ 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



GENF 20.00 Front

L1911339-COFC Report Format / Distribution Servir Report To Kicking Horse Mountain Resort Utility Corporation 5tandard Other (a) Regular (accommon a ambiticano anno antico Company [-] Fax 🔘 Prionty (2-4 Business Days) - 50% Suicharge - Contact ALS to Confirm TAT Travis Jobin Excel [| Digital Contact: i PDF 1500 Kicking Horse Trail O Emergency (1-2 Bus. Davs) - 100% Strickarge - Contact ALS to Confirm TAT Address: Email 1: tjobin@kickinghorseresort.com Same Day or Weekend Emergency - Contact ALS to Confirm TAT pmajer@skircr.com Email 2: Analysis Request Phone: 250-344-8442 Fax: Email 3: mskyring@kickinghorseresort.com Please indicate below Filtered, Preserved or both (F, P, F/P) [√] № Ties Invoice To Same as Report ? Client / Project Information Week 1- 2017 Spring EMS program - WW Hardcopy of Invoice with Report? 705 l No Joh#: PO / AFE: Resorts of the Canadian Rockies Company: Contact: Patrick Majer SD: Number of Containers Address 1505 - 17th Ave SW Calgary AB Phone: Fax: Quote #: Lab Work Order # LS T./MS Sampler: (labiuse only) Contact: Sample ... Sample Identification Ortho Date Time Total Sample Type (dd-:nmm-yy) (ramol) (This description will appear on the report) 4 W. I WWTP Effluent - UV trough Х Х Х Х Χ Х Х 5 V√ater Х X 10-Apr-17 1330 Χ Х Х Χ Х Χ 4 Columbia River Upstream Х Х ZEM 10-Apr-17 Wate: X Х Х Х Х X 4 Columbia River Down stream Temp: 7.() 10-Apr-17 2 PM Weter X 7 6~ χ Х Х Х Х Х Χ 4 Columbia River Side Channel 10-Apr-17 Vvater Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc.) / Hazardous Details Faither 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) (at 11 A SHIPMENT RECEPTION (lab use only) Observations: Date: Received by: Temperature. Verified by: Released by: Date (dd-main yy) | Time (hh-nim) Yes / No ? if Yes add S!F



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

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L1914350 CONTD.... PAGE 2 of 5 Version: FINAL REV.

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		0.020	9.		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	0.0		0.0				1107 0007 0
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	m~/!		19-APR-17	R3703459
	0.061		0.010	mg/L		19-APK-17	K3703459
L1914350-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/PAG on 18-APR-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters	0.005		0.050			00 ADD 47	D070007
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	OCR	4	CFU/100mL		19-APR-17	R3710104
Coliform Bacteria - Fecal MPN - E. coli	176	OCR	1	MPN/100mL		19-APR-17 19-APR-17	R3703572
Phosphorus (P)-Total	67	OCK	1				R3703569
,	0.0289		0.0050	mg/L		24-APR-17	R3707926
Total Suspended Solids NO2, NO3 and Sum of NO2/NO3	18.3		3.0	mg/L		19-APR-17	R3703375
Noz, Nos and Sum of Noz/Nos 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							
						I .	1
Nitrate in Water by IC	0.400		0.000	m = /1		10 ADD 17	D2702450
Nitrate in Water by IC Nitrate (as N) Nitrate+Nitrite	0.128		0.020	mg/L		19-APR-17	R3703459

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

L1914350 CONTD.... PAGE 3 of 5 Version: FINAL REV.

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							
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	0.091		0.020	iiig/L		13-At 13-17	13703438
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.

L1914350 CONTD....

Reference Information

PAGE 4 of 5 Version: FINAL REV

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 IncubO2 electrode

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

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

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:		

L1914350 CONTD....

PAGE 5 of 5 Version: FINAL REV

Reference Information

Test Method References:

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

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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

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

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



Workorder: L1914350

Report Date: 01-MAY-17

Page 1 of 3

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 Den	nand	4.8	4.1		mg/L	17	20	19-APR-17
WG2516108-2 LCS Biochemical Oxygen Den	nand		86.4		%		85-115	19-APR-17
WG2516108-1 MB Biochemical Oxygen Der	nand		<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			100.0		0/			
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		٧٥.٥٥٥		mg/L		0.03	20-AFN-17
Batch R3703459	water							
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							00 110	10 / 11 11-17
Nitrate (as N)			<0.020		mg/L		0.02	19-APR-17
P-T-COL-CL	Water							



Workorder: L1914350

Report Date: 01-MAY-17 Page 2 of 3

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-CL	Water							
Batch R370792	6							
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 R370356	1							
WG2513724-2 LCS Orthophosphate-Disso			99.7		%		80-120	19-APR-17
WG2513724-1 MB Orthophosphate-Disso	olved (as P)		<0.0050		mg/L		0.005	19-APR-17
TSS-CL	Water							
Batch R370337	5							
WG2514112-2 LCS Total Suspended Solid	ds		108.3		%		85-115	19-APR-17
WG2514112-1 MB Total Suspended Solid	ds		<3.0		mg/L		3	19-APR-17

Workorder: L1914350 Report Date: 01-MAY-17 Page 3 of 3

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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



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

2017/04/19, 1340 2017/04/26 FINAL

Test Report

Client: Reference: ALS106 1617-0882

Billing:

L1914350

Destatavet

Senior Verifier



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

D	00		It:
n	C 3	u	IL.

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.



Chain of Custody / Analytical Re Canada Tull Free: 1 860 St www.alsglobal.com



COC#

Page <u>1 ef _ 1</u>

Report To		Report Fo	rmat / Distribut	ion								na a:	ne!ysis	subie	ct to avail	sbility)	
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Address:	1500 Kicking Horse Trail	Email 1	tiobin@kickingh	orseresort.com		() En	ergen	cy (1-2	Sus. D	ays) - 1	00:55	Surcharg	ge - Cc:	itaut AL	S to Confi	m 7.AT	
		Emeli 2:	pmajer@skircr.c	com		⊜ Sa	me Da	r or We	ekend	Emerqe	ency - (Contact	ALS to	Confirm	1 TAT		
Phone:	250-344-8412 Fax:	Email 3:	pallardgaudreau	u@kickinghorser	esort.com	<u>j</u>				Α	nalys	is Re	quest				$\equiv 1$
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Sample 3			Date (dd-mmm-yy)	Time (tht:mm)	Sample Type	9009	155	N-1.14	N-N03	N-N02	o'al P	Orthe P	Fecal Coilforn	Enterococci	نَّا		equak
X (P. 3	WWTP Efficient - UV trough Temp: pH:		18-Apr-17	1pm	Water	X	Х	X	X	X	X	×	x	X.	X	1-1	5
5X) 32#	Columbia Fiver Upstream Temp (0,7 pH: 7%		18-Ap:-17	2pm	Water		X	X	Х	х	Х	χ	X	X	X	+-1	4
# . *	Columbia River Down stream Temp:[[,6 pH: 7.8		18-Apr-17	2pm	Water	_	Х	Х	Х	×	X	_X	X	X	X		4
	Columbia River Side Chandel Temp (1.8 pH: 7.8		18-Apr-17	2pm	Water	 	X	Х	Х	X	X	у.	X	Х	x		4
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Please return	fresh bottles for next weeks sampling- Thanks																
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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

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L1917509 CONTD.... PAGE 2 of 5 Version: FINAL REV.

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	ma/l		27-APR-17	
` '	0.115		0.050	mg/L		21-APK-1/	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		26-APR-17	R3709205
L1917509-3 COLUMBIA RIVER DOWN STREAM	10.010		0.010	9, =			.107.00200
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		0.0000	g/ L		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	R3709336
Phosphorus (P)-Total	0.0143		0.0050	mg/L		01-MAY-17	R3711142
. , ,			3.0	mg/L		01-WAT-17 02-MAY-17	R3711142
Total Suspended Solids	36 0		ა.0	mg/L		02-IVIA 1-17	137 12024
Total Suspended Solids NO2 NO3 and Sum of NO2/NO3	36.0						
NO2, NO3 and Sum of NO2/NO3 Nitrate in Water by IC			0.020	mg/l		26-APD 17	D2700205
NO2, NO3 and Sum of NO2/NO3	36.0 0.141		0.020	mg/L		26-APR-17	R3709205

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

L1917509 CONTD.... PAGE 3 of 5 Version: FINAL REV.

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				,,		04 1443/ 47	D
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 26-APR-17	R3709358
Enterococcus Coliform Bacteria - Fecal	See Attached	OCR	4	CFU/100mL			R3714485
MPN - E. coli	10 5	OCR	1 1	MPN/100mL		26-APR-17 26-APR-17	R3709336 R3709314
Phosphorus (P)-Total	0.0077	JOIN	0.0050	mg/L		01-MAY-17	R3711142
Total Suspended Solids	16.0		3.0	mg/L		01-MAY-17	R3711142
NO2, NO3 and Sum of NO2/NO3	10.0		5.0	ilig/L		02 WIA 1-11	1101 12024
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.

L1917509 CONTD....

Reference Information

PAGE 4 of 5 Version: FINAL REV

Sample Parameter Qualifier Kev:

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 IncubO2 electrode

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

EC-MPN-CL Water MPN - E. coli

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 APHA 4500 NH3-NITROGEN (AMMONIA) Ammonia, Total (as N)

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

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

TSS-CL Total Suspended Solids APHA 2540 D-Gravimetric

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	

Chain of Custody Numbers:

L1917509 CONTD....

Reference Information

PAGE 5 of 5 Version: FINAL REV

Test Method References:

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

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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

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

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



Workorder: L1917509

Report Date: 04-MAY-17

Page 1 of 3

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 De	emand		91.5		%		85-115	27-APR-17
WG2520985-1 MB Biochemical Oxygen De	emand		<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 - Feca	al		<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 Ammonia, Total (as N)		L1917509-3	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							



Workorder: L1917509

Report Date: 04-MAY-17 Page 2 of 3

Test Matrix	x Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-CL Wate	r						
Batch R3711142							
WG2520251-3 DUP Phosphorus (P)-Total	L1917509-4 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 Phosphorus (P)-Total	L1917509-4	94.4		%		70-130	01-MAY-17
PO4-DO-COL-CL Wate	r						
Batch R3709358							
WG2518367-6 LCS Orthophosphate-Dissolved (as I	P)	90.9		%		80-120	26-APR-17
WG2518367-5 MB Orthophosphate-Dissolved (as I	P)	<0.0050		mg/L		0.005	26-APR-17
TSS-CL Wate	r						
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				-			

Workorder: L1917509 Report Date: 04-MAY-17 Page 3 of 3

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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



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

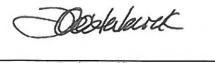
2017/04/26, 1200 2017/05/03 FINAL

Test Report

Client: Reference:

Billing:

ALS106 1617-0911 L1917509



Senior Verifier



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	t:
--------	----

imple	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.

S) Environmental

www.alsglobal.cor



COC#

L1917509-COFC Page 1 of

Report To		Report Fc	ormat / Distributi	ion		tine analysis subject to availability) Regular (Standard Turnaround Times - Business Days)												
	Kicking Horse Mountain Resort Utility Corporation	Standard	d Other			● Re	gular (f	Standa	rd Turr	narouni	d Time							ヿ
	Travis Jobin	PDF	Excel	☐ Digital	✓ Fax	O Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT												
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	Same as Report? Yes V No	Client / Project Information					ase in	dicat	e belo	w Filt	tered,	Pres	erved	or b	oth (F,	, P, F/	/P)	\neg
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(lab	use only)	Contact:	LS	Sampler:	T3/CV	1			.			<u> </u>	<u>₽</u>	8	,		1	₹
Sample	Sample Identification	ــــــــــــــــــــــــــــــــــــــ	Date	Time		ro l		4.	اج ا	8	۵	٦	<u> </u>	ğ	. <u>.</u>			Бе
#	(This description will appear on the report)		(dd-mmm-yy)	(hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-N02	Total	Ortho P	Fecal Coliform	Enterocacci	E Coli			Number of Containers
	WWTP Effiuent - UV trough Temp: 12 pH: 6.8		API 25	2:00 PM	Water	X	X	X	X	X	X	x	X	Х	X	+		5
	Columbia River Upstream Temp: (pH: 7,5		APR 25	3.00PM	Water		Х	Х	Х	х	Х	Х	Х	Х	х		+	4
	Columbia River Down stream Temp: () pH: 7, 8.		APR 25	3:00 PM	Water		х	Х	Х	Х	X	х	X	Х	X	\dashv	+	4
	Columbia River Side Channel Temp: 11 pH: 7,8		APR 25	3:00PM	Water		Х	х	х	Х	Х	Х	Х	Х	Х	-+	+	4
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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

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

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



L1920544 CONTD.... PAGE 2 of 5 Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1920544-1 WWTP EFFLUENT - UV TROUGH TEMI	P: 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						00 1441/ 47	
Nitrite (as N)	<0.010		0.010	mg/L		03-MAY-17	R3715508
L1920544-3 COLUMBIA RIVER DOWN STREAM TE	MP: 12 PH: 7.8						
Sampled By: TJ on 02-MAY-17 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters	2.25		0.050			00 84837 47	D0740700
Ammonia, Total (as N)	<0.050		0.050	mg/L		06-MAY-17	R3716709
Orthophosphate-Dissolved (as P)	<0.0050	000	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 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	
` '	0.101		0.000	mg/L		05-101/21-17	
Nitrite in Water by IC							

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

L1920544 CONTD.... PAGE 3 of 5 Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/	Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1920544-4	COLUMBIA RIVER SIDE CHANNEL TEI	MP: 13 PH: 7.8						
Sampled By:	TJ on 02-MAY-17 @ 14:00							
Matrix:	WATER							
Miscellaneo	us Parameters							
Ammonia, To		< 0.050		0.050	mg/L		06-MAY-17	R3716709
	ate-Dissolved (as P)	<0.0050		0.0050	mg/L		03-MAY-17	R3715219
Coliform Bac		4	OCR	1	CFU/100mL		03-MAY-17	R3715179
MPN - E. coli		3	OCR	1	MPN/100mL		03-MAY-17	R3715165
Phosphorus (0.0167		0.0050	mg/L		09-MAY-17	R3717247
Total Suspen		8.0		3.0	mg/L		08-MAY-17	R3717760
	Sum of NO2/NO3							
Nitrate in Wa		0.440		0.000			00 MAY 47	D0745500
Nitrate (as N)		0.110		0.020	mg/L		03-MAY-17	R3715508
Nitrate+Nitri Nitrate and N		0.110		0.050	mg/L		05-MAY-17	
Nitrite in Wa		0.110		0.000	9/ _		OO WILLIAM	
Nitrite (as N)		<0.010		0.010	mg/L		03-MAY-17	R3715508
. ,					-			
		I			1	1		

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

L1920544 CONTD....

Reference Information

PAGE 4 of 5 Version: FINAL

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 9223I

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:	

L1920544 CONTD....

Reference Information

PAGE 5 of 5 Version: FINAL

Test Method References:

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

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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

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

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



Workorder: L1920544

Report Date: 16-MAY-17

Page 1 of 3

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 De	mand		<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 - Feca	ıl		<1		CFU/100mL		1	03-MAY-17
NH3-COL-CL	Water							
Batch R3716709 WG2523631-10 LCS Ammonia, Total (as N)			108.5		%		05.445	06-MAY-17
WG2523631-6 LCS Ammonia, Total (as N)			106.0		%		85-115 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 Ammonia, Total (as N)		L1920544-4	102.6		%		75-125	06-MAY-17
NO2-IC-N-CL	Water							
Batch R3715508 WG2522920-3 DUP Nitrite (as N)		L1920544-4 <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 Nitrate (as N)		L1920544-4 0.110	0.108		mg/L	1.7	20	03-MAY-17
WG2522920-2 LCS								



Workorder: L1920544

Report Date: 16-MAY-17

Page 2 of 3

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		ma/l		2	00 MAN/ 47
Total Suspended Solids		<3.0		mg/L		3	08-MAY-17

Workorder: L1920544 Report Date: 16-MAY-17 Page 3 of 3

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

Sample Parameter Qualifier Definitions:

LCSD Laboratory Control Sample Duplicate

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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



ATTN: Lyudmyla Shvets ALS Laboratory Group 2559 29th St. N.E. Calgary, Alberta Canada T1Y 7B5 Received: Report Date: Version: 2017/05/03, 1200 2017/05/16 FINAL

Test Report

Client: Reference: Billing:

ALS106 1617-0929 L1920544

Doslataret

Senior Verifier



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:

Client Code	Enterococcus (MPN/100mL)
L1920544-1 WWTP EFFLUENT -UV TROUGH	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 Toli Free: 1 800 668 9878 www.alsglobal.com



L1920544-COFC

<u>1</u> of <u>1</u>

Report To		Report Fo	rmat / Distribut	tion		Īs										/aila	bility)	
	Kicking Horse Mountain Resort Utility Corporation	✓ Standard	Other			Re	gular (Standa	rd Turr	around	i Time	s - Bus	iness D	ays)				
Contact:	Travis Jobin	PDF	Excel	Digital	✓ Fax	O Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT												
Address:	1500 Kicking Horse Trail	Email 1:	Email 1: tjobin@kickinghorseresort.com				O Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT											
		Email 2:	pmajer@skircr.	com		O Same Day or Weekend Emergency - Contact ALS to Confirm TAT												
	250-344-8442 Fax:	Email 3:	mskyring@kick	inghorseresort.co	om	Analysis Request Please indicate below Filtered, Preserved or both (F, P, F/P)												
Invoice To	Same as Report ? Yes Vo	Client / Pr	roject Informati			Ple	ase ir	dicate	e belo	w Fill	ered	, Pres	ervec	or b	oth (F	, P, F	/P)	
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Company:	Resorts of the Canadian Rockies	PO / AFE:									-							
Contact:	Patrick Majer	LSD:	LSD:										1				ŀ	
Address:	1505 - 17th Ave SW Calgary AB						•		-									ers
Phone:	Fax:	Quote #:			-]						i					1	tain
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(lab	use only)	Contact:	LS	Sampler:	TJ/MMS								إق	. 2				of (
Sample	Sample Identification		Date	Time		ري ا		4	ස	8	۵	립	Fecal Coliform	Enteracocci	Soli			Number of Containers
#	(This description will appear on the report)		(dd-mmm-yy)	(hh:mm)	Sample Type	BODS	TSS	N-NH4	N-NO3	N-N02	Tota! P	Ortho P	ခြိ	inte	ŭ ui			μη
	WWTP Effluent - UV trough Temp: 12 pH: 6.4	_	MATE	IPM	Water	X	Х	X	Х	х	Х	Х	X	Х	Х			5
	Columbia River Upstream Temp: 13 pH: 7.8		11	7 em	Water		Х	Х	х	Х	Х	х	Х	Х	Х			4
	Columbia River Down stream Temp: 12 pH: 7.8		11	ZPM	Water		Х	Х	х	х	Х	Х	Х	х	Х			4
	Columbia River Side Channel Temp: 13 pH: 7.8		(1	7 PM	Water		Х	Х	Х	Х	Х	х	Х	Х	Х	\dashv		4
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	Also provided on another Excel tab are the ALS location	addresse:	s, phone numbe	ers and sample	container / presi	ervati	on / k	a se Ioldir	yarat 10 tim	e cat e tat	ici id Ne fo	iu. It con	mon	anal	Vees			
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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

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



L1923888 CONTD.... PAGE 2 of 5 Version: FINAL

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			3		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				3			
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	0.040		0.040	m a/I		10 MAY 17	D0740005
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	0.000		0.050	, a. a. /1		40 140 47	D070000
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 Coliform Ractoria Focal	See Attached		4	CEL1/4001		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 NO2, NO3 and Sum of NO2/NO3	21.3		3.0	mg/L		15-MAY-17	R3725370
NO2, NO3 and Sum of NO2/NO3 Nitrate in Water by IC							
Nitrate in water by iC Nitrate (as N)	0.253		0.020	mg/L		10-MAY-17	R3719285
Nitrate+Nitrite	5.255						
Nitrate and Nitrite (as N)	0.253		0.050	mg/L		12-MAY-17	

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

L1923888 CONTD.... PAGE 3 of 5 Version: FINAL

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	OCR	à	0511/4001		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 NO2, NO3 and Sum of NO2/NO3	25.3		3.0	mg/L		15-MAY-17	R3725370
Noz, Nos and Sum of Noz/Nos 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.

L1923888 CONTD.... PAGE 4 of 5

Version: FINAL

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 9223I

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
0 : (0 : 1 ! ! !	

Chain of Custody Numbers:

L1923888 CONTD....

PAGE 5 of 5 Version: FINAL

Reference Information

Test Method References:

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

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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

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

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



Workorder: L1923888

Report Date: 23-MAY-17

Page 1 of 3

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 Der	mand		98.4		%		85-115	10-MAY-17
WG2528441-1 MB Biochemical Oxygen Der	mand		<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	l		<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 WG2527942-14 LCS			98.7		%		80-120	13-MAY-17



Workorder: L1923888

Report Date: 23-MAY-17 Page 2 of 3

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 Orthophosphate-Dissolv	ed (as P)	L1923888-4 <0.0050	<0.0050	RPD-NA	mg/L	N/A	20	10-MAY-17
WG2526533-2 LCS Orthophosphate-Dissolv	red (as P)		99.4		%		80-120	10-MAY-17
WG2526533-1 MB Orthophosphate-Dissolv	red (as P)		<0.0050		mg/L		0.005	10-MAY-17
WG2526533-4 MS Orthophosphate-Dissolv	ed (as P)	L1923888-4	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

Workorder: L1923888 Report Date: 23-MAY-17 Page 3 of 3

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

Sample Parameter Qualifier Definitions:

LCSD Laboratory Control Sample Duplicate

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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



ATTN: Lyudmyla Shvets ALS Laboratory Group 2559 29th St. N.E. Calgary, Alberta Canada T1Y 7B5 Received: Report Date: Version: 2017/05/10, 1115 2017/05/12 FINAL

Test Report

Client: Reference: Billing:

ALS106 1617-0954 L1923888

Opplehavet

Senior Verifier



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

D	es	••1	+.
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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 $41 \pm 1^{\circ}$ 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 anada Toll Free: 1 800 668 9878 www.alsglobal.com

COC#	

Page 1 of

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Address: 1500 Kic	king Horse Trail	Email 1:	tjobin@kickingh	orseresort.com	<u></u>	O Er	nergen	y (1-2	Bus. D	ays) -	100%	Surcha	rge - C	ontact	ALS to (Confirm	TAT
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Phone: 2502344	8442 Fax:	Email 3:	mskyring@kicki	inghorseresort.	<u>com</u>					Α	nalys	is Re	ques	t			
Invoice:To Same as	Report? Yes No	Client / P	roject Informati	on		Ple	ase in	dicate	e belo	w Filt	ered,	, Pres	erved	or b	oth (F,	P, F/F	2)
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Contact: Patrick M	ajer	LSD:		· C					Ī					ŀ		,•	
Address: 1505 - 17	th Ave SW Calgary AB					\ '											le is
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Sample	Sample Identification		Date	Time		2		4	8	8	ے	۳	ဒ္ဓို	200	Coffi		<u>Ş</u>
* # 1875 A	(This description will appear on the report)		(dd-mmm-yy)	(hh:mm)	Sample Type	BODS	TSS	N-N 4	N-NO3	N-NO2	Total P	Ortho P	Fecal Coliform	Enterococci	Ŭ шi		Number of Containers
	ffluent - UV trough Temp: 13 pH: 6,8	<u> </u>	MAY9	ZPM	Water	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х		5
	River Upstream Temp: 9 pH: 7,7	12.	MAY9	3 em	Water		Х	х	Х	Х	Х	Х	Х	Х	Х		4
	River Down stream Temp: 9 pH: 8.0		MAY9	31M	Water		Х	Х	х	Х	Х	Х	Х	Х	Х		4
	River Side Channel Temp: 9 pH: 7, 6	,	MAYA	ZAM	Water		Х	Х	Х	Х	Х	Х	х	Χ	Х		4
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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

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

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



L1951617 CONTD.... PAGE 2 of 3 Version: FINAL

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
	0.7			9/ =		0.002	11070000
				<u> </u>	L	<u> </u>	

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

L1951617 CONTD.... PAGE 3 of 3

Version: FINAL

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 IncubO2 electrode

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

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.



Workorder: L1951617

Report Date: 08-JUL-17

Page 1 of 2

Client:

KICKING HORSE MOUNTAIN UTILITY CORPORATION

1505 - 17th AVENUE SW CALGARY AB T2T 0E2

Contact: TRAVIS JOBIN

WG2563647-2 LCS Biochemical Oxygen Demand 88.2 % 85-115 30-JUN-WG2563647-1 MB Biochemical Oxygen Demand <2.0 mg/L 2 30-JUN-WG256309-2 P-T-COL-CL Water Batch R3767429 WG2565395-2 LCS Phosphorus (P)-Total 106.3 % 80-120 06-JUL-WG2565395-1 MB Phosphorus (P)-Total <0.0050 mg/L 0.005 06-JUL-WG2561340-5 PO4-DO-COL-CL Water Batch R3760144 WG2561340-5 LCS	Test M	atrix Refer	ence Result	Qualifier U	nits RPD	Limit	Analyzed
WG2563647-3 DUP L1951617-1 Biochemical Oxygen Demand <2.0	BOD-BC-CL V	Vater					
Biochemical Oxygen Demand	Batch R3765853						
WG2563647-2 LCS Biochemical Oxygen Demand 88.2 % 85-115 30-JUN-WG2563647-1 MB Biochemical Oxygen Demand <2.0			-				
Biochemical Oxygen Demand 88.2 % 85-115 30-JUN-WG2563647-1 MB Biochemical Oxygen Demand <2.0	, ,	nd <2.0	<2.0	RPD-NA m	ng/L N/A	20	30-JUN-17
Biochemical Oxygen Demand <2.0 mg/L 2 30-JUN-P-T-COL-CL Water		nd	88.2	%	, b	85-115	30-JUN-17
P-T-COL-CL Water Batch R3767429 WG2565395-2 LCS Phosphorus (P)-Total 106.3 % 80-120 06-JUL- WG2565395-1 MB Phosphorus (P)-Total < 0.0050 mg/L 0.005 06-JUL- PO4-DO-COL-CL Water Batch R3760144 WG2561340-5 LCS Orthophosphate-Dissolved (as P) 100.2 % 80-120 01-JUL-							
Batch R3767429 WG2565395-2 LCS Phosphorus (P)-Total 106.3 % 80-120 06-JUL- WG2565395-1 MB Phosphorus (P)-Total < 0.0050 mg/L 0.005 06-JUL- PO4-DO-COL-CL Water Batch R3760144 WG2561340-5 LCS Orthophosphate-Dissolved (as P) 100.2 % 80-120 01-JUL-	Biochemical Oxygen Dema	nd	<2.0	m	ng/L	2	30-JUN-17
WG2565395-2 LCS 106.3 % 80-120 06-JUL-WG2565395-1 MB Phosphorus (P)-Total <0.0050	P-T-COL-CL V	Vater					
Phosphorus (P)-Total 106.3 % 80-120 06-JUL-WG2565395-1 MB Phosphorus (P)-Total <0.0050	Batch R3767429						
WG2565395-1 MB <0.0050 mg/L 0.005 06-JUL- PO4-DO-COL-CL Water Batch R3760144 R3760144 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
Phosphorus (P)-Total < 0.0050 mg/L 0.005 06-JUL- PO4-DO-COL-CL Water Batch R3760144 R37601444 R37601444	Phosphorus (P)-Total		106.3	%	, o	80-120	06-JUL-17
PO4-DO-COL-CL Water Batch R3760144 WG2561340-5 LCS Orthophosphate-Dissolved (as P) 100.2 % 80-120 01-JUL-			0.0050		/I		
Batch R3760144 WG2561340-5 LCS Orthophosphate-Dissolved (as P) 100.2 % 80-120 01-JUL-	Priospriorus (P)-Totai		<0.0050	m	ng/L	0.005	06-JUL-17
WG2561340-5 LCS Orthophosphate-Dissolved (as P) 100.2 % 80-120 01-JUL-	PO4-DO-COL-CL V	Vater					
Orthophosphate-Dissolved (as P) 100.2 % 80-120 01-JUL-	Batch R3760144						
WG2561340-4 MB	Orthophosphate-Dissolved	(as P)	100.2	%	, o	80-120	01-JUL-17
0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		(5)					
Orthophosphate-Dissolved (as P) <0.0050 mg/L 0.005 01-JUL-	Orthophosphate-Dissolved	(as P)	<0.0050	m	ng/L	0.005	01-JUL-17
TSS-CL Water	TSS-CL V	Vater					
Batch R3765569	Batch R3765569						
WG2562426-2 LCS							
Total Suspended Solids 106.0 % 85-115 04-JUL-	Total Suspended Solids		106.0	%	Ó	85-115	04-JUL-17
WG2562426-1 MB							
Total Suspended Solids <3.0 mg/L 3 04-JUL-	Total Suspended Solids		<3.0	m	ng/L	3	04-JUL-17

Workorder: L1951617 Report Date: 08-JUL-17 Page 2 of 2

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

Sample Parameter Qualifier Definitions:

LCSD Laboratory Control Sample Duplicate

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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

ALS) Environmen



L1951617-COFC

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

COC#	

Page <u>1</u> of <u>1</u>

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Company:	Kicking Horse Mou	ntain Water Util	ity Co. Ltd.		☑ Standard	Other			Re	gular (Standa	ard Tur	пагоил	d Times	- Busine	s Days)				
Contact:	Travis Jobin				PDF	Excel	Digital	✓ Fax	O Pri	iority (2	2-4 Bus	iness (Days) -	50% Su	ırcharge ·	Contact	ALS to	Confirm	TAT	
Address:	1500 Kicking Horse	e Trail	-		Email 1:	tjobin@kickingh	orseresort.com		O En	nergen	cy (1-2	Bus. C	ays) -	100% S	urcharge	- Contac	t ALS to	Confir	n TAT	
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hone:	250-344-6003	Fax:	_		Email 3:	mskyring@kicki	nghorseresort.c	<u>om</u>					Α	nalysi	s Requ	est				
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Contact:	Patrick Majer		<u>-</u> -		LSD:]				16	ŀ					1	.
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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

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

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



L1965513 CONTD.... PAGE 2 of 3 Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1965513-1 UV TROUGH							
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.

L1965513 CONTD....

PAGE 3 of 3 Version: FINAL

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 IncubO2 electrode

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

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

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.



Workorder: L1965513

Report Date: 02-AUG-17

Page 1 of 2

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 Der	mand		89.7		%		85-115	27-JUL-17
WG2582874-1 MB Biochemical Oxygen Der	mand		<2.0		mg/L		2	27-JUL-17
FCC-MF-CL	Water							
Batch R3784763 WG2580806-2 DUP Coliform Bacteria - Fecal	I	L1965513-1 9	8		CFU/100mL	12	65	27-JUL-17
WG2580806-1 MB Coliform Bacteria - Feca	I		<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-Dissolve	ed (as P)		107.1		%		80-120	28-JUL-17
WG2580622-1 MB Orthophosphate-Dissolve	ed (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

Workorder: L1965513 Report Date: 02-AUG-17 Page 2 of 2

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



L1965513-COFC

Report To				F	Report Fo	rmat / Distribut	tion		Serv	ice R	eque	<u>.</u>							
Company:	Kicking Horse Mou	ntain Water Utili	ity Co. Ltd.		✓ Standard	Other			● Re	egular (Stand	ard Tur	narour	d Times	- Business	Days)			
Contact:	Travis Jobin				PDF	Excel	Digital	✓ Fax	O Pr	iority (2-4 Bu	siness	Days) -	50% Su	rcharge -	Contact /	ALS to C	onfirm	TAT
Address:	1500 Kicking Horse	e Trail		E	Email 1:	tjobin@kickingh	orseresort.com		O Er	nergen	cy (1-2	2 Bus. I	Days) -	100% Si	urcharge -	Contact	ALS to (Confirm	TAT
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Phone:	250-344-6003	Fax:	_	E	īmail 3:	mskyring@kicki	inghorseresort.c	om -					A	nalysis	s Reque	st			
Invoice To	Same as Report?	Yes	✓ No	C	Client / Pr	roject Information	on		Ple	ase ir	dicat	te bel	ow Fi	tered, F	reserve	ed or b	oth (F,	P, F/I	?)
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Company:	Resorts of the Can	adian Rockies		F	O / AFE:							<u>u</u>							
Contact:	Patrick Majer			L	.SD:							E E							,,
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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

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

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L1983507 CONTD.... PAGE 2 of 3 Version: FINAL

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.

L1983507 CONTD....

Reference Information

PAGE 3 of 3 Version: FINAL

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.

** 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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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Workorder: L1983507

Report Date: 07-SEP-17

Page 1 of 2

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 R38210	001							
WG2609580-2 LC Biochemical Oxyger			94.4		%		85-115	01-SEP-17
WG2609580-1 ME Biochemical Oxyger			<2.0		mg/L		2	01-SEP-17
FCC-MF-CL	Water							
Batch R3816 WG2607153-1 MB Coliform Bacteria - F	3		<1		CFU/100mL		1	30-AUG-17
TSS-CL	Water						·	007.0017
Batch R3820	891							
WG2609818-8 LC Total Suspended Sc	_		92.3		%		85-115	05-SEP-17
WG2609818-7 ME Total Suspended So			<3.0		mg/L		3	05-SEP-17

Workorder: L1983507 Report Date: 07-SEP-17 Page 2 of 2

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.



Travis Jobin

250-344-6003

Patrick Majer

UV trough 🗻

Hardcopy of Invoice with Report?

Lab Work Order #

(lab use only)

Same as Report ?

1500 Kicking Horse Trail

Resorts of the Canadian Rockies

1505 - 17th Ave SW Calgary AB

Kicking Horse Mountain Water Utility Co. Ltd.

Fax:

Fax:

WASTEWATER

Sample Identification

(This description will appear on the report)

☐ Yes

Yes

IJ No

√ No

Report To

Company:

Contact:

Address:

Phone:

Invoice To

Company:

Contact:

Address:

Phone:

Sample

Released by:

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

tjobin@kickinghorseresort.com

mskyring@kickinghorseresort.com

RCR - Kicking Horse Mountain Resort

Sampler:

Time

(hh:mm)

TJ

Sample Type

Water

patta in -inm

Digital

√ Fax

Report Format / Distribution

Client / Project Information

Q33059

Date

(dd-mmm-yy)

LS

Other

Excel

pmajer@skircr.com

Standard

PDF

Email 1:

Email 2:

Email 3:

Job #:

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PO / AFE:

Quote #

Contact:

L1983507-COFC Servic Regular (Standard Turnaround Times - Business Days) O Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT O Emergency (1-2 Bus, Days) - 100% Surcharge - Contact ALS to Confirm TAT O Same Day or Weekend Emergency - Contact ALS to Confirm TAT Analysis Request Please indicate below Filtered, Preserved or both (F, P, F/P) Number of Containers Fecal Coliform Х Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details SHIPMENT VERIFICATION (lab use only) Date: Time: Obsepvations:

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) Time (hh-mm) Received by: Date: Date (dd-mmm-yv) Time: Temperature: Verified by: Yes / No? ÓС MIM 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: 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

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L1994075 CONTD.... PAGE 2 of 5 Version: FINAL

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	0.4.0		0.050			07.050.47	
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
	0.004		0.010	1119/ -		OLI -17	110000000
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	20 021 17	22-SEP-17	R3836571
NO2, NO3 and Sum of NO2/NO3	42.7		5.0	liig/L		22 OLI 17	10000071
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	000	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	05.055 :=	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	0.070		0.020	mg/L		22 OLI - 17	113033033
Nitrate and Nitrite (as N)	0.078		0.050	mg/L		27-SEP-17	
Titiato ana Titito (ao 11)		1 1				I	
Nitrite in Water by IC							

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

L1994075 CONTD.... PAGE 3 of 5 Version: FINAL

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	0.071		0.020	g/ L		22 02: 17	110000000
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.

L1994075 CONTD....

Reference Information

PAGE 4 of 5 Version: FINAL

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 IncubO2 electrode

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

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

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 $0.45\,\mathrm{micron}$ 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:

L1994075 CONTD....

Reference Information

PAGE 5 of 5 Version: FINAL

Test Method References:

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

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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

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

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



Workorder: L1994075

Report Date: 28-SEP-17

Page 1 of 3

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 Der	mand		95.9		%		85-115	20-SEP-17
WG2624639-1 MB Biochemical Oxygen Der	mand		<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 - Feca	I		<1		CFU/100mL		1	20-SEP-17
NH3-F-CL	Water							
Batch R3840495								
WG2627808-10 DUP Ammonia, Total (as N)		L1994075-4 <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 Ammonia, Total (as N)		L1994075-4	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							



Workorder: L1994075

Report Date: 28-SEP-17 Page 2 of 3

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-ED	Water							
Batch R38395	07							
WG2624736-2 LCS	S	KONELAB_TF	•					
Phosphorus (P)-Tota	ıl		98.3		%		80-120	27-SEP-17
WG2624736-9 LCS	S	KONELAB_TF)					
Phosphorus (P)-Tota	ıl		97.4		%		80-120	27-SEP-17
WG2624736-1 MB	1							
Phosphorus (P)-Tota	ıl		<0.020		mg/L		0.02	27-SEP-17
WG2624736-10 MB	l .							
Phosphorus (P)-Tota	ıl		<0.020		mg/L		0.02	27-SEP-17
PO4-DO-COL-CL	Water							
Batch R38337	58							
WG2620669-2 LC	S							
Orthophosphate-Diss	solved (as P)		96.0		%		80-120	20-SEP-17
WG2620669-1 MB	l .							
Orthophosphate-Diss	solved (as P)		<0.0050		mg/L		0.005	20-SEP-17
TSS-CL	Water							
Batch R38365	71							
WG2623335-14 LC	S							
Total Suspended Sol	lids		102.2		%		85-115	22-SEP-17
WG2623335-13 MB								
Total Suspended Sol	lids		<3.0		mg/L		3	22-SEP-17

Workorder: L1994075 Report Date: 28-SEP-17 Page 3 of 3

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

Sample Parameter Qualifier Definitions:

LCSD Laboratory Control Sample Duplicate

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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

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Chain of Custody / Analytical Request Form

ALS Environmental

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



Page _ 1 of

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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

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L1998834 CONTD.... PAGE 2 of 5 Version: FINAL

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.

L1998834 CONTD.... PAGE 3 of 5 Version: FINAL

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	51.44	_	0=11/100		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 NO2, NO3 and Sum of NO2/NO3	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				3			
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.

L1998834 CONTD....

Reference Information

PAGE 4 of 5 Version: FINAL

Sample Parameter Qualifier Key:

Qualifier	Description 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 IncubO2 electrode

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

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:

L1998834 CONTD....

PAGE 5 of 5 Version: FINAL

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Laboratory Definition	Code L	aboratory Location	
VA	Α	LS ENVIRONMENTAL - VA	NCOUVER, BRITISH COLUMBIA, CANADA
CL	А	LS ENVIRONMENTAL - CA	LGARY, 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.



Workorder: L1998834

Report Date: 05-OCT-17

Page 1 of 3

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 Biochemical Oxygen Der	mand	L1998834-1 <2.0	<2.0	RPD-NA	mg/L	N/A	20	28-SEP-17
WG2631175-5 LCS Biochemical Oxygen Der	mand		93.4		%		85-115	28-SEP-17
WG2631175-4 MB Biochemical Oxygen Der	mand		<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
ECC ME CI	Motor							
FCC-MF-CL Batch R3841666 WG2629172-3 MB Coliform Bacteria - Feca	Water		<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								



Workorder: L1998834

Report Date: 05-OCT-17 Page 2 of 3

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-CL Batch R3845027 WG2631170-13 MB Nitrate (as N)	Water		<0.020		mg/L		0.02	28-SEP-17
P-T-PRES-COL-VA	Water							
Batch R3841688 WG2629007-6 CRM Phosphorus (P)-Total		VA-ERA-PO4	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 Phosphorus (P)-Total		VA-ERA-PO4	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 Phosphorus (P)-Total		VA-ERA-PO4	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-Dissolv	red (as P)		113.9		%		80-120	28-SEP-17
WG2627939-1 MB Orthophosphate-Dissolv	red (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

Workorder: L1998834 Report Date: 05-OCT-17 Page 3 of 3

Legend:

CVS

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

Sample Parameter Qualifier Definitions:

Calibration Verification Standard LCSD Laboratory Control Sample Duplicate

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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



Microbial Test Results

Samples collected September 27, 2017

Final Report

October 4, 2017

Submitted to: ALS Environmental

Calgary, AB



SAMPLE INFORMATION

Commis ID/		Dansint		
Sample ID/ — Internal ID	Collected	Received	Enterococcus test initiation	Receipt temperature
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

Cample ID	MPN/100 mL	
Sample ID ———	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

Reference: 1718-0227



QA/QC

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

Report By:

Leila Oosterbroek, BSc Environmental Scientist

Oppleheret

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

Reference: 1718-0227

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

Quanti-Tray Bench Sheet - Enterococcus

	Client AS 1010 Reference 178-0227
Test Initiation Date: 2014/09/25 Time: 12.20 Techician: TM I LO	Reagent Lot#/Expiry: EN\528 V: IR MAYZAR Comments:
Thermometer Serial #: $\frac{10000347}{1000000000000000000000000000000000000$	Quanti Tray 2000 Lot#/Expiry: チレしい(じん)に2020 8
Results - 24 Hour Incubation Date: 2019109129 Time:	: 1220 Technician: HS
Incubator Temp: (must be 41 ± 0.5°C)	Em
# Positive Large Wells: # Ambiguous Large Wells:	45 18
# Positive Small Wells (Tray 2000 only): # Ambiguous Small Wells (Tray 2000 only):	
Most Probable Number at 24 hours: Results - 28 Hour Incubation	-1 1443:0 25.6 13.2 10.9 139.1
Date: Time:	Technician:
Incubator Temp: (must be 41 ± 0.5°C)	Enterococci (Fluorescent)

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

F

Confirmed Positive Small Wells (Tray 2000 only):

Confirmed Positive Large Wells:

Most Probable Number at 28 hours:



APPENDIX B – Chain-of-custody form

CALGARY



Subcontract Request Form

L1998834

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

Please reference on final report and invoice: PO#

#4, 6125-12 STREET SE CALGARY,AB T2H 2K1

				Combain and a						
Please see enclosed 4	l sam	iple(s) in	4	Container(s))					
SAMPLE NUMBER 1718-0227	ANALYTI	CAL REQU	IRED		DATE SAM	IPLED DUE DATE	Priority Flag			
L1998834-1 WWTP EFFLUEI	NT UV				9/27/201	7				
—O (Enterococcus (ENTERO-HQ 1)					:	10/10/2017	140c			
L1998834-2 COLUMBIA RIV	'ER				9/27/201	.7				
-02	Fatarana (FNTFRO HO 1)					10/10/2017				
L1998834-3 COLUMBIA RIV	'ER				9/27/201	7				
-03	Enterococcus (ENTERO-HQ 1)				1400					
L1998834-4 COLUMBIA RIV	ER SIDE				9/27/201	.7				
-04	Enterocoo	cus (ENTER	RO-HQ 1)		:	1400				
Subcontract Info Contact:		John Fo	rbes (40	3) 291-9897						
Analysis and reporting info o	contact:	2559 29	Sonompil STREET	ΓNE						
			RY,AB T1				1.1.1			
Di				291-9897		.Sonompil@als	sglobal.com			
Please email confirmation	n or rece	ipt to:	r	vancy.Sonomp	oil@alsglobal.c		200			
Shipped By:				Date Shipped:		CON	gic			
Received By:				Date Received:		2017/09	1/28 Jane			
/erified By:				Date Verified:		1150	Ux 25			
				Temperature:		Nos	It souls			
Sample Integrity Issues:										



END OF REPORT

S) Environmental

Chain of Custody / Analytical Request 6---- 6



Page	1 of	1

Report To	Report Fo	rınat / Distribut	ion		L19	9883	4-00	JFC				rsis	subjec	te availa	ability)	
Company. Kicking Hors- Mountain Resc:t Utility Corporation	☑ Standard	[] Other			_											
Contact: Travis Jobin	PDF	Excai	Digitat	₹ Fox	O Pra	orit ; (2-	÷ Cusit	ness Da	1V-1 - 5	0% 5ს	rcharge	e - Cont	acı ALS	to Confirm	1 TAT	
Address: 1500 Kicking Horse Trail	Email 1	tjobin@kickingh	orseresort.com		O En	ergency	(1-2 6	Bus. Da	iys) - 19	00 % S	urchary	je - Cor	ilact At	S to Confin	nı TÆi	_
	Email 2	pmajer@skircr.d	com		O Sar	ne D יy	or Wee	ekend B	me.ge	ncy - (ontact	AL5 to	Confirm	TAT		
Phone: 250-344-8442 Fax:	Enrail 3:	mskyring@kicki	nghorseresort.co	<u>m</u>					- —		is Re					
nvoice To Same as Report? 🔲 Yes 🔃 No		oject Informatio			Ple	ase in	dicate	e bele	w Hilb	ered,	Prese	erved	or bot	h (F, P, I	F/F)	- 1
Hardcopy of Invoice with Report? 🔲 Yes 🔃 No	Job #:	Week Z - 20	17 Fall EMS prog	ram - VV\V									_		<u> </u>	-
Company: Resorts of the Canadian Rockies	PO / AFE:					1	ŀ		ļ		Ì			-	1	1
Contact: Patrick Majer	LGD:]		-			1		Ì				
Address: 1505 - 17th Ave SW Calgary AB							l		j		Ī		J,			g l
Phone: Fax:	Quots #.								į	į	l	j	1			Containers
Lab Work Order #	ALS Contact:	LS	Sampler:	TJ/MS						1		Coliform	ν 			er of Co
Sample Sample Identification (This description will appear on the repo	rt)	Date (dd-minn, yy)	Time (hhaem)	Sample Type	BODS	TSS	N-NH4	N-NO3	N-NO2	Total P	Ortho F	Feca' (Enterococc	E. Colf		Number of
WWTP Effluent - UV trough Temp: 16 ph: 6	.9	SEP 27	180	V√ater	Х	Х	Х	Х	X	Х	Х	Х	Х	х		5
	6		3 PM	Water		Х	Х	X	x	X	X	Х	X	х		4
Columbia River Down stream (emp. 12 pl.: 7.	.6		j	Water	i	Х	Х	X	χ	X	X	Х	x	x		4
Columbia River Side Channel Temp: 12 pH. 7	1.2	1	V	Wate:		Х	x	Х	X	Х	Х	X	X	X	T -	4
38 23																
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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

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

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



L2002737 CONTD.... PAGE 2 of 5 Version: FINAL

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)	0.079		0.050	ma/l		22-OCT-17	
` ,	0.078		0.050	mg/L		22-001-17	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		07-OCT-17	R3862642
L2002737-3 COLUMBIA RIVER DOWN STREAM				3-			
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				3-			
Nitrate in Water by IC Nitrate (as N)	0.088		0.020	mg/L		07-OCT-17	R3862642
	0.000		0.020	9, _		3. 33. 17	1.0002042
Nitrate+Nitrite							

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

L2002737 CONTD.... PAGE 3 of 5 Version: FINAL

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			0511/400		05-OCT-17	R3855476
Coliform Bacteria - Fecal	6	000	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 NO2, NO3 and Sum of NO2/NO3	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.

L2002737 CONTD....

Reference Information

PAGE 4 of 5 Version: FINAL

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 IncubO2 electrode

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

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

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

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 $0.45\,\mathrm{micron}$ 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:

L2002737 CONTD....

Reference Information

PAGE 5 of 5 Version: FINAL

Test Method References:

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

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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

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

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



Workorder: L2002737

Report Date: 22-OCT-17

Page 1 of 3

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 Biochemical Oxygen Del	mand	L2002737-1 <2.0	<2.0	RPD-NA	mg/L	N/A	20	07-OCT-17
WG2637613-2 LCS Biochemical Oxygen Der	mand		98.8		%		85-115	07-OCT-17
WG2637613-1 MB Biochemical Oxygen Der	mand		<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 - Feca	I		<1		CFU/100mL		1	05-OCT-17
NH3-F-CL	Water							
Batch R3862719 WG2645726-7 DUP Ammonia, Total (as N)		L2002737-3 <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 Ammonia, Total (as N)		L2002737-3	94.1		%		75-125	22-OCT-17
NO2-IC-N-CL	Water							
Batch R3862642 WG2645672-11 LCS			400.0		0/			
Nitrite (as N) WG2645672-10 MB			102.9		%		90-110	07-OCT-17
Nitrite (as N)			<0.010		mg/L		0.01	07-OCT-17
NO3-IC-N-CL	Water							
WG2645672-11 LCS Nitrate (as N)			101.8		%		90-110	07-OCT-17
WG2645672-10 MB								



Workorder: L2002737

Report Date: 22-OCT-17 Page 2 of 3

				•			9
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 Orthophosphate-Dissolved (as F	L2002737-1 P) 1.14	1.12		mg/L	1.8	20	05-OCT-17
WG2632900-6 LCS Orthophosphate-Dissolved (as F	P)	101.1		%		80-120	05-OCT-17
WG2632900-5 MB Orthophosphate-Dissolved (as F	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

Workorder: L2002737 Report Date: 22-OCT-17 Page 3 of 3

Legend:

ALS Control Limit (Data Quality Objectives)
Duplicate
Relative Percent Difference
Not Available
Laboratory Control Sample
Standard Reference Material
Matrix Spike
Matrix Spike Duplicate
Average Desorption Efficiency
Method Blank
Internal Reference Material
Certified Reference Material
Continuing Calibration Verification
Calibration Verification Standard

Sample Parameter Qualifier Definitions:

LCSD Laboratory Control Sample Duplicate

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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



Microbial Test Results

Samples collected October 04, 2017

Final Report

October 16, 2017

Submitted to: **ALS Environmental**

Calgary, AB



SAMPLE INFORMATION

Comple ID/		Dates		Dessint
Sample ID/ - Internal ID	Collected	Received	Enterococcus test initiation	Receipt temperature
L2002737-1 WWTP EFFLUENT - UV TROUGH/	04-Oct-17 at 1400h	05-Oct-17 at 1230h	05-Oct-17 at 1245h	13.0°C
1718-0284-01				
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/	04-Oct-17 at 1500h	05-Oct-17 at 1230h	05-Oct-17 at 1245h	13.0°C
1718-0284-03				
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

Comple ID	MPN/100 mL	
Sample ID	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

Reference: 1718-0284



Opplalaret

QA/QC

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

Report By:

Harjot Sandhu, BSc

Harjot Sandhu

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

Reference: 1718-0284

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



Quanti-Tray Bench Sheet - Enterococcus

	Client AUSIOG Reference	H820-81t1
Test Initiation Date: $7013/10105$ Time: 1245 Techician: $7w/HS$	Reagent used: Enterolert™ Reagent Lot#/Expiry: AN 150 2016/16 Comments:	i
Thermometer Serial #: はいっつろりまう Incubator #: 子 Incubator Temperature: サ	Quanti Tray 2000 Lot#/Expiry: FL014 7018/06/12	
Results - 24 Hour Incubation Date: 20 3/10/06 Time:	Time: 1245 Technician: HS	
Incubator Temp: 나 (must be 41 ± 0.5°C)		
# Positive Large Wells:	CTL -01 -02 -04	
# Positive Small Wells (Tray 2000 only): # Ambiguous Small Wells (Tray 2000 only): Most Bookship Nices	00 0 3	
Results - 28 Hour Incubation	<1.0 <1.0 sed 2.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1	
Date: Time:	Technician:	
Incubator Temp: (must be 41 ± 0.5°C)	Enterococci (Fluorescent)	

Revised by LO on 2015/07/09 Written by KS on 2006/07/11

Nautilus Environmental (Calgary)

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

Confirmed Positive Small Wells (Tray 2000 only):

Confirmed Positive Large Wells:

Most Probable Number at 28 hours:

F

H

File: ENT



APPENDIX B – Chain-of-custody form



Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

#4, 6125-12 STREET SE CALGARY,AB T2H 2K1

	ol report and invoice: PO# <u>L200</u> 0 be provided with your final results		
Please see enclosed 4 sa	mple(s) in 4 Container(s)		
SAMPLE NUMBER ANALYT	ICAL REQUIRED	DATE SAMPLED DUE DATE	Priority Flag
L2002737-1 WWTP EFFLUENT - UV TROUGH		10/4/2017 2pn	
	ccus (ENTERO-HQ 1)	10/17/2017	, '
L2002737-2 COLUMBIA RIVER UPSTREAM		10/4/2017 3Pr	ζ,
Enteroco	ccus (ENTERO-HQ 1)	10/17/2017	·
L2002737-3 COLUMBIA RIVER DOW STREAM	N	10/4/2017 307	~
	ccus (ENTERO-HQ 1)	10/17/2017	
L2002737-4 COLUMBIA RIVER SIDE CHANNEL		10/4/2017 3/	~
Enteroco	ccus (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 rece	eipt to: Nancy.Sonompi	@alsglobal.com	
Shipped By:	Date Shipped:	<u>Ca</u>	No SII
Received By:	Date Received:	8017/10/05	4 x 250m L
Verified By:	Date Verified:	1230	Ja200
	Temperature:		13°C
Sample Integrity Issues:			



END OF REPORT

ALS) Enuire



Chain of Custody / Analytical Reg test Form Canada Toll Free: 1 800 658 9878 www.alsglobal.com

	COC+

Page	1 of	1

Report To		Report Fo	rmat / Distribut	tion		Servi	ce R	eque:	sted	Push	for rou	itine a	nalysi	s subje	ot to a	vailabi	lit/)
Company:	Kicking Horse Mountain Resort Utility Corporation	☑ Standard	Other			Regular (Standard Turnaround Times - Business Days)											
Contact:	Travis Jobin	rdF	Excel	Digita!	ital Fax Priority (2-4 Business Pays) - 50% Surcharge - Contact ALS to Confirm							ofirm T	4,5				
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickingh	norseresort.com		O im	ergene	cy (1-2	Bi s. D	ays) - i	100% s	ourchar	ga - Co	antact A	LS to C	onfirm 1	<u> </u>
		Email 2.	pmajer@skircr	com		C Sa	me Day	y or Wi	eltend	Emerg	ency -	Corrac	t ALS to	o Confir	m TAT		
Phone:	250-344-8442 Fax:	Email 3:	mskyring@kick	inghorseresort.c	<u>om</u>	i					<u> </u>	sis Ru					
invoice To	Same as Report ? [] Yes . [] No	Client / Pr	roject Informati	on		Ple	ase ii	ndica	e bel	ow Fil	tered	, Pres	ervec	l or bo	th (F.	P, F/I	'
Hardcopy of I	nvoice with Report? 🔲 Yes 💹 No	Job#:	Week - 20	17 Fall EMS pro	gram - WW			ļ						 			
Company:	Resorts of the Canadian Rockies	FO / AFE:				<u> </u>								i			
Contact.	Patrick Majer	LSD:											ļ		į		
Address:	1505 - 17th Ave SV/ Calgary AB								·					,			Je.
Phone:	Fax:	Quote #:] j							l	,	. 1		
	Vcrk Order#	*_ Al∟S *_ Contact:	LS	Sampler:	TJ/MS			ı					oliform	in 8			Number of Confainers
∵Sample 4			Date (dd-mnim-yy)	Time (hhinan)	Sample Type	BOD5	TSS	N-NH4	ECM-N	N-NO2	Total P	Ortho F	Fecal Coliform	Enteroconi	fi. Coli		Nembe
	WWTP Effluent - UV trough Temp: 14 pH: 66		OCT4	ZPM	Water	X	Х	Х	X	Х	Х	Х	Х	х	X		5
17.77			OCTY	304	:Vater		Х	Х	X	Х	Х	χ	X	х	X	1	4
157%		·	OCT4	3PM	Water	j — – j	Х	х	X	Х	X	X	Х	х	Х		4
	Columbia River Side Channel Temp: (() pH: 80		OCTY	3/1	Water	-	×	X		х	х	Х	Х	X	X	\dashv	4
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	Special Instructions / Regulations with water or la	ind use (CCM	1E-Freshwater /	Aquatic Life/BC	CSR - Commerci	al/AB	Tier	1 - Ne	tura:	etc)	/ Haz	arde	ıs De	tails			
	Failure to complete a	Il cortions o	fthic form may	dolay analysis	Please fill in this	form	1.50	SIGN V									
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	Also provided on another Excel tab are the ALS location												mon a	analy:	ses.		
15.00 mg	SHIRNENT RELEASE (client use) > 1															y) 75	44
Released by			Date:	Time:	Temperature:		fied b			Date			Time			Obser	yations:
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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

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

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



L2004966 CONTD.... PAGE 2 of 5 Version: FINAL

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	0.004		0.050			04 007 47	
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
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		0.010	1119/ =		11 301-17	110004201
L2004966-3 COLUMBIA RIVER DOWN STREAM Sampled By: TJ/MS on 10-OCT-17 @ 15:00							
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)	<0.050		0.050	mg/L		11-OCT-17	R3852708
Enterococcus	See Attached		0.0000	IIIg/L		12-OCT-17	R3859988
Coliform Bacteria - Fecal	53		1	CFU/100mL		11-OCT-17	R3853236
MPN - E. coli	19	OCR	1	MPN/100mL		11-0CT-17	R3853236 R3853209
Phosphorus (P)-Total	0.013		0.010	mg/L		13-OCT-17	R3853635
Total Suspended Solids	4.3			_		13-0CT-17	
NO2, NO3 and Sum of NO2/NO3	4.3		3.0	mg/L		17-001-17	R3860081
Noz, Nos and Sum of Noz/Nos Nitrate in Water by IC							
Nitrate in Water by iC Nitrate (as N)	0.093		0.020	mg/L		11-OCT-17	R3864287
Nitrate+Nitrite	0.000		0.020				
Nitrate and Nitrite (as N)	0.093		0.050	mg/L		24-OCT-17	

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

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ALS ENVIRONMENTAL ANALYTICAL REPORT

L2004966-4 COLUMBIA RIVER SIDE CHANNEL Sampled By: TJ/MS on 10-OCT-17 @ 15:00 Matrix: WATER	Batch	Analyzed	Extracted	Units	D.L.	Qualifier*	Result	Sample Details/Parameters
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 R								L 2004966-3 COLUMBIA BIVER DOWN STREAM
Matrix: WATER Nitrite in Water by IC Nitrite (as N) <0.010 0.010 mg/L 11-OCT-17 R L2004966-4 COLUMBIA RIVER SIDE CHANNEL Sampled By: TJ/MS on 10-OCT-17 @ 15:00 TJ/MS on 10-OCT-17 @ 15:00 Matrix: WATER 23-OCT-17 RATER WATER 11-OCT-17 RATER WATER 12-OCT-17 RATER WATER 11-OCT-17 RATER WATER MATER								
Nitrite in Water by IC Nitrite (as N) < 0.010 0.010 mg/L 11-OCT-17 R L2004966-4 COLUMBIA RIVER SIDE CHANNEL Sampled By: TJ/MS on 10-OCT-17 @ 15:00 Sepanded By: TJ/MS on 10-OCT-17 @ 15:00 0.050 0.050 mg/L 23-OCT-17 R 23-OCT-17 R 0.0050 0.0050 mg/L 11-OCT-17 R 11-OCT								
Nitrite (as N)								
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 R O.0050 O.0050 O.0050 mg/L O.0050 O.0050 O.0050 mg/L O.0050 O.0050 O.0050 O.0050 mg/L O.0050 O.0	R3864287	11-OCT-17		mg/L	0.010		<0.010	Nitrite (as N)
Matrix: WATER Miscellaneous Parameters Ammonia, Total (as N) <0.050 0.050 mg/L 23-OCT-17 R Orthophosphate-Dissolved (as P) <0.0050								
Miscellaneous Parameters Ammonia, Total (as N) <0.050 0.050 mg/L 23-OCT-17 R Orthophosphate-Dissolved (as P) <0.0050								
Ammonia, Total (as N) <0.050								
Orthophosphate-Dissolved (as P) <0.0050								
Enterococcus	R3863475							
Coliform Bacteria - Fecal 7	R3852708			mg/L	0.0050			
MPN - E. coli 6 OCR 1 MPN/100mL mg/L mg/L 11-OCT-17 R R Phosphorus (P)-Total 0.017 0.010 mg/L 13-OCT-17 R 13-OCT-17 R R NO2, NO3 and Sum of NO2/NO3 4.3 3.0 mg/L 17-OCT-17 R R Nitrate in Water by IC Nitrate (as N) 0.178 0.020 mg/L 11-OCT-17 R R Nitrate and Nitrite (as N) 0.178 0.050 mg/L 24-OCT-17 R 24-OCT-17 R Nitrite in Water by IC 0.050 mg/L 24-OCT-17 R 0.050 mg/L 0.050 m	R3859988			0511/400				
Phosphorus (P)-Total 0.017 0.010 mg/L 13-OCT-17 R Total Suspended Solids 4.3 3.0 mg/L 17-OCT-17 R NO2, NO3 and Sum of NO2/NO3 Nitrate in Water by IC 0.020 mg/L 11-OCT-17 R Nitrate (as N) 0.178 0.050 mg/L 24-OCT-17 Nitrate and Nitrite (as N) 0.178 0.050 mg/L 24-OCT-17 Nitrite in Water by IC 0.050 mg/L 24-OCT-17	R3853236					000		
Total Suspended Solids 4.3 3.0 mg/L 17-OCT-17 R NO2, NO3 and Sum of NO2/NO3 Nitrate in Water by IC Nitrate (as N) 0.178 0.020 mg/L 11-OCT-17 R Nitrate+Nitrite Nitrate and Nitrite (as N) 0.178 0.050 mg/L 24-OCT-17 Nitrite in Water by IC	R3853209		•			UCR		
NO2, NO3 and Sum of NO2/NO3 0.020 mg/L 11-OCT-17 R Nitrate (as N) 0.178 0.020 mg/L 11-OCT-17 R Nitrate+Nitrite 0.050 mg/L 24-OCT-17 Nitrite in Water by IC 0.050 mg/L 24-OCT-17	R3853635			_				
Nitrate in Water by IC 0.020 mg/L 11-OCT-17 R Nitrate (as N) 0.178 0.050 mg/L 24-OCT-17 R Nitrate and Nitrite (as N) 0.178 0.050 mg/L 24-OCT-17 24-OCT-17 Nitrite in Water by IC 0.050 mg/L 0.050	R3860081	17-OC [-17		mg/L	3.0		4.3	
Nitrate (as N) 0.178 0.020 mg/L 11-OCT-17 R Nitrate+Nitrite 0.050 mg/L 24-OCT-17 Nitrate and Nitrite (as N) 0.050 mg/L 24-OCT-17 Nitrite in Water by IC 0.050 mg/L 0.050								
Nitrate and Nitrite (as N) 0.178 0.050 mg/L 24-OCT-17 Nitrite in Water by IC 24-OCT-17	R3864287	11-OCT-17		mg/L	0.020		0.178	Nitrate (as N)
Nitrite in Water by IC		24 OCT 47		m c /l	0.050		0.470	
		24-001-17		mg/L	0.050		0.178	
	R3864287	11-OCT-17		mg/L	0.010		<0.010	

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

L2004966 CONTD....

Reference Information

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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 IncubO2 electrode

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

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

L2004966 CONTD....

Reference Information

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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.



Workorder: L2004966

Report Date: 24-OCT-17

Page 1 of 3

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 De	mand		100.7		%		85-115	11-OCT-17
WG2640689-4 MB Biochemical Oxygen De	mand		<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 - Feca	ıl		<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 Ammonia, Total (as N)		L2004966-1 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 Ammonia, Total (as N)		L2004966-1	103.4		%		75-125	23-OCT-17
NO2-IC-N-CL	Water							
Batch R3864287								
WG2647054-11 DUP Nitrite (as N)		L2004966-2 <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			-			



Workorder: L2004966

Report Date: 24-OCT-17 Page 2 of 3

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-CL Batch R3864287 WG2647054-12 MS Nitrite (as N)	Water	L2004966-2	112.5		%		75-125	11-OCT-17
NO3-IC-N-CL	Water							
Batch R3864287 WG2647054-11 DUP Nitrate (as N)		L2004966-2 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 Nitrate (as N)		L2004966-2	110.2		%		75-125	11-OCT-17
P-T-COL-WP Batch R3853635	Water							
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-Dissolve	ed (as P)		95.0		%		80-120	11-OCT-17
WG2637111-1 MB Orthophosphate-Dissolve	ed (as P)		<0.0050		mg/L		0.005	11-OCT-17
TSS-CL	Water							
Batch R3860081 WG2641870-6 DUP Total Suspended Solids		L2004966-1 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

Workorder: L2004966 Report Date: 24-OCT-17 Page 3 of 3

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

Sample Parameter Qualifier Definitions:

LCSD Laboratory Control Sample Duplicate

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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



Microbial Test Results

Samples collected October 10, 2017

Final Report

October 19, 2017

Submitted to: ALS Environmental

Calgary, AB



SAMPLE INFORMATION

Carrella ID/		Dates					
Sample ID/ Internal ID	Collected	Received	Enterococcus test initiation	Receipt temperature			
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	
Sample ID	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

Reference: 1718-0311



QA/QC

Reference: 1718-0311

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



Report By:

Harjot Sandhu, BSc

Harjot Saridhu

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

Reference: 1718-0311

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

Quanti-Tray Bench Sheet - Enterococcus

Client 415166 Reference 1318-0311	Date: 2014/10/11 Reagent used: Enterolert** Dilution Factor: Peagent Lot#/Expiry: EN523 2018 05/18 Comments:	90 ミル子ら (must be 41 ± 0.5°C)	4 Hour Incubation Date: こい 3/10/12 Time: (3なの Technician: けン	# Positive Large Wells: # Positive Large Wells: # Positive Large Wells: # Positive Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Confirmed Positive Large Wells: # Confirmed Positive Large Wells: # Confirmed Positive Small Wells Gray 2000 only: # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Small Wells (Tray 2000 only): # Confirmed Positive Small Wells (Tray 2000 only): # Confirmed Positive Small Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Confirmed Positive Wells (Tray 2000 only): # Carry
Test Initiation	ech	Thermometer Serial #: 10 Incubator #: 10 Incubator #: 10 Incubator Temperature: 10 Incubator Tem	Results - 24 Hour Incubation Date: 26	# Positive Large Wells: # Ambiguous Large Wells: # Ambiguous Large Wells: # Positive Small Wells (Tray 2000 only): # Ambiguous Small Wells (Tray 2000 only): # Ambiguous Small Wells (Tray 2000 only): # Ambiguous Small Wells (Tray 2000 only): # Ambiguous Small Wells (Tray 2000 only): # Confirmed Positive Large Wells: # Confirmed Positive Small Wells (Most Probable Number at 28 hour Confirmed positive wells includes the At 28 hours only score marked ambig

SH



APPENDIX B – Chain-of-custody form





Subcontract Request Form

Subcontract To:

NOTES:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

#4, 6125-12 STREET SE CALGARY, AB T2H 2K1

2017/10/11 AP 1100 drappost N 1/S goodam.

Please see enclosed 4 sar	mple(s) in 4 Container(s)	. ,
SAMPLE NUMBER ANALYT	ICAL REQUIRED	DATE SAMPLED Prior DUE DATE Flag
L2004966-1 WWTP EFFLUENT - UV		10/10/2017
	ccus (ENTERO-HQ 1)	10/23/2017 @ 20
L2004966-2 COLUMBIA RIVER		10/10/2017
UPSTREAM Enteroco	ccus (ENTERO-HQ 1)	10/23/2017 @ 3
12004066-2 COLUMBIA BIVED DOW	N	10/10/2017
STREAM Enteroco	ccus (ENTERO-HQ 1)	10/23/2017 @ 3
L2004966-4 COLUMBIA RIVER SIDE		10/10/2017
	ccus (ENTERO-HQ 1)	10/23/2017 € 3
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.co
Please email confirmation of rece	ipt to: Nancy.Sonomp	il@alsglobal.com
Shipped By:	Date Shipped:	
Received By:	Date Received:	
Verified By:	Date Verified:	
	Temperature:	



END OF REPORT

ALS Environmental

Chain of Cristedy / Analytical Rec Canada Toll Free: 1 803 668 www.alsglobal.com



Page ___i_of __1

Report To	Report Format / Distribution											; ai	nalysis	rubje	st to ava	allability ^v	
Company:	Kicking Horse Mountain Resort Utility Corporation	☑ Sti-ndard	Stindard []Other				gular (S	Standa	rd Term	are. nd	Times	- Busi.	ess Da	ys)			
Contact:	Travis Jobin	PDF	PDF				erity (2	-1 Bus	iness Da	Pys)	10% SI	urcharg	e - Con	tact A∟	S to Conf	ire TAT	
Acdress:	1500 Kicking Horse Trail	Emeil 1:	Emeil 1: tjobin@kickinghorseresort.com			C) Em	ergeno	y (1-2	Bus. Da	ıys) 1	00% S	Surchar	ga - Co	ntarit A	LS to Cor	film TAT	
		Email 2:	pmajer@skircr.c	<u>om</u>		Sai	me Day	or We	ekend	imeig:	incy - (Contact	ALS to	Cunfin	n TAT]
Phone:	250-344-8442 Fax;	Email 3:	mskyring@kickir	nghorseresort.co	<u>m</u>					A	naiys	is Re	ques	}			
Invoice To	Same as Report ? Yes 7 No	Client / Pr	oject Informatio	n		Ple	ase in	rdicat	e belo	w Fili	ered,	Pres	erved	or po	th (F, F	, F/P)	
Hardcopy of I	nvoice with Report? 🗍 Yes 🔃 No	Job#	Week 4 - 201	7 Fall EMS prog	tam - MM] [
Сотрану:	Resorts of the Canadian Rockies	FO / AFE:					ĺ							ļ	/		
Contact:	Patrick Majer	İLSD:					ł			ľ				į/	/		
Address:	1505 - 17th Ave SW Calgary AB	<u>L</u>					i			ļ		ļ		- 1	İ		lers
Phone.	Fax ⁻	Quote #:					ĺ							Λħ			fair
Lab V	Vork Order#	ALS Contact:	LS	Sampler:	TJ/MS		j		Ì				oliform	V S			Number of Containers
Sample :	Sample Ide:itification		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BODS	TSS	N-JH4	N-N03	N-NO2	Total	Ortho P	Fecal Colifor	Enteroco	COI		Numbe
	WWTP Effluent - UV frough Temp: (3 pH: 68		OCT 10	291	Water	Х	$\bar{\mathbf{x}}$	Х	Х	Х	Х	Х	Х	X	Х		5
	Columbia River Upstream Temp: 7 pH: 7,8		11	3 PM	Water		х	X	х	х	×	х	x	X	Х		4
	Columbia River Down stream Temp: 7 pH:-1, &		11	3 PM	Water		х	Х	Х	Х	Х	Х	Х	Х	Х		4
	Columbia River Side Channel Femp: 7 pH: 7,8		11	3 PM	Water		Х	Х	Х	Х	х	Х	X	$\overline{\mathbf{x}}$	х		4
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	Special Instructions / Regulations with water or lan-	d use (CCN	iE-Freshwater A	quatic Life/BC 0	SR - Commercia	al/AB	Tier 1	- Na	tural,	etc)	/ Haz	ardou	ıs De	tails			
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 usc)							.1 -	HPME			ICAT					
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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

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

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



L2009703 CONTD.... PAGE 2 of 5 Version: FINAL

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	3.300		0.010	9/ _		10 001 17	.10000-100
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		0.0000	mg/L		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	25-001-17	24-OCT-17	R3866054
NO2, NO3 and Sum of NO2/NO3	15.0		5.0	mg/L		2100111	113000004
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)						10 OCT 17	R3860489
Niliale (as N)	0.102		0.020	mg/L		19-OCT-17	N3000409
Nitrate+Nitrite	0.102		0.020	mg/L		19-001-17	K3000409

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

L2009703 CONTD.... PAGE 3 of 5 Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

	i e			T			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	0.050		0.050	/1		00 OCT 47	D0000740
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			CEL1/4001		20-OCT-17	R3869124
Coliform Bacteria - Fecal	6	OCR	1	CFU/100mL		19-OCT-17	R3861368
MPN - E. coli	5	UCK	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 NO2, NO3 and Sum of NO2/NO3	21.0		3.0	mg/L		24-OCT-17	R3866054
Noz, Nos and Sum of Noz/Nos Nitrate in Water by IC							
Nitrate in Water by iC Nitrate (as N)	0.111		0.020	mg/L		19-OCT-17	R3860489
Nitrate+Nitrite			*****	3			
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.

L2009703 CONTD....

Reference Information

PAGE 4 of 5 Version: FINAL

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

Test Method References:								
ALS Test Code	Matrix	Test Description	Method Reference**					
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode					

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

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

L2009703 CONTD....

Reference Information

PAGE 5 of 5 Version: FINAL

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.



Workorder: L2009703 Report Date: 30-OCT-17 Page 1 of 4

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 De	mand		100.8		%		85-115	20-OCT-17
WG2648612-1 MB Biochemical Oxygen De	mand		<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 - Feca	ıl		<1		CFU/100mL		1	19-OCT-17
WG2644939-3 MB Coliform Bacteria - Feca	ıl		<1		CFU/100mL		1	19-OCT-17
NH3-F-CL	Water							
Batch R3868710 WG2651372-20 DUP Ammonia, Total (as N)		L2009703-1 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 Ammonia, Total (as N)		L2009703-1	N/A	MS-B	%		-	28-OCT-17
NO2-IC-N-CL	Water							
Batch R3860489 WG2644650-7 DUP Nitrite (as N)		L2009703-4 < 0.010	<0.010	RPD-NA	mg/L	N/A	20	19-OCT-17
WG2644650-6 LCS Nitrite (as N)			105.2	<u>2</u>	%	- 4. •	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						



Workorder: L2009703

Report Date: 30-OCT-17

Page 2 of 4

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-CL	Water							
Batch R3860489 WG2644650-8 MS Nitrite (as N)		L2009703-4	113.8		%		75-125	19-OCT-17
NO3-IC-N-CL	Water							
Batch R3860489 WG2644650-7 DUP Nitrate (as N)		L2009703-4 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 Nitrate (as N)		L2009703-4	113.1		%		75-125	19-OCT-17
P-T-COL-ED	Water							
Batch R3865974 WG2646642-11 LCS Phosphorus (P)-Total		KONELAB_TP	93.5		%		80-120	25-OCT-17
WG2646642-2 LCS Phosphorus (P)-Total		KONELAB_TP	95.4		%		80-120	25-OCT-17
WG2646642-9 LCS Phosphorus (P)-Total		KONELAB_TP	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-Dissolv	ved (as P)		100.1		%		80-120	19-OCT-17
WG2643876-3 MB Orthophosphate-Dissolv	ved (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								



Workorder: L2009703 Report Date: 30-OCT-17 Page 3 of 4

Test		Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TSS-CL		Water							
Batch	R3866054								
WG26476	682-1 MB								
Total Su	spended Solids			<3.0		ma/L		3	24-OCT-17

Workorder: L2009703 Report Date: 30-OCT-17 Page 4 of 4

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

Sample Parameter Qualifier Definitions:

LCSD Laboratory Control Sample Duplicate

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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



Microbial Test Results

Samples collected October 18, 2017

Final Report

October 29, 2017

Submitted to: ALS Environmental

Calgary, AB



SAMPLE INFORMATION

Comple ID/		Dates		Danimi
Sample ID/ Internal ID	Collected Received te		Enterococcus test initiation	Receipt temperature
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

Samula ID	MPN/100 mL	
Sample ID ————	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

Reference: 1718-0349



QA/QC

Reference: 1718-0349

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



Blalaret

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

Reference: 1718-0349

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

Quanti-Tray Bench Sheet - Enterococcus

	Client <u>PUSIO6</u> Reference <u> 718 - 0349</u>
Test Initiation Date: 2013/10/19 Time: 1135 Techician: LO/77	Sample Information Sample Information Reagent used: Enterolert™ Dilution Factor: Sample Information Dilution Factor: Reagent Lot#/Expiry: Sample Information Dilution Factor: Reagent Lot#/Expiry: Sample Information Dilution Factor: Reagent Lot#/Expiry: Sample Information Dilution Factor: Comments:
Thermometer Serial #: $I \neq OOO347S$ Incubator #: $\frac{1}{10000000000000000000000000000000000$	Quanti Tray 2000 Lot#/Expiry: 62/10/2020 5 Lot: 62047
Results - 24 Hour Incubation Date: _201子/10/2○ Time:	Time: 1/30 Technician: TM
Incubator Temp: 4 (must be 41 ± 0.5°C)	Enterococci (Fluorescent)
# Positive Large Wells: # Ambiguous Large Wells: # Positive Small Wells (Tray 2000 only): # Ambiguous Small Wells (Tray 2000 only): Most Probable Number at 24 hours:	1 6 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0

						4	
Incubator Iemp: 4 (must be 41 ± 0.5°C)	_				nterococi (Fluorescen	(1)	
	T						
# Confirmed Positive Large Wells:	0	و	01	1)	00		
# Confirmed Positive Small Wells (Tray 2000 only):	0	n	C	10			
Moct Drohable Number of 20 Lanning		2	1		-		
most ribbable Number at 20 nours:	17	5	7	7	24363		l
Confirmed monitive malla instruction of the					10.10		
The state of the s							

Technician:

1530

Time:

Date: 2017/10/20

Results - 28 Hour Incubation

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

Written by KS on 2006/07/11 Revised by LO on 2015/07/09



APPENDIX B – Chain-of-custody form

CALGARY



Subcontract Request Form

L2009703

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

NOTES: Please reference on final report and invoice: PO#

#4, 6125-12 STREET SE CALGARY,AB T2H 2K1

Please see enclosed	4 sam	ıple(s) in	4	Container(s)		
SAMPLE NUMBER	ANALYTI	CAL REQUIRE)		DATE SAMPLED DUE DATE	Priori Flag
L2009703-1 WWTP EFFLUE	ENT - UV				10/18/2017 14:	W
	Enterococo	cus (ENTERO-HO	Q 1)		10/26/2017	
L2009703-2 COLUMBIA RI	VER				10/18/2017 153	N
	Enterococo	cus (ENTERO-HO	Q 1)		10/26/2017	
L2009703-3 COLUMBIA RI	VER DOWN				10/18/2017 534) .
	Enterococo	cus (ENTERO-HO	Q 1)		10/26/2017	
L2009703-4 COLUMBIA RI					10/18/2017 15:	W
	Enterococo	cus (ENTERO-HO	(1)		10/26/2017	
Subcontract Info Contact: Analysis and reporting info	contact:	John Forbes Nancy Sonor 2559 29 STR CALGARY,AE	mpil, REET B T1Y	B. Sc. NE 7B5	Email: Nanay Canavail@	National de la constitución de l
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Jazoo 4x 250 ml good condin

no S/I 10°C



END OF REPORT

ALS Environmental

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



(ALS) Environmental		www.a	isgiobal.com					L:	2009	9703	3-CO	FC			'	'-
Report To	Report Fo	rmat / Distributi	On		Cervic Jity)			·)								
Company: Kicking Horse Mountain Resort Utility Corpora	tion Standard	Other	Other Regular (Srandard Turnaround Times - Business Days)													
Contact: Travis Jobin	□ PDF	☐ PDF ☐ Fxcel ☐ Digital ☐ Fax		_ Fax	O Priority (2-4 Jusiness Days) - 50% Surcharge - Contact ALS to Confirm TAT							1				
Address 1500 Kicking Horse Trail	Email 1:	tjobin@kickingho	orseresort.com		Olem	ergeno	y (1-2	งบร. Da	ys) - 1	.00% 5	suchar	ge - Co	ntact /	NLS to Loi	if!rm TA1	Γ
	Email 2:	pmajer@skircr.c	om		Same Day or Weekend Emergency - Contact ALS to Confirm TAT											
Phone: 250-344-6442 Fax:	Email 3:	mskyring@kickir	nghorseresort.co	<u>om</u>					Α	naiys	sis Re	ques	it			
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Company: Resorts of the Canadian Rockies	PO / AFE:											Ì		İ		
Contact: Patrick Majer	LSD:]								j			
Address: 1505 - 17th Ave SW Calgary AB					.	Ì									ļ	lers
Phone: Fax:	Quote #:]			i					į			Containers
Lab Work Order # (lab use only)	Contact:	Ls	Sampler:	TJ/MS							,	otiform				
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WWTP Effluent - UV trough Temp: []	pH: 8.2 6.8	18-8117	14:00	Water	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х		5
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Columbia River Down stream Temp: 6, 4	pH: 8, 2	15 -0.1 m	12:10.	Water	Ì	X	Х	X	Х	Х	Х	X	Х	Х		4
Columbia River Side Channel Temp: 6 4	pH: 8, 7	[8-04-17		Water		Х	Х	X	Х	X	Χ	Х	Х	Х		4
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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

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

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



L2025715 CONTD.... PAGE 2 of 3 Version: FINAL

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
Trout Bloadsay T assirt all	occ attached.					201101 17	113030007

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

L2025715 CONTD....

PAGE 3 of 3 Version: FINAL

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.



Workorder: L2025715 Report Date: 30-NOV-17 Page 1 of 2

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	
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Workorder: L2025715 Report Date: 30-NOV-17 Page 2 of 2

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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



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:	ת
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
	EPS 1/RM/13, 2nd Ed. Dec. 2000, with 2007 and 2016 amendments, Environment Canada
Reference Method(s):	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 T	itration Solution/10 m	L of Sample x 1000 = 190
Alkalinity (mg/L):	1.5 mL T	itration Solution/ 10 m	1L 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 Me	eter 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)			Dis	Dissolved Oxygen (mg/L)				pH (pH units)						
(/6 V/V)	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					er of F	ish Str	essed	
(% V/V)	0h	24h	48h	72h	96h	24h	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)		er of Fish at f Test	Mean Rate o of Te	
(% V /V)	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

	Observations/Comments
No toxicity observed.	

No sublethal biological effects observed.

ALS Environmental

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



_2025715-COEC

Report To		Report Fo	rmat / Distribut	ion		Servi	ice			L2025/	15-00	FC		5	,
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	✓ Standard	Other			Régular (Standard Turnaround Times									
Contact:	Travis Jobin	PDF	Excel	☐ Digital	✓ Fax	O Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT									
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickingh	orseresort.com		○ En	nergen	cy (1-2	Bus. D	ays) - 100%	6 Surcharge	e - Contact A	LS to Confi	m TAT	
		Email 2:	pmajer@skircr.d	<u>m</u>		○ Sa	me Da	y or W	eekend	Emergency	- Contact A	LS to Confir	m TAT		
Phone:	250-344-6003 Fax:	Email 3:	mskyring@kicki	nghorseresort.c	<u>om</u>					Analy	sis Requ	uest 🦠	_		
Invoice To	Same as Report ? Yes Y No	Client / Pr	oject Informatio	on		Please indicate below Filtered, Preserved or both (th (F, P, I	F/P)				
Hardcopy of I	nvoice with Report? Yes V No	Job #:	RCR - Kicking H	lorse Mountain	Resort										. 1
Company:	Resorts of the Canadian Rockies	PO / AFE:													. 1
Contact:	Patrick Majer	LSD:]]
Address:	1505 - 17th Ave SW Calgary AB]							ļ		lers
Phone:	Fax:	Quote #:	Q33059 — V	1ASTEL	JATER										Number of Containers
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Sample	Sample Identification	•	Date	Time	6	ا پر 1	ابد	ecal Geliform	#	Q					훁
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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

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



L2035816 CONTD.... PAGE 2 of 3 Version: FINAL

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	R3914743
Phosphorus (P)-Total	0.588		0.020	mg/L	18-DEC-17	19-DEC-17	
Total Suspended Solids					10-DEC-17	19-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.

L2035816 CONTD....

PAGE 3 of 3 Version: FINAL

Reference Information

Qualifiers for Individual Samples Listed:

Sample Number	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 IncubO2 electrode				

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

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

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

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

Page 1 of 2

Client:

KICKING HORSE MOUNTAIN UTILITY CORPORATION

1505 - 17th AVENUE SW CALGARY AB T2T 0E2

Contact: TRAVIS JOBIN

Test Matri	x Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL Water Batch R3917152	er						
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	er						
Batch R3914778 WG2685901-2 DUP Coliform Bacteria - Fecal	L2035816-1 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 Wate	er						
Batch R3915799 WG2686674-2 LCS Phosphorus (P)-Total	KONELAB_TF	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	er						
Batch R3914745 WG2685836-3 DUP Orthophosphate-Dissolved (as	L2035816-1 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 Orthophosphate-Dissolved (as	L2035816-1 P)	N/A	MS-B	%		-	16-DEC-17
TSS-CL Wate	er						
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

Workorder: L2035816 Report Date: 21-DEC-17 Page 2 of 2

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 predetermined data quality objectives to provide confidence in the accuracy of associated test results.

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





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

COC#		

Page	1 of	1

Report To	Report Fo	rmat / Distribut	ion		Servi	ce R	eque	sted (Rush	for rou	itine an	alysis su	bject to	availa	bility)	
Company: Kicking Horse Mountain Water Utility Co. Ltd.	☑ Standard	Other	· · · · · · · · · · · · · · · · · · ·		Regular (Standard Turnaround Times - Business Days) Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT											
Contact: Travis Jobin	PDF	Excel	☐ Digital	✓ Fax	O Pri	ority (2	2-4 Bus	iness D	ays) -	50% S	urcharge	- Contac	ALS to	Confirm	TAT	
Address: 1500 Kicking Horse Trail	Email 1:	Email 1: tjobin@kickinghorseresort.com				O Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT										
	Email 2:	pmajer@skircr.c	<u>com</u>		O Sa	me Da	y or We	eekend	Emerg	ency -	Contact :	ALS to Co	nfirm TA	AT		
Phone: 250-344-6003 Fax:	Email 3:	mskyring@kickii	nghorseresort.co	<u>om</u>					A	nalys	is Req	uest				
Invoice To Same as Report ? Yes V No	Client / Pr	roject Informatio	on		Plea	ase in	dicate	e belo	w Filt	ered,	Preser	ved or	both (F	, P, F	/P)	
Hardcopy of Invoice with Report? ☐ Yes ☑ No	Job #:	RCR - Kicking H	lorse Mountain I	Resort												
Company: Resorts of the Canadian Rockies	PO / AFE:				l		İ		ļ							
Contact: Patrick Majer	LSD:				,		1		ļ							
Address: 1505 - 17th Ave SW Calgary AB					1		- 1						ļ			Jers
Phone: Fax:	Quote #:	Q33059											:			ntair
Lab Work Order # (lab use only)	ALS Contact:	LS	Sampler:	TJ		ļ	Coliform		ته	OKTHO P						Number of Containers
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BROKER'S CLIENT ID:				COMPANIES AFF	ORDING COVERAGE							
INSURED'S FULL NAME AND MAILIN	G ADI	ORESS	COMPANY A	Aviva Insuran	ce							
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#140, 5050 - 106 Ave. SE			COMPANY C	Encon Group	Inc.		_					
Calgary, AB T2C 5E9			COMPANY D	-								
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This is to certify that the policies of insurance condition of any contract or other document		spect to which this certi to all the terms	ficate may be issued or , exclusions and condit	r may pertain. The insurance	ce afforded by the policies de							
TYPE OF INSURANCE	OF INSURANCE CO LTR POLICY NUMBER POLICY EFFECTIVE DATE (MM/DD/YY) DATE (MM/DD/YY) LIMITS OF LIABILITY											
COMMERCIAL GENERAL LIABILITY	Α	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					

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COMMERCIAL GENERAL LIABILITY	Α	81229768	3/30/2	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		
POLLUTION LIABILITY EXTENSION CONTRACTUAL LIABILITY						LIABILITY EXTENSION	\$	
AUTOMOBILE LIABILITY						(Per Occurrence/Aggregate) BODILY INJURY PROPERTY	>	
✓ DESCRIBED AUTOMOBILES	A	6141184202	9/18/2	2017	9/18/2018	DAMAGE COMBINED	4	2,000,000
ALL OWNED AUTOMOBILES	``	0111101202	3, 10, 2		3,10,2010	BODILY INJURY (Per Person)	s s	2,000,000
LEASED AUTOMOBILES						BODILY INJURY (Per Accident)	\$	
Γ						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)								
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Z ENVIRONMENTAL CONCULTING								
ENVIRONMENTAL CONSULTING PROFESSIONAL (ERRORS AND OMISSIONS)								
LIABILITY (Claims Made)	l c	SRD485996	4/20/2	2017	4/20/2018	LIMIT/AGGREGATE	\$	2,000,000
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= ENVIRONMENTAL IMPAIRMENT LIABILITY								
(Claims Made)	В	EILT2093	4/1/2	018	4/1/2019	Each Claim	\$	1,000,000
						Aggregate for Each		
						Policy Period	\$	1,000,000
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					28-0231	esiver@toolepeet.co	<u>m</u>	
PRINT NAME INCLUDING POSITION HELD				COMPAN		DATE		
Erica Siver, Account Mana	ger			Toole Pe	eet & Co. Limited	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:
 - Engineering and project management
 - Thousands of environmental site assessments for oil & gas facilities, commercial and industrial sites & multi-residential site
 - Hundreds of Remediation and Risk Management Plans for various projects such as oil & gas leases, batteries, gas plants, underground and aboveground storage tanks sites, chemical storage sites, sites on and adjacent to landfills, CPR yards, chemical storage sites, dry-cleaning and other facilities
 - o Specifications, budget proposals, cost estimates for hundreds of site abandonments projects including equipment dismantling, disposal, re-use, recycling
 - Remediation and risk management options for a number of soil and groundwater treatment methods including off-site disposal and treatment, in-situ treatments ie land treatment, bio-piling, enhanced bio-remediation, chemical in-situ treatment, chemical oxidation and reduction, vapour extraction, pump and treat, etc. as well as other site specific treatment methods
 - Numerous soil and groundwater remediation projects employing various remediation methods for salt, hydrocarbons, solvents, fertilizers, herbicides/pesticides, heavy metals and others
 - Completed numerous remediation projects within the proposed budget cost

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

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

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

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

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

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.