



2018 SEWAGE TREATMENT PLANT ANNUAL REPORT

KICKING HORSE MOUNTAIN RESORT

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 2018.

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, multifamily, 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 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. 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 is now disposed of at the Crowsnest/Pincher Creek Landfill site.

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:

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

2.2 REGISTRATION LETTER OPERATING CONDITIONS

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

Table 1

Effluent Limits

Parameter	Limit	Unit
Flow	300	m³/d
BOD₅	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 Crowsnest/Pincher Creek Landfill site.

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

2.3 REPORTING REQUIREMENTS

An annual report demonstrating the performance of the facility is to be publicly posted on the Internet within 120 days of the end of the calendar year.

In addition the report must also include the following:

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

2.4 SAMPLING FREQUENCY

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

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

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

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

Table 2

Sampling Location/Frequency/Type

	Location									
Parameter	ColumbiaColumbiaColumbiaRiverColumbiad/s of islandRiverRiver ~200 d/sfrom westUpstream atof outfall fromshore ~1km d/sBridgeeast shoreof outfall		Columbia River side channel 3-350m d/s of outfall	Effluent						
EMS Number	E256694	E258898	E258899	E258897	E256696					
	Winter/Summer	Winter/Summer	Winter	Summer	Winter/Summer					
рН	WS/G	WS/G	WS/G	WS/G	W					
Temp	WS/G	WS/G	WS/G	WS/G	W					
Flow	/	/	/	/	W					
BOD ₅	/	/	/	/	W					
TSS	WS/G	WS/G	WS/G	WS/G	WS/G+Q/G					
NH ₃ -N	WS/G	WS/G	WS/G	WS/G	WS/G					
NO ₃ -N	WS/G	WS/G	WS/G	WS/G	WS/G					
NO ₂ -N	WS/G	WS/G	WS/G	WS/G	WS/G					
Total-P	WS/G	WS/G	WS/G	WS/G	WS/G					
Ortho-P	WS/G	WS/G	WS/G	WS/G	WS/G					
Fecal Coliform	WS/G	WS/G	WS/G	WS/G	WS/G+Q/G					
Enterococci	WS/G	WS/G	WS/G	WS/G	WS/G					
E. Coli	WS/G	WS/G	WS/G	WS/G	WS/G					
Toxicity Bioassay	/	/	/	/	1/3Y/G					
Coordinates	11.500456 5684421	11.500288 5684880	N51 19.364 W 11700.218	11.500126 5684835	At sewage treatment plant					

Where:

WS

Q W

G

Weekly seasonal (weekly samples for a period of 5 weeks)

Quarterly

Weekly

Grab

1/3Y Once every 3 years

3.0 SEWAGE FLOW RECORDS

This section provides data and analysis regarding plant effluent flows, and compares 2018 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.

The total effluent flow recorded for 2018 was 45,147 m³ with an average of 123.8 m³/day. Available monthly total effluent flow meter records for 2018 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 2018 was 150.2 m³/day compared to 100.96 m³/day over the same period in 2017, 65.52 m³/day 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 262 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 244 m³/day in 2017, 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 2018 is provided in Table 3 and Figures 2 and 3:

X	Sewage Fl	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
2018	45,147	123.8	262	0

2009 – 2018 Flow Comparisons

Table 3

*not including all of September, October, November or December

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

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

² The SCADA failed to record flow for the entire day on several occasions; therefore flow was estimated on partial data

³ The SCADA failed to record correct flow from July 24th until September 7th; therefore flow was based on partial estimates

2009 - 2017

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 2^{nd} 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.

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.

2018

Peak flows in 2018 coincided with the peak season in January, February, March and December. There were no daily flow limit exceedances observed in 2018. The highest daily flow was recorded on December 31st at 262 m³/day.

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 2018.



Figure 2

Average and Peak Sewage Effluent Flow Comparison Graph



Total Sewage Effluent Flow Graph:



Figure 4



This year, the total effluent discharged was equal to 51.1% 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



2018 Water Consumption and Sewage Effluent Generation

2018 Sewage Effluent Average and Peak Flows by Month

4.0 SEWAGE FLOW PROJECTION

This section shows projected wastewater flow for 2011 through 2018 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 six years (2012, 2013, 2014, 2015, 2016 and 2017) 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, 2016 and 2017 the correction factors were 0.44, 0.22, 0.23, 0.21, 0.24, 0.26 and 0.27 respectively. The correction factor was 0.29 in 2018.

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, 2018 and 2019 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 2018 flow data, the plant has an unused capacity of 38 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 2019 and further considered when adding additional development.

	2011	2012	2013	2014
Estimated Wastewater Flow (m³/day)	705.5*	705.5*	705.5*	705.5
Actual and Corrected (m ³ /day)	312** (a)	159 (a)	165 (a)	146 (a)
	2015	2016	2017	2018
Estimated Wastewater Flow (m³/day)	705.5	705.5	705.5	705.5
Actual and Corrected (m ³ /dav)	167 (a)	162 (a)	244 (a)	262 (a)

Table 4
Projected Peak Flows: 2011-2019

*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

	2019
Estimated Wastewater Flow (m³/day)	705.5
Actual and Corrected (m³/day)	204.6 (b)

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

2011	correction factor of	312*/705.5	= 0.44
2012	**	159/705.5	= 0.22
2013	**	165/705.5	= 0.23
2014	33	146/705.5	= 0.21
2015	"	167/705.5	= 0.24
2016	"	162/705.5	= 0.23
2017	**	244/705.5	= 0.34
2017	"	262/705.5	= 0.37
			- 0 20
	AVERAGE		= 0.29

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

Figure 6





Month

5.0 OVERVIEW OF COLUMBIA RIVER SAMPLE RESULTS

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

Table 5 provides a summary record of the Columbia River test results for the period April 19th, 2018 to October 30th, 2018.

Elevated fecal coliforms and E.Coli were observed in the side stream samples on April 25th, May 3rd, 9th and 16th. Elevated results were also observed in the up-stream and down-stream samples. The levels of coliforms in the effluent on the same days were at or below laboratory detection limits. Elevated levels of Enterococci were observed in the side stream samples on April 25th. May 9th and May 16th. The levels of Enterococci were very low in the effluent on the same day.

The levels of TSS were very elevated in the up-stream and down-stream samples on May 9th and May 16th and moderate levels were found in the side stream on the same dates. The TSS results in the effluent were near or below laboratory detection limits on the same days.

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

2018	Columbia	River	Sample	Results
2010	Columbia	111101	Cumpio	rtoounto

Sample Date	e NH ₃			Ortho-P			Fecal Coliform			E.Coli			Total P mg/L		
yyyy/mm/dd	UP	SIDE	DN	UP	SIDE	DN	UP	SIDE	DN	UP	SIDE	DN	UP	SIDE	DN
2018-04-19	0.050	0.050	0.050	0.010	0.010	0.010	1	2	1	1	2	1	0.020	0.020	0.020
2018-04-25	0.050	0.050	0.050	0.027	0.010	0.010	83	37	31	36	26	6	0.020	0.020	0.020
2018-05-03	0.050	0.050	0.050	0.010	0.010	0.010	36	40	27	27	24	8	0.020	0.020	0.020
2018-05-09	0.050	0.050	0.050	0.010	0.010	0.010	11	41	13	10	16	2	0.061	0.044	0.094
2018-05-16	0.050	0.050	0.050	0.010	0.010	0.010	11	136	12	5	70	11	0.076	0.047	0.137
2018-10-04	0.050	0.050	0.050	0.005	0.008	0.005	8	6	2	2	5	1	0.588	0.016	0.005
2018-10-10	0.050	0.050	0.050	0.005	0.005	0.009	1	1	2	1	1	1	0.005	0.007	0.017
2018-10-16	0.050	0.050	0.050	0.005	0.005	0.005	2	1	1	2	1	1	0.005	0.005	0.005
2018-10-23	0.050	0.050	0.050	0.005	0.005	0.005	1	2	1	1	1	1	0.008	0.009	0.006
2018-10-30	0.050	0.050	0.050	0.005	0.005	0.005	1	1	2	1	1	2	0.005	0.005	0.011
# Samples	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Average	0.050	0.050	0.050	0.01	0.01	0.01	16	27	9	9	15	3	0.08	0.02	0.03
Maximum	0.050	0.050	0.050	0.03	0.01	0.01	83	136	31	36	70	11	0.59	0.05	0.14
Minimum	0.050	0.050	0.050	0.01	0.01	0.01	1.0	1.0	1.0	1.0	1.0	1.0	0.01	0.01	0.01
	Field pH						-							-	
Sample Date		Field pH			TSS			N-NO ₃			N-NO ₂		Ei	nterococ	ci
Sample Date yyyy/mm/dd	UP	Field pH SIDE	DN	UP	TSS SIDE	DN	UP	N-NO ₃ SIDE	DN	UP	N-NO ₂ SIDE	DN	Ei UP	nterococ SIDE	ci DN
Sample Date yyyy/mm/dd 2018-04-19	UP 7.8	Field pH SIDE 7.8	DN 7.8	UP 18.0	TSS SIDE 10.7	DN 12.0	UP 0.13	N-NO ₃ SIDE 0.13	DN 0.12	UP 0.010	N-NO ₂ SIDE 0.010	DN 0.010	UP 2.0	SIDE	DN 1.0
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25	UP 7.8 7.8	Field pH SIDE 7.8 7.8	DN 7.8 7.8	UP 18.0 17.3	TSS SIDE 10.7 14.7	DN 12.0 24.0	UP 0.13 0.11	N-NO ₃ SIDE 0.13 0.09	DN 0.12 0.11	UP 0.010 0.010	N-NO ₂ SIDE 0.010 0.010	DN 0.010 0.010	Er UP 2.0 16.8	SIDE 2.0 9.4	DN 1.0 7.2
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25 2018-05-03	UP 7.8 7.8 7.8	Field pH SIDE 7.8 7.8 7.8	DN 7.8 7.8 7.8	UP 18.0 17.3 24.0	TSS SIDE 10.7 14.7 3.0	DN 12.0 24.0 22.7	UP 0.13 0.11 0.18	N-NO ₃ SIDE 0.13 0.09 0.15	DN 0.12 0.11 0.19	UP 0.010 0.010 0.010	N-NO ₂ SIDE 0.010 0.010 0.010	DN 0.010 0.010 0.010	Er UP 2.0 16.8 5.2	SIDE 2.0 9.4 4.1	DN 1.0 7.2 4.1
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25 2018-05-03 2018-05-09	UP 7.8 7.8 7.8 7.8 7.8	Field pH SIDE 7.8 7.8 7.8 7.8 7.8	DN 7.8 7.8 7.8 7.8 7.8	UP 18.0 17.3 24.0 120.0	TSS SIDE 10.7 14.7 3.0 81.7	DN 12.0 24.0 22.7 214.0	UP 0.13 0.11 0.18 0.22	N-NO ₃ SIDE 0.13 0.09 0.15 0.22	DN 0.12 0.11 0.19 0.24	UP 0.010 0.010 0.010 0.010	N-NO ₂ SIDE 0.010 0.010 0.010 0.010	DN 0.010 0.010 0.010 0.010	Er UP 2.0 16.8 5.2 3.0	SIDE 2.0 9.4 4.1 9.7	DN 1.0 7.2 4.1 4.1
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25 2018-05-03 2018-05-09 2018-05-16	UP 7.8 7.8 7.8 7.8 7.8 7.8	Field pH SIDE 7.8 7.8 7.8 7.8 7.8 7.8 7.8	DN 7.8 7.8 7.8 7.8 7.8 7.8	UP 18.0 17.3 24.0 120.0 149.0	TSS SIDE 10.7 14.7 3.0 81.7 68.7	DN 12.0 24.0 22.7 214.0 281.0	UP 0.13 0.11 0.18 0.22 0.13	N-NO ₃ SIDE 0.13 0.09 0.15 0.22 0.11	DN 0.12 0.11 0.19 0.24 0.15	UP 0.010 0.010 0.010 0.010 0.010	N-NO₂ SIDE 0.010 0.010 0.010 0.010 0.010 0.010	DN 0.010 0.010 0.010 0.010 0.010	Er UP 2.0 16.8 5.2 3.0 4.1	SIDE 2.0 9.4 4.1 9.7 10.9	DN 1.0 7.2 4.1 2.0
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25 2018-05-03 2018-05-09 2018-05-16 2018-10-04	UP 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8	Field pH SIDE 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8	DN 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8	UP 18.0 17.3 24.0 120.0 149.0 6.0	TSS SIDE 10.7 14.7 3.0 81.7 68.7 6.0	DN 12.0 24.0 22.7 214.0 281.0 5.3	UP 0.13 0.11 0.18 0.22 0.13 0.09	N-NO ₃ SIDE 0.13 0.09 0.15 0.22 0.11 0.08	DN 0.12 0.11 0.19 0.24 0.15 0.10	UP 0.010 0.010 0.010 0.010 0.010 0.010	N-NO₂ SIDE 0.010 0.010 0.010 0.010 0.010 0.010 0.010	DN 0.010 0.010 0.010 0.010 0.010 0.010	Er UP 2.0 16.8 5.2 3.0 4.1 1.0	SIDE 2.0 9.4 4.1 9.7 10.9 5.2	DN 1.0 7.2 4.1 2.0 1.0
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25 2018-05-03 2018-05-09 2018-05-16 2018-10-04 2018-10-10	UP 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 8.0	Field pH SIDE 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 6.8	DN 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8	UP 18.0 17.3 24.0 120.0 149.0 6.0 4.7	TSS SIDE 10.7 14.7 3.0 81.7 68.7 6.0 6.0	DN 12.0 24.0 22.7 214.0 281.0 5.3 42.7	UP 0.13 0.11 0.18 0.22 0.13 0.09 0.09	N-NO ₃ SIDE 0.13 0.09 0.15 0.22 0.11 0.08 0.10	DN 0.12 0.11 0.19 0.24 0.15 0.10 0.11	UP 0.010 0.010 0.010 0.010 0.010 0.010 0.010	N-NO ₂ SIDE 0.010 0.010 0.010 0.010 0.010 0.010 0.010	DN 0.010 0.010 0.010 0.010 0.010 0.010 0.010	Er UP 2.0 16.8 5.2 3.0 4.1 1.0 1.0	SIDE 2.0 9.4 4.1 9.7 10.9 5.2 1.0	DN 1.0 7.2 4.1 2.0 1.0
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25 2018-05-03 2018-05-09 2018-05-16 2018-10-04 2018-10-10	UP 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 8.0 7.8	Field pH SIDE 7.8 7.8 7.8 7.8 7.8 7.8 7.8 6.8 7.8 7.8	DN 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8	UP 18.0 17.3 24.0 120.0 149.0 6.0 4.7 3.3	TSS SIDE 10.7 14.7 3.0 81.7 68.7 6.0 6.0 3.0	DN 12.0 24.0 22.7 214.0 281.0 5.3 42.7 6.7	UP 0.13 0.11 0.18 0.22 0.13 0.09 0.09 0.09	N-NO ₃ SIDE 0.13 0.09 0.15 0.22 0.11 0.08 0.10 0.09	DN 0.12 0.11 0.19 0.24 0.15 0.10 0.11 0.10	UP 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	N-NO ₂ SIDE 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	DN 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	Er UP 2.0 16.8 5.2 3.0 4.1 1.0 1.0 1.0	SIDE 2.0 9.4 4.1 9.7 10.9 5.2 1.0 4.1	DN 1.0 7.2 4.1 2.0 1.0 2.0 2.0
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25 2018-05-03 2018-05-03 2018-05-16 2018-10-04 2018-10-10 2018-10-16 2018-10-23	UP 7.8 7.8 7.8 7.8 7.8 7.8 7.8 8.0 7.8 7.8 7.8	Field pH SIDE 7.8 7.8 7.8 7.8 7.8 7.8 7.8 6.8 7.8 6.8 7.8 7.8 7.8	DN 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8	UP 18.0 17.3 24.0 120.0 149.0 6.0 4.7 3.3 4.7	TSS SIDE 10.7 14.7 3.0 81.7 68.7 6.0 3.0 3.0	DN 12.0 24.0 22.7 214.0 281.0 5.3 42.7 6.7 3.0	UP 0.13 0.11 0.18 0.22 0.13 0.09 0.09 0.09 0.09 0.10	N-NO ₃ SIDE 0.13 0.09 0.15 0.22 0.11 0.08 0.10 0.09 0.10	DN 0.12 0.11 0.19 0.24 0.15 0.10 0.11 0.10 0.11	UP 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	N-NO₂ SIDE 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	DN 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	En UP 2.0 16.8 5.2 3.0 4.1 1.0 1.0 1.0 1.0	SIDE 2.0 9.4 4.1 9.7 10.9 5.2 1.0 4.1	DN 1.0 7.2 4.1 4.1 2.0 1.0 2.0 1.0 1.0
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25 2018-05-03 2018-05-03 2018-05-06 2018-10-10 2018-10-10 2018-10-23 2018-10-30	UP 7.8 7.8 7.8 7.8 7.8 7.8 7.8 8.0 7.8 7.8 7.8 7.8 7.8	Field pH SIDE 7.8 7.8 7.8 7.8 7.8 7.8 7.8 6.8 7.8 7.8 7.8 7.8 7.8	DN 7.8	UP 18.0 17.3 24.0 120.0 149.0 6.0 4.7 3.3 4.7 3.0	TSS SIDE 10.7 14.7 3.0 81.7 68.7 6.0 3.0 3.0 3.0	DN 12.0 24.0 22.7 214.0 281.0 5.3 42.7 6.7 3.0 3.0	UP 0.13 0.11 0.18 0.22 0.13 0.09 0.09 0.09 0.09 0.10 0.09	N-NO3 SIDE 0.13 0.09 0.15 0.22 0.11 0.08 0.10 0.09 0.10 0.09	DN 0.12 0.11 0.19 0.24 0.15 0.10 0.11 0.10 0.11 0.10	UP 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	N-NO2 SIDE 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	DN 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	E UP 2.0 16.8 5.2 3.0 4.1 1.0 1.0 1.0 1.0 1.0	SIDE 2.0 9.4 4.1 9.7 10.9 5.2 1.0 4.1	DN 1.0 7.2 4.1 4.1 2.0 1.0 2.0 1.0 1.0
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25 2018-05-03 2018-05-09 2018-05-16 2018-10-04 2018-10-10 2018-10-16 2018-10-23 2018-10-30 # Samples	UP 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8	Field pH SIDE 7.8 7.8 7.8 7.8 7.8 7.8 7.8 6.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 10	DN 7.8	UP 18.0 17.3 24.0 120.0 149.0 6.0 4.7 3.3 4.7 3.0 10	TSS SIDE 10.7 14.7 3.0 81.7 68.7 6.0 3.0 3.0 3.0 3.0 10.7	DN 12.0 24.0 22.7 214.0 281.0 5.3 42.7 6.7 3.0 3.0 10	UP 0.13 0.11 0.18 0.22 0.13 0.09 0.09 0.09 0.09 0.10 0.09 10	N-NO3 SIDE 0.13 0.09 0.15 0.22 0.11 0.08 0.10 0.09 0.10 0.09 0.10	DN 0.12 0.11 0.19 0.24 0.15 0.10 0.11 0.10 0.11 0.10 0.11 0.10	UP 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 10	N-NO2 SIDE 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	DN 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 10	EI UP 2.0 16.8 5.2 3.0 4.1 1.0 1.0 1.0 1.0 1.0 1.0	SIDE 2.0 9.4 4.1 9.7 10.9 5.2 1.0 4.1 1.0 1.0 1.0	DN 1.0 7.2 4.1 4.1 2.0 1.0 2.0 1.0 1.0 1.0
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25 2018-05-03 2018-05-09 2018-05-16 2018-10-40 2018-10-10 2018-10-23 2018-10-30 # Samples Average	UP 7.8 7.8 7.8 7.8 7.8 7.8 7.8 8.0 7.8 7.8 7.8 7.8 7.8 7.8 10 7.8	Field pH SIDE 7.8 7.8 7.8 7.8 7.8 7.8 7.8 6.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7	DN 7.8	UP 18.0 17.3 24.0 120.0 149.0 6.0 4.7 3.3 4.7 3.0 10 35.0	TSS SIDE 10.7 14.7 3.0 81.7 68.7 6.0 3.0 3.0 3.0 3.0 10 20.0	DN 12.0 24.0 22.7 214.0 281.0 5.3 42.7 6.7 3.0 3.0 3.0 61.4	UP 0.13 0.11 0.18 0.22 0.13 0.09 0.09 0.09 0.09 0.10 0.09 10 0.12	N-NO3 SIDE 0.13 0.09 0.15 0.22 0.11 0.08 0.10 0.09 0.10 0.09 0.10 0.09 0.10 0.09 0.10	DN 0.12 0.11 0.19 0.24 0.15 0.10 0.11 0.10 0.11 0.10 10 0.13	UP 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	N-NO2 SIDE 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	DN 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	Et UP 2.0 16.8 5.2 3.0 4.1 1.0 1.0 1.0 1.0 1.0 4	SIDE 2.0 9.4 4.1 9.7 10.9 5.2 1.0 4.1 1.0 5.2 1.0 5.5	DN 1.0 7.2 4.1 2.0 1.0 2.0 1.0 2.0 1.0 3
Sample Date yyyy/mm/dd 2018-04-19 2018-04-25 2018-05-03 2018-05-09 2018-05-16 2018-10-04 2018-10-10 2018-10-16 2018-10-30 # Samples Average Maximum	UP 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8	Field pH SIDE 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8	DN 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8	UP 18.0 17.3 24.0 120.0 149.0 6.0 4.7 3.3 4.7 3.0 10 35.0 149.0	TSS SIDE 10.7 14.7 3.0 81.7 68.7 6.0 3.0 3.0 3.0 3.0 10 20.0 81.7	DN 12.0 24.0 22.7 214.0 281.0 5.3 42.7 6.7 3.0 3.0 3.0 61.4 281.0	UP 0.13 0.11 0.22 0.13 0.09 0.09 0.09 0.09 0.10 0.09 10 0.12 0.22	N-NO3 SIDE 0.13 0.09 0.15 0.22 0.11 0.08 0.10 0.09 0.10 0.09 0.10 0.09 0.10 0.09 0.10 0.09 10 0.12 0.22	DN 0.12 0.11 0.19 0.24 0.15 0.10 0.11 0.11 0.11 0.10 0.13 0.24	UP 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010	N-NO2 SIDE 0.010	DN 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.010 0.01	Et UP 2.0 16.8 5.2 3.0 4.1 1.0 1.0 1.0 1.0 1.0 4 17	SIDE 2.0 9.4 4.1 9.7 10.9 5.2 1.0 4.1 1.0 5.2 1.0 4.1	DN 1.0 7.2 4.1 2.0 1.0 2.0 1.0 2.0 1.0 3 7

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 2018.

A total of 19 effluent samples were collected and analyzed. Table 6 summarizes effluent test results for 2018.

Table 6

Dete	2018 Effluent Results Summary												
Date	Flow	Temp	pН	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
2018-01-02	232	-	-	-	34.0	-	-	-	-	38.0	-	-	-
2018-01-16	147	-3.0	-	-	5.8	0.050	11	-	0.534	5.3	-	-	-
2018-02-28	179	-11.0	-	-	17.0	0.575	2100	-	1.620	44.4	-	-	-
2018-03-15	163	-4.0	-	-	3.9	0.932	49	-	1.050	5.3	-	-	-
2018-04-19	110	-2.0	8.2	0.05	2.0	0.302	1	1	0.368	3.0	12	0.039	1.0
2018-04-25	95	2.0	6.8	0.05	2.0	0.238	1	1	0.351	4.7	8.57	0.027	1.0
2018-05-03	111	3.0	6.8	0.05	3.9	0.100	1	1	-	12.0	7.8	0.024	1.0
2018-05-09	136	7.0	6.8	0.05	2.0	0.052	1	1	0.124	6.3	6.0	0.016	1.0
2018-05-16	63	8.0	6.8	0.05	2.1	0.140	1	1	0.206	3.0	14.0	0.030	1.0
2018-06-21	70	11.0	-	-	3.9	0.005	1	-	0.074	3.3	-	-	-
2018-08-02	140	15.0	-	-	2.0	0.081	1	-	0.056	3.0	15.6	0.036	-
2018-08-29	135	10.0	-	-	2.0	1.770	1	-	1.760	3.0	-	-	-
2018-10-04	111	-3.0	6.8	0.118	2.0	0.308	1	1	0.011	8.7	16.4	0.051	3.1
2018-10-10	101	8.0	6.8	0.092	2.0	0.330	1	1	0.767	12.0	16.7	0.043	1.0
2018-10-16	58	-2.0	6.8	0.082	2.0	0.527	1	1	0.790	9.3	15.1	0.040	1.0
2018-10-23	64	0.0	7.2	0.950	3.9	0.343	1	1	0.520	7.3	13.9	0.074	1.0
2018-10-30	47	2.0	7.2	0.116	2.8	0.392	1	1	0.541	7.0	15.2	0.071	1.0
2018-11-30	93	-2.0	-	-	2.0	0.694	1	-	0.605	11.0	-	-	-
2018-12-27	199	-	-	-	22.9	1.890	102000	-	119.000	21.7	-	-	-
2019-01-31 ²⁾	-	-	-	-	2.1	0.670	2	-	0.792	4.7	-	-	-
# Samples	19	17	10	10	19	18	18	10	17	19	1	1	10
Average	119	2.3	7.02	0.161	6.2	0.485	5787	1.0	7.552	11.0	12.8	0.041	1.2
High	232	15.0	7.20	0.950	34.0	1.890	102000	1	119.00	44.4	16.7	0.074	3.1
Low	47	-3.0	6.80	0.050	2.0	0.005	1	1	0.011	3.0	6.0	0.016	1.0
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	6	2	0	4	0	N/A	N/A	0

2018 Effluent Results

Notes: 1. Green shaded squares show tests reported at less than the stated value, for calculations these are

listed as equal to the value stated, ie. <0.05 is assumed to be 0.05

2. 2019-01-31 result included in table for reference purposes only. These values are not used it the calculations

Please also note that the maximum results for coliforms and total phosphorus were very high on December 27^{th} , 2018. These results may or may not reflect the actual concentrations of these specific parameters or may be high due to a sampling error. Average values for coliforms and total phosphorus would be at 434 cfu/100 ml and 0.61 mg/L, respectively, not taking into consideration the December 27^{th} lab results.

6.1 **RESULTS ANALYSIS**

The results for the December 27th, 2018 laboratory sampling event were unusually high for fecal coliforms and total phosphorus. The resort is at maximum capacity for one week per year, generally from the end of December to the beginning of January. KHMUC provided EDI with wastewater treatment plant data from 2018 and from January 2019. When looking at the levels of phosphate in December 2018 and January 2019, the levels increase starting December 24th and decrease by January 5th which coincides with the higher resort capacity. Also, laboratory testing on January 31st, 2019 yielded levels of total phosphorus at 0.792 mg/L which is consistent with the normal operating levels.

Please note that the results from January 31st, 2019 were included in the above table to show that the results were or had returned to normal levels after the elevated results on December 27th; however they were not included in the averages discussed below.

The average BOD in the effluent was 6.2 mg/L, which is higher when compared to 2016 and 2017 and lower than the prior years. Elevated BOD levels were recorded in the effluent on January 2nd, February 28th and December 27th; however, BOD was below the MSR limits for all the samples. TSS samples averaged 11.0 mg/L with a maximum concentration of 44.4 mg/L, both which were slightly higher than in 2016 and 2017 but still significantly lower than the 2014. TSS was below the MSR limits for all the samples.

Unusually high levels (exceeding discharge limits) of fecal coliforms were found in the effluent on December 27th, (102,000 cfu/100 mL). The river was not sampled on this day so it is unclear if there was impact to the river from the elevated sample. The levels of fecal coliforms were generally low for the remainder of the year and the levels of E.Coli and Enterococci in the effluent were low throughout the year. The high results may or may not reflect the actual fecal coliform concentrations and also may be a result of a sampling error.

Effluent ammonia concentrations were low throughout the year although the levels in the fall were higher than in the spring. The results for ammonia nitrogen were comparable to those in previous years.

The bioassay toxicity testing was not completed this year as it is to be done every 3 years and it was done in 2017. 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

Six samples out of eighteen for ortho phosphorus and four out of seventeen for total phosphorus were above MSR discharge limits, which is lower than last year.

The average for total phosphorus for 2018 was 7.55 mg/L compared to 1.20 mg/L in 2017, 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. Please note that the average phosphorus value would be 0.61 mg/L when the December 27th result is not considered (not clear whether this may be due to a sampling error); average value would be well within or below the previous averages (2012 to 2017).

The average for ortho phosphorus for 2018 was 0.485 mg/L compared to 0.91 in 2017, 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. The high levels of total phosphorus on December 27th significantly raised the yearly average. Without the elevated result included, the average total phosphorus for the year is 0.59 mg/L which is consistent with historical levels.

Twelve samples out of sixteen for ortho phosphorus and eleven out of sixteen for total phosphorus were above MSR discharge limits in 2017. 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.

Low levels of Nitrate-N and Nitrite-N were found in the effluent; however all the levels in the river were low or below the laboratory detection limits indicating no adverse impacts on the river from the effluent. Nitrate, nitrite, TSS and BOD results were slightly higher from last year; however still comparable to previous years.



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

Table 8

Parameter	Unit	MSR Limit	No. Of Samples	Average Value	Max. Value	Samples Over Limit
Flow	m ³ /day	300	365	123.8	262	0
BOD ₅	mg/l	45	19	6.2	34	0
TSS	mg/l	45	19	11.0	44.4	0
Total Phosphorus	mg/l	1	17	7.5	119	4
Ortho Phosphate	mg/l	0.5	18	0.485	1.89	6
Fecal Coliforms	cfu/100ml	200	18	5787	10200	2
Enterococci	cfu/100ml	20	7	1.3	3.1	0
E.Coli	cfu/100ml	77	10	1	1	0
96 hr I C₅₀ Bioassay	1	Non-toxic	1	Pass	Pass	0

2018 MSR Parameter Compliance

This year the test results indicated that out of the samples collected there were 4 exceedances for total phosphorus, 6 exceedances for ortho-phosphorus and 2 exceedance for fecal coliforms.

7.0 SLUDGE PRODUCTION AND DISPOSAL

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

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. All solids were transported to the Crowsnest/Pincher Creek Landfill site.

Hauling data for pumped solids are in Table 9.

Table 9

· · ·	
Month	Vol. Pumped (m³)
January	89.2
February	78.0
March	116.4
April	45.2
May	38.8
June	27.6
July	44.8
August	59.6
September	32.0
October	8.0
November	34.0
December	39.6
Total	613.2

2018 Pumped Solids Data

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

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

8.0 PLANT IMPROVEMENTS & BYPASS EVENTS

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

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

KHMUC will be looking into purchasing a new flow meter for the sludge and they will calibrate their flow meter for the effluent.

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.

Please note that the results for the December 27th laboratory sampling event were unusually high for fecal coliforms and total phosphorus. The source of the elevated results is unknown; however, it could be a result of a sampling error or a laboratory error. The resort is at maximum capacity for one week per year, generally from the end of December to the beginning of January. KHMUC provided EDI with wastewater treatment plant data from 2018 and from January 2019. When looking at the levels of phosphate in December 2018 and January 2019, the levels increase starting December 24th and decrease by January 5th which coincides with the higher resort capacity. Also, laboratory testing on January 31st, 2019 yielded levels of total phosphorus at 0.792 mg/L which is consistent with the normal operating levels.

As seen in the graphs below, the levels of phosphorus were increasing from 2011 until 2015 and there had been a slight decrease since 2015.

The level of total phosphorus was generally low throughout the year except for on December 27th where very high levels were found (119 mg/L). 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/L in 2015, 1.07 mg/L in 2016, 1.20 mg/L in 2017 and 7.55 mg/L in 2018 as shown on Fig 13a. The high December 27th results significantly impacted the yearly average for 2018. Without the high result being included, the yearly average would be 0.61 mg/L which is consistent with historical levels as shown on Fig 13b.

The levels of ortho phosphours were increasing until 2015 and have been decreasing since. 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 mg/L in 2015, 0.88 mg/L in 2016, 0.91 mg/L in 2017 and lower in 2018 at 0.48 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), increased again in 2017 at 12 days over the limit and then decreased to 6 days over the limit in 2018. The days over limit for total phosphorus increased from 2011 until 2015, decreased in 2016, increased to 11 days over the limit in 2017 and decreased again to four days over the limit in 2018.

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 was 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. KHMUC has also agreed to collect a laboratory sample in first week of January going forward in order to better characterize/monitoring the effluent during the peak capacity. It is also recommended that as soon as very high results are found, samples be collected immediately and submitted for testing to ensure the levels drop below the allowable limits.

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Figure 13a Total Phosphorus Levels 2011-2018

Total Phosphorus



Figure 13b Total Phosphorus Levels 2011-2018

2018 average and maximum without the elevated Dec. 27th



Total Phosphorus

Dec. 27th

Page 23 of 25



Figure 14 Ortho Phosphorus Levels 2011-2018

10.0 ASSESSMENT SUMMARY

The total effluent flow recorded for 2018 was 45,147 m^3 with an average of 123.8 m^3 /day. There were no days where the flow was over the allowable limit.

The average BOD in the effluent was 6.2 mg/L, which is higher when compared to 2016 and 2017 and lower than in previous years. BOD was below the MSR limits for all the samples. TSS samples averaged 11.0 mg/L with a maximum concentration of 44.4 mg/L, both which were higher than in 2016 and 2017 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 (February 28th and December 27th) where high levels of fecal coliforms were observed. The levels on both days were above discharge limits. The river was not tested on the same days. Elevated levels of bacteria (fecal coliforms, E.Coli and Enterococci) were observed in the up-stream, side stream and down-stream samples on April 25th, May 3rd, May 9th and May 16th. The levels in the effluent on the same days were near or below laboratory detection limits 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 not completed this year as it is to be completed every three years and it was last done in 2017. The results from 2017 showed that plant effluent was non-toxic.

Six samples out of eighteen for ortho phosphorus and four out of seventeen for total phosphorus were above MSR discharge limits, which is lower than last year. In 2018, ClearPac was 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. Of the 26 units approved, Phase 1 (8 units) and Phase 2 (8 units) are now complete and only one unit remains available. Phase 3 (10 units) is currently being scheduled and construction is planned for summer of 2019. Flows should be monitored closely and additional improvements may be required as growth at the resort continues.

11.0 AUTHORITIZATION AND CLOSING

This report, titled 2018 Sewage Treatment Plant Annual Report, was prepared for KHMUC by Environmental Diagnostics Inc. The material in this report reflects the best judgement of Environmental Diagnostics Inc. based on the information available at the time of preparation. Any use that a third party makes of this report, or reliance on or decisions based on it, is the responsibility of the third party. Environmental Diagnostics Inc. accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions taken based on this report.

ENVIRONMENTAL DIAGNOSTICS INC.

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



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

J:comm/water/2019/W2012-003/Kicking Horse/2018 Sewage Treatment Report

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

Single Femily Sub Division	Flow*											
Single Fainity Sub-Division	(l/unit/day)	Bed Units	Units	2011	2012	2013	2014	2015	2016	2017	2018	2019
Purcell Woods	1363	174	29	39.5	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	20.4
Cache Residences	1363	184	19	25.9	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	21.8
Cedar Creek Estates	1363	222	19	25.9	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	133.5	133.6

Multi Fomily Unito	Flow*											
	(l/unit/day)	Bed Units	Units	2011	2012	2013	2014	2015	2016	2017	2018	2019
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	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	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	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	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	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	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	17.0
The Cedars	1363	12	2	2.7	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	400.9	400.8

Day Users	Flow*	Population									
	(l/unit/day)	(each)	2011	2012	2013	2014	2015	2016	2017	2018	2019
Skiers	36	1000	36.0	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	36.0

Commercial Lodges	Flow* (I/unit/day)	Bed Units	Units	2011	2012	2013	2014	2015	2016	2017	2018	2019
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	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	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	3.7
	Subtotal	84	30	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

Dining Facilitas/Para	Flow*	Area									
Dining Facilites/Bars	(l/m²/day)	(m2)	2011	2012	2013	2014	2015	2016	2017	2018	2019
Peaks Bar & Grill	145	256	37.1	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	29.1
Corks (Vagabond Lodge)	97	120	11.6	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	27.8
Double Black Coffee shop	97	190	18.4	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	124.0	124.1

Daily Wastewater Flow (m3/day)*	705.5	705.5	705.5	705.5	705.5	705.5	705.5	705.4	705.5
Corrected Daily Peak Flow Projections	312*** (actual)	159 (actual)	165 (actual)	146 (actual)	164 (actual)	162 (actual)	244 (actual)	262 (actual)	197 (estimated)

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

** Number reflects hot tub

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





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 <u>Unsurveyed Crown Foreshore, being part of the Columbia River, Kootenay District</u>

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. <u>Outfall</u>

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.

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Telephone: (250) 489-8540 Facsimile: (250) 489-8506 http://www.gov.bc.ca/ http://www.gov.bc.ca/wlap/

B. Environmental Monitoring

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

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

C. Reporting non-compliances

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

D. Financial Security requirements

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

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

Yours truly.

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

AMT/KE:lkm

cc: Environment Canada

Kicking Horse Mountain Sanitary Sewer Services Ltd., 1500 Kicking Horse Trail, PO Box 839, Golden, BC V0A 1H0, Attn: John Urie

Ecofluid, #101-334 E. Kent Ave. South, Vancouver, BC V5X 4N5 Attn: Rolf Loker, VP & Manager of Operations

Ana C. May Tsui, MWLAP-Environment Protection, Cranbrook



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 m³/day, a maximum BOD₅ 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.
- 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.

. . . 2

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*.

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
1	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:03-JAN-18Report Date:09-JAN-18 16:49 (MT)Version:FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2040703 Project P.O. #: NOT SUBMITTED Job Reference: RCR - KICKNG 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.]

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2040703-1 UV TROUGH Sampled By: TJ on 02-JAN-18 @ 14:00 Matrix: WATER Miscellaneous Parameters Biochemical Oxygen Demand Total Suspended Solids	34 38.0	DLHC	20 3.0	mg/L mg/L		04-JAN-18 03-JAN-18	R3932133 R3928837

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

Sample Parameter Qualifier Key:

Qualifier Description												
DLHC Detection Limit Raised: Dilution required due to high concentration of test analyte(s).												
Qualifier Description DLHC Detection Limit Raised: Dilution required due to high concentration of test analyte(s). Fest Method References: ALS Test Code Matrix Test Description Method Reference** BOD-BC-CL Water Biochemical Oxygen Demand (BOD) APHA 5210 B-5 day IncubO2 electrode This analysis is 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. APHA 2540 D-Gravimetric This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids												
ALS Test Code	Matrix	Test Description	Method Reference**									
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode									
This analysis is o oxygen demand dissolved oxygen BOD (CBOD) is	carried out using proce (BOD) are determined n meter. Dissolved BOI determined by adding a	dures adapted from APHA Method 5210B - by diluting and incubating a sample for a sp D (SOLUBLE) is determined by filtering the a nitrification inhibitor to the diluted sample	"Biochemical Oxygen Demand (BOD)". All forms of biochemical ecified time period, and measuring the oxygen depletion using a sample through a glass fibre filter prior to dilution. Carbonaceous prior to incubation.									
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric									
This analysis is ((TSS) are deterr	carried out using proce nined by filtering a sam	dures adapted from APHA Method 2540 "So ople through a glass fibre filter, and by drying	blids". Solids are determined gravimetrically. Total suspended solids 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	: L204070	3	Report Date:	09-JAN-18	Pa	ge 1 of 2
Client:	KICKING HORS 1505 - 17th AV CALGARY AB	SE MOUNTAIN UTILITY ('ENUE SW T2T 0E2	CORPORATIO	ИС				
Contact:	TRAVIS JOBIN							
Test	Matr	rix Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	Wat	er						
Batch	R3932133							
WG2695898 Biochemica	3-2 LCS al Oxygen Demand		94.4		%		85-115	04-JAN-18
WG2695898 Biochemica	8-1 MB al Oxygen Demand		<2.0		mg/L		2	04-JAN-18
TSS-CL	Wat	er						
Batch	R3928837							
WG2693026 Total Susp	6-2 LCS ended Solids		100.9		%		85-115	03-JAN-18
WG2693026 Total Susp	6-1 MB ended Solids		<3.0		mg/L		3	03-JAN-18

Workorder: L2040703

Report Date: 09-JAN-18

Legend:

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

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 Req Canada Toll Free: 1 800 668 www.aisglobal.com



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

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Report To		· · · · · · · · · · · · · · · · · · ·		Report F	Report Format / Distribution							— <u>—</u> ,	3	nalysis su	ubject to	availat	oility)
Company:	Kicking Horse Mou	ntain Water Util	ity Co. Ltd.	Standa	rd Other			Regular (Standard Turnaround Times - Business Days)									
Contact:	Travis Jobin				Excel	Digital	- Fax	O Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confir				Confirm	TAT				
Address:	1500 Kicking Horse	e Trail		Email 1:	tjobin@kicking	horseresort.com			nergen	icy (1-2	Bus, Day	<u>s)</u> - 1009	6 Surchar	ge - Conta	ct ALS to	Confirm	TAT
				Email 2:	pmajer@skircr.	. <u>com</u>		O Sa	ame Da	y or W	eekend Er	nergency	- Contact	t ALS to Co	anfirm TA	Г	
Phone:	250-344-6003	Fax:	-	Email 3:	mskyring@kick	inghorseresort.c	om					Analy	sis Re	quest			
Invoice To	Same as Report ?	Yes	✓ No	Client / I	Project Informati	ion		Plea	ase ir	ndicat	e below	Filtere	d, Prese	erved or	both (F	, P, F/	P)
Hardcopy of I	Invoice with Report?	Yes	V No	Job #:	RCR - Kicking	Horse Mountain	Resort										
Company:	Resorts of the Can	adian Rockies		PO / AFE	:				Ì								
Contact:	Patrick Majer			LSD:	LSD:					ļ							
Address:	1505 - 17th Ave SV	V Calgary AB		-													ers
Phone:		Fax:		Quote #:	Quote #; Q33059									1			tair
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KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received:17-JAN-18Report Date:24-JAN-18 17:05 (MT)Version:FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2045835 Project P.O. #: NOT SUBMITTED Job Reference: RCR/KHMR WW C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details	/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch	
1 2045925 1									
Sampled By:	T.I on 16-JAN-18 @ 10:00								
Matrix:	WATER								
Miscellaneo	bus Parameters								
Biochemical	Oxygen Demand	5.8		2.0	mg/L		17-JAN-18	R3941770	
Orthophosph	nate-Dissolved (as P)	0.050		0.010	mg/L		19-JAN-18	R3939885	
Coliform Bac	teria - Fecal	11		1	CFU/100mL		17-JAN-18	R3939427	
Phosphorus	(P)-Total	0.534		0.020	mg/L	23-JAN-18	24-JAN-18	R3944448	
Total Susper	nded Solids	5.3		3.0	mg/L		22-JAN-18	R3943552	
L2045835-2	AZ 1								
Sampled By:	TJ on 16-JAN-18 @ 10:00								
Matrix:	WATER								
Miscellaneo	us Parameters								
Total Susper	nded Solids	3200	DLHC	45	mg/L		22-JAN-18	R3943552	
L2045835-3	AZ 2								
Sampled By:	TJ on 16-JAN-18 @ 10:00								
Matrix:	WATER								
Miscellaneo	us Parameters								
Total Susper	nded Solids	4380	DLHC	90	mg/L		22-JAN-18	R3943552	

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description		
SPL	Tot-P - Sample	e was Preserved at the laboratory	
Sample Parame	eter Qualifier Key:		
Qualifier	Description		
DLHC	Detection Limit Raised	d: Dilution required due to high concentration of	test analyte(s).
MS-B	Matrix Spike recovery	could not be accurately calculated due to high	analyte background in sample.
Test Method Re	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand dissolved oxygen BOD (CBOD) is o	arried out using proced (BOD) are determined I meter. Dissolved BOD determined by adding a	dures adapted from APHA Method 5210B - "Bic by diluting and incubating a sample for a specif 0 (SOLUBLE) is determined by filtering the sam 1 nitrification inhibitor to the diluted sample prior	chemical Oxygen Demand (BOD)". All forms of biochemical ied time period, and measuring the oxygen depletion using a ple through a glass fibre filter prior to dilution. Carbonaceous to incubation.
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is of Coliform bacteria involves an initial bacteria (Fecal) a	arried out using proceed is enumerated by cultu 24 hour incubation at 4 and is used for non-turb	lures adapted from APHA Method 9222 "Memb uring and colony counting. A known sample vol 44.5 degrees C of the filter with the appropriate vid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". ume is filtered through a 0.45 micron membrane filter. The test growth medium. This method is specific for thermotolerant
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is of persulphate dige	arried out using proced stion of the sample.	lures adapted from APHA Method 4500-P "Pho	osphorus". Total Phosphorus is determined colourimetrically after
PO4-DO-COL-ED	0 Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c colourimetrically	arried out using proced on a sample that has b	lures adapted from APHA Method 4500-P "Pho een lab or field filtered through a 0.45 micron n	sphorus". Dissolved Orthophosphate is determined nembrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is c (TSS) are determ	arried out using proced nined by filtering a sam	lures adapted from APHA Method 2540 "Solids ple through a glass fibre filter, and by drying the	". Solids are determined gravimetrically. Total suspended solids a filter at 104 deg. C.
** ALS test metho	ds may incorporate mo	difications from specified reference methods to	improve performance.
The last two lette	rs of the above test co	de(s) indicate the laboratory that performed and	alytical analysis for that test. Refer to the list below:

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

Chain of Custody Numbers:

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: I	_204583	5	Report Date: 24-	JAN-18	Pa	ge 1 of 2
Client:	KICKING HORSE MOU 1505 - 17th AVENUE CALGARY AB T2T 0E	INTAIN UTILITY COI SW 2	RPORATIO	N				
Contact:	TRAVIS JOBIN							
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	Water							
Batch I	R3941770							
WG2702684-2 Biochemical (2 LCS Dxygen Demand		94.8		%		85-115	17-JAN-18
WG2702684-1 Biochemical (I MB Oxygen Demand		<2.0		mg/L		2	17-JAN-18
FCC-MF-CL	Water							
Batch I	R3939427							
WG2701342-2 Coliform Bact	2 DUP teria - Fecal	L2045835-1 11	9		CFU/100mL	20	65	17-JAN-18
WG2701342-1 Coliform Bact	l MB teria - Fecal		<1		CFU/100mL		1	17-JAN-18
P-T-COL-ED	Water							
Batch I	R3944448							
WG2703641-2 Phosphorus (2 LCS P)-Total	KONELAB_TP	99.97		%		80-120	24-JAN-18
WG2703641-1 Phosphorus (I MB P)-Total		<0.020		mg/L		0.02	24-JAN-18
PO4-DO-COL-ED) Water							
Batch I	R3939885							
WG2701845-2 Orthophospha	2 LCS ate-Dissolved (as P)		109.4		%		70-130	19-JAN-18
WG2701845-1 Orthophospha	I MB ate-Dissolved (as P)		<0.010		mg/L		0.01	19-JAN-18
TSS-CL	Water							
Batch I	R3943552							
WG2702604-2	2 LCS		00.0		0/			
i otal Suspen	aea Solias		93.3		%		85-115	22-JAN-18
Total Suspen	ded Solids		<3.0		mg/L		3	22-JAN-18

Workorder: L2045835

Report Date: 24-JAN-18

Legend:

Limit DUP	ALS Control Limit (Data Quality Objectives)
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.



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



L2045835-COFC

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Report To	Report Fo	ormat / Distribut	ion		Serv									-	alacitta. A
Company: Kicking Horse Mountain Resort Utility Corporation	Standard	Standard Other						Regular (Standard Turnaround Times - Business Dave)							
Contact: Travis Jobin	PDF	Excel		Fax	O Priority (2-4 Business Days) - 50% Surcharge - Contract ALS to Confirm TAT										
Address: 1500 Kicking Horse Trail	Email 1:	tiobin@kickingh	orseresort.com		O Eme	eroeno	ov (1-7	2 8us. D)avs) -	100%	Surchary			Case	- 101
	Email 2:	pmajer@skircr.(com		O Sam	ne Da	v or W	eekend	Emerg	ency -	Contact		nfirm T/		
Phone: 250-344-8442 Fax:	Email 3:	mskyring@kicki	nghorseresort.c	om			,		A	nalvs	is Rec			.1	
Involce To Same as Report ? Yes Vo	Client / P	roject Informatio			Pleas	se in	dicat	e helr	w Fill	ered	Prece	nued or i	both /r		
Hardcopy of Invoice with Report? Yes I No	Job #:	RCR/KHM	AR W/14/				_			cica,				·, м, гл	<u>/P)</u>
Company: Resorts of the Canadian Rockies	PO / AFE:		+0_00		├ <u>├</u> -			┼───┤					+	···	
Contact: Patrick Majer	LSD:			·····	4				ļ		5				
Address: 1505 - 17th Ave SW Calgary AB		······································		<u></u>	1			.			R.				μ
Phone: 403-861-8730 Fax:	Quote #	Quate #: BUTTELLATE							ĺ		युग				iner
Lab Work Order #	A1 C	ALS ALS			- "I						٦ م				nta
(lab use.only)	Contact: LS Sampler: 7					~		<u>ل</u>	7	Y				ပ္ခ်	
Sample Sample Identification			<	<u></u>		.+	ŝ		Ĩ	티	- Y				ero
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KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received:01-MAR-18Report Date:08-MAR-18 15:56 (MT)Version:FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2062374 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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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2062374-1 UV TROUGH Sampled By: TJ on 28-FEB-18 @ 12:00 Matrix: WATER Miscellaneous Parameters Biochemical Oxygen Demand Orthophosphate-Dissolved (as P) Coliform Bacteria - Fecal Phosphorus (P)-Total Total Suspended Solids	17 0.575 2100 1.62	DLHC DLHC DLA DLHC DLHC	16 0.050 100 0.10 6.0	mg/L mg/L CFU/100mL mg/L mg/l	06-MAR-18	01-MAR-18 02-MAR-18 01-MAR-18 07-MAR-18 06-MAR-18	R3977799 R3975388 R3974914 R3978472 P3970224

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description											
SPL	Total-P - Samp	le was Preserved at the laboratory										
Sample Parame	eter Qualifier Key:											
Qualifier	Description											
DLA	Detection Limit adjuste	ed for required dilution										
DLHC	Detection Limit Raised	: Dilution required due to high concentration of	test analyte(s).									
Test Method Re	Test Method References:											
ALS Test Code	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 of Coliform bacteria involves an initial bacteria (Fecal) a	arried out using proced is enumerated by cultu 24 hour incubation at 4 and is used for non-turb	ures adapted from APHA Method 9222 "Memb Iring and colony counting. A known sample volu 14.5 degrees C of the filter with the appropriate id water with a low background bacteria level.	rane Filter Technique for Members of the Coliform Group". ume is filtered through a 0.45 micron membrane filter. The test growth medium. This method is specific for thermotolerant									
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS									
This analysis is opersulphate dige	arried out using proced stion of the sample.	ures adapted from APHA Method 4500-P "Pho	sphorus". Total Phosphorus is determined colourimetrically after									
PO4-DO-COL-ED	0 Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS									
This analysis is c colourimetrically	arried out using proced on a sample that has be	ures adapted from APHA Method 4500-P "Pho een lab or field filtered through a 0.45 micron m	sphorus". Dissolved Orthophosphate is determined nembrane filter.									
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric									
This analysis is c (TSS) are determ	arried out using proced nined by filtering a samp	ures adapted from APHA Method 2540 "Solids ble through a glass fibre filter, and by drying the	". Solids are determined gravimetrically. Total suspended solids filter at 104 deg. C.									
** ALS test method	ds may incorporate mod	difications from specified reference methods to	improve performance.									
The last two lette	rs of the above test coo	le(s) indicate the laboratory that performed ana	lytical 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.

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			Quam	y conti	orneport			
		Workorder:	L206237	4	Report Date: ()8-MAR-18	Pa	ge 1 of 2
Client:	KICKING HORSE MOUI 1505 - 17th AVENUE S CALGARY AB T2T 0E2	NTAIN UTILITY CO 3W 2	RPORATIO	ИС				
Contact:	TRAVIS JOBIN							
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	Water							
Batch I WG2727466-2 Biochemical (R3977799 2 LCS Oxygen Demand		96.9		%		85-115	01-MAR-18
WG2727466-1 Biochemical (I MB Oxygen Demand		<2.0		mg/L		2	01-MAR-18
FCC-MF-CL Batch I WG2725806-1 Coliform Bact	Water R3974914 I MB teria - Fecal		<1		CFU/100mL		1	01-MAR-18
P-T-COL-ED	Water							
Batch I WG2727790-2 Phosphorus (R3978472 2 LCS P)-Total	KONELAB_TP	93.0		%		80-120	07-MAR-18
WG2727790- 1 Phosphorus (I MB P)-Total		<0.020		mg/L		0.02	07-MAR-18
PO4-DO-COL-EE Batch I WG2725912-2	D Water R3975388 2 LCS							
Orthophospha	ate-Dissolved (as P)		109.7		%		70-130	02-MAR-18
WG2725912-1 Orthophospha	I MB ate-Dissolved (as P)		<0.010		mg/L		0.01	02-MAR-18
TSS-CL	Water							
Batch I WG2727746-2 Total Suspen	R3979224 2 LCS ded Solids		90.4		%		85-115	06-MAR-18
WG2727746-1 Total Suspen	I MB ded Solids		<3.0		mg/L		3	06-MAR-18

Workorder: L2062374

Report Date: 08-MAR-18

Legend:

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

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



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Contact: Travis Jobin	PDF	Excel	Digital	Fax	O Pri	ority (_			د ردو.		nchaig	च - ५० म	CaCt AL	ວເວເຊ	miim	тат Г	
Address: 1500 Kicking Horse Trail	Email 1:	tjobin@kickingh	orseresort.com		O Em	iergency	gency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT					TAT					
	Email 2:	pmajer@skircr.	com		O 5a	ame Day or Weekend Emergency - Contact ALS to Confirm TAT											
Phone: 250-344-6003 Fax:	Email 3:	mskyring@kicki	inghorseresort.co	<u>m</u>			Analysis Request										
Invoice To Same as Report ? 🛄 Yes 🗹 No	Client / Pr	oject Informatio	on		Ple	Please indicate below Filtered, Preserved or both (F, P, F/						7P)					
Hardcopy of Invoice with Report? Yes Vo	Job #:	RCR - Kicking H	Horse Mountain F	Resort			_										
Company: Resorts of the Canadian Rockies	PO/AFE:							T									
Contact: Patrick Majer	LSD:																
Address: 1505 - 17th Ave SW Calgary AB														ļ			lers
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Also provided on another Excel tab are the ALS locat	ion addresses	s, phone numbe	ers and sample	container / prese	rvatio	on / ho	lding	g time	table	e for o	comr	non a	inaly	ses.	h . \		
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KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received:16-MAR-18Report Date:21-MAR-18 16:52 (MT)Version:FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2068591 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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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2068591-1 UV TROUGH Sampled By: TJ on 15-MAR-18 @ 13:00 Matrix: WATER Miscellaneous Parameters Biochemical Oxygen Demand Orthophosphate-Dissolved (as P) Coliform Bacteria - Fecal Phosphorus (P)-Total	3.9 0.932 49 1.05	DLHC DLHC	2.0 0.050 1 0.10	mg/L mg/L CFU/100mL mg/L	20-MAR-18	16-MAR-18 17-MAR-18 16-MAR-18 21-MAR-18	R3993069 R3992467 R3987565 R3992349

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

Reference Information

Qualifiers for Sample Submission Listed:

	Description		
SPL	Tot-P - Samp	le was Preserved at the laboratory	
Sample Param	eter Qualifier Key:		
Qualifier	Description		
DLHC	Detection Limit Raise	ed: Dilution required due to high concentration c	of test analyte(s).
Test Method R	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is oxygen demand dissolved oxyge BOD (CBOD) is	carried out using proce (BOD) are determined n meter. Dissolved BO determined by adding	dures adapted from APHA Method 5210B - "Bi by diluting and incubating a sample for a spec D (SOLUBLE) is determined by filtering the sar a nitrification inhibitor to the diluted sample price	ochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a nple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
		duras adapted from ADUA Mathad 0222 "Mam	hanna Eiltea Tachainne fan Marshana af tha Californa Oranall
This analysis is Coliform bacteria involves an initia bacteria (Fecal)	carried out using proce a is enumerated by cul al 24 hour incubation at and is used for non-tur	turing and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriate bid water with a low background bacteria level.	blume is filtered through a 0.45 micron membrane filter. The test e growth medium. This method is specific for thermotolerant
This analysis is Coliform bacteria involves an initia bacteria (Fecal) P-T-COL-ED	carried out using proce a is enumerated by cul al 24 hour incubation at and is used for non-tur Water	turing and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriate bid water with a low background bacteria level. Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is Coliform bacteria involves an initia bacteria (Fecal) P-T-COL-ED This analysis is persulphate dige	carried out using proce a is enumerated by cul al 24 hour incubation at and is used for non-tur Water carried out using proce estion of the sample.	turing and colony counting. A known sample vc 44.5 degrees C of the filter with the appropriate bid water with a low background bacteria level. Total P in Water by Colour dures adapted from APHA Method 4500-P "Ph	APHA 4500-P PHOSPHORUS osphorus". Total Phosphorus is determined colourimetrically after
This analysis is Coliform bacteria involves an initia bacteria (Fecal) P-T-COL-ED This analysis is persulphate dige PO4-DO-COL-E	carried out using proce a is enumerated by cul al 24 hour incubation at and is used for non-tur Water carried out using proce estion of the sample. D Water	turing and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriate bid water with a low background bacteria level. Total P in Water by Colour dures adapted from APHA Method 4500-P "Ph Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS APHA 4500-P PHOSPHORUS
This analysis is Coliform bacteria involves an initia bacteria (Fecal) P-T-COL-ED This analysis is persulphate dige PO4-DO-COL-E This analysis is colourimetrically	carried out using proce a is enumerated by cul al 24 hour incubation at and is used for non-tur Water carried out using proce estion of the sample. D Water carried out using proce on a sample that has	dures adapted from APHA Method 9222 Method 44.5 degrees C of the filter with the appropriate bid water with a low background bacteria level. Total P in Water by Colour dures adapted from APHA Method 4500-P "Ph Diss. Orthophosphate in Water by Colour dures adapted from APHA Method 4500-P "Ph been lab or field filtered through a 0.45 micron	APHA 4500-P PHOSPHORUS APHA 4500-P PHOSPHORUS Iosphorus". Total Phosphorus is determined colourimetrically after APHA 4500-P PHOSPHORUS Iosphorus". Total Phosphorus is determined colourimetrically after APHA 4500-P PHOSPHORUS Iosphorus". Dissolved Orthophosphate is determined membrane filter.
This analysis is Coliform bacteria involves an initia bacteria (Fecal) P-T-COL-ED This analysis is persulphate dige PO4-DO-COL-EI This analysis is colourimetrically TSS-CL	carried out using proce a is enumerated by cul al 24 hour incubation at and is used for non-tur Water carried out using proce estion of the sample. D Water carried out using proce on a sample that has Water	dures adapted from APHA Method 9222 Meth turing and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriate bid water with a low background bacteria level. Total P in Water by Colour dures adapted from APHA Method 4500-P "Ph Diss. Orthophosphate in Water by Colour dures adapted from APHA Method 4500-P "Ph been lab or field filtered through a 0.45 micron Total Suspended Solids	APHA 4500-P PHOSPHORUS osphorus". Total Phosphorus is determined colourimetrically after APHA 4500-P PHOSPHORUS osphorus". Total Phosphorus is determined colourimetrically after APHA 4500-P PHOSPHORUS osphorus". Dissolved Orthophosphate is determined membrane filter. APHA 2540 D-Gravimetric

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

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.



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		Workorder:	L2068591	Re	eport Date: 21-M	AR-18	Pag	e 1 of 2
Client: H	KICKING HORSE MOUNT 1505 - 17th AVENUE SW CALGARY AB T2T 0E2	AIN UTILITY CO	RPORATIO	N				
Contact: ^T	FRAVIS JOBIN							
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	Water							
Batch R3 WG2737089-2 Biochemical Ox	993069 LCS ygen Demand		92.8		%		85-115	16-MAR-18
WG2737089-1 Biochemical Ox	MB sygen Demand		<2.0		mg/L		2	16-MAR-18
FCC-MF-CL	Water							
Batch R3 WG2734996-1 Coliform Bacter	987565 MB ia - Fecal		<1		CFU/100mL		1	16-MAR-18
P-T-COL-ED	Water							
Batch R3 WG2736340-2 Phosphorus (P)	992349 LCS	KONELAB_TP	100 7		0/		00.400	24 MAD 40
WG2736340-1 Phosphorus (P)	MB I-Total		<0.020		mg/L		0.02	21-MAR-10 21-MAR-18
PO4-DO-COL-ED	Water							
Batch R3	992467							
Orthophosphate	e-Dissolved (as P)		106.4		%		70-130	17-MAR-18
WG2734648-1 Orthophosphate	MB e-Dissolved (as P)		<0.010		mg/L		0.01	17-MAR-18
TSS-CL	Water							
Batch R3 WG2736275-2 Total Suspende	991817 LCS ed Solids		105.8		%		85-115	20-MAR-18
WG2736275-1 Total Suspende	MB ed Solids		<3.0		mg/L		3	20-MAR-18

Workorder: L2068591

Report Date: 21-MAR-18

Legend:

Limit DUP	ALS Control Limit (Data Quality Objectives)
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

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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.

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Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickinght	orseresort.com		OEme	ergency	₩ (1-2 E	Jus. Day.	s) • 10	70% Sur	rcharge	e - Cont.	ACT ALS	to Confi	an IAT	{
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Phone:	250-344-6003 Fax:	Email 3:	mskyring@kicklr	nghorseresort.cc	om					Ar	nalysi	s Rec	quest		<u> </u>	E(D)	
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KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received: 20-APR-18 Report Date: 07-MAR-19 10:32 (MT) Version: FINAL REV. 3

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2082692 Project P.O. #: NOT SUBMITTED Job Reference: WEEK 1-2018 SPRING EMS PROGRAM C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch		
Sampled By: T.I/PAG on 19-APR-18 @ 14:00									
Matrix: WATER									
Miscellaneous Parameters									
Ammonia, Total (as N)	<0.050		0.050	mg/L		24-APR-18	R4022255		
Biochemical Oxygen Demand	<2.0		2.0	mg/L		20-APR-18	R4023099		
Orthophosphate-Dissolved (as P)	0.302		0.010	mg/L		21-APR-18	R4019369		
Enterococcus	See Attached			0		20-APR-18	R4024201		
Coliform Bacteria - Fecal	<1		1	CFU/100mL		20-APR-18	R4020067		
MPN - E. coli	<1		1	MPN/100mL		20-APR-18	R4020048		
Phosphorus (P)-Total	0.368		0.020	mg/L	25-APR-18	26-APR-18	R4023846		
Total Suspended Solids	<3.0		3.0	mg/L		25-APR-18	R4022864		
NO2, NO3 and Sum of NO2/NO3									
Nitrate in Water by IC									
Nitrate (as N)	12.0		0.020	mg/L		20-APR-18	R4022150		
Nitrate+Nitrite	10.1		0.050						
Nitrate and Nitrite (as N)	12.1		0.050	mg/L		24-APR-18			
Nitrite (as N)	0.039		0.010	mg/L		20-APR-18	R4022150		
L2082692-2 COLUMBIA RIVER UPSTREAM									
Sampled By: TJ/PAG on 19-APR-18 @ 15:00									
Matrix: WATER									
Miscellaneous Parameters									
Ammonia, Total (as N)	<0.050		0.050	mg/L		24-APR-18	R4022255		
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		21-APR-18	R4019369		
Enterococcus	See Attached					20-APR-18	R4024201		
Coliform Bacteria - Fecal	<1		1	CFU/100mL		20-APR-18	R4020067		
MPN - E. coli	<1		1	MPN/100mL		20-APR-18	R4020048		
Phosphorus (P)-Total	<0.020		0.020	mg/L	25-APR-18	26-APR-18	R4023846		
Total Suspended Solids	18.0		3.0	mg/L		25-APR-18	R4022864		
NO2, NO3 and Sum of NO2/NO3				-					
Nitrate in Water by IC									
Nitrate (as N)	0.128		0.020	mg/L		20-APR-18	R4022150		
Nitrate+Nitrite									
Nitrate and Nitrite (as N)	0.128		0.050	mg/L		24-APR-18			
Nitrite in Water by IC Nitrite (as N)	~0.010		0.010	ma/l		20-APR-18	R4022150		
	~0.010		0.010	iiig/ L		20 701 11-10	117022100		
$\begin{array}{ccc} L2002092-3 & OOLOWIDIA RIVER DOWN STREAM \\ Sampled By: T I/DAG on 10 ADD 19 @ 15:00 \\ \end{array}$									
Miscellaneous Parameters									
Ammonia, Total (as N)	<0.050		0.050	ma/l		24-APR-18	R4022255		
Orthophosphate-Dissolved (as P)	<0.000		0.000	mg/L		21-APR-18	R4019369		
Enterococcus	See Attached		0.010			20-APR-18	R4024201		
Coliform Bacteria - Fecal	<1		1	CFU/100ml		20-APR-18	R4020067		
MPN - E. coli	<1		1	MPN/100ml		20-APR-18	R4020048		
Phosphorus (P)-Total	<0.020		0.020	ma/L	25-APR-18	26-APR-18	R4023846		
Total Suspended Solids	12.0		3.0	ma/L		25-APR-18	R4022864		
NO2, NO3 and Sum of NO2/NO3			0.0						
Nitrate in Water by IC									
Nitrate (as N)	0.123		0.020	mg/L		20-APR-18	R4022150		
Nitrate+Nitrite									
Nitrate and Nitrite (as N)	0.123		0.050	mg/L		24-APR-18			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2082692-3 COLUMBIA RIVER DOWN STREAM Sampled By: TJ/PAG on 19-APR-18 @ 15:00							
Matrix: WATER							
Nitrite (as N)	<0.010		0.010	mg/L		20-APR-18	R4022150
L2082692-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ/PAG on 19-APR-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							B /
Ammonia, Total (as N)	<0.050		0.050	mg/L		24-APR-18	R4022255
Enteroposius	<0.010		0.010	mg/L		21-APR-18	R4019369
Coliform Bacteria - Fecal	See Allacheu		1	CEU/100ml		20-APR-18	R4024201
MPN - E coli	2	OCR	1	MPN/100mL		20-APR-18	R4020007
Phosphorus (P)-Total	<0.020		0.020	ma/L	25-APR-18	26-APR-18	R4023846
Total Suspended Solids	10.7		3.0	ma/L		25-APR-18	R4022864
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	0.129		0.020	mg/L		20-APR-18	R4022150
Nitrate+Nitrite Nitrate and Nitrite (as N)	0.129		0.050	mg/L		24-APR-18	
Nitrite in Water by IC	0.010		0.040				D 4000450

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

Reference Information

Sample Parameter Qualifier Key:

OCR Parameter is out of client specific range. Fest 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 sepecified time period, and masuing the oxygen depletion using a disolved oxygen meter. Disolved BOD (SOLUBEL) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (BOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation. EC-MPN-CL Water MPN - E. coli APHA 9223B 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 response are counted. The final result is obtained by comparing the positive response are counted. The final result is obtained by comparing the positive response are counted. The final result is obtained by comparing the positive response are counted. The final result is obtained by comparing the positive response are counted. The final result is obtained by comparing the positive response are counted. The final result is obtained by comparing the positive response are counted. The final result is obtained by comparing the positive response are c		Description		
Test Education Matrix Test Description Method Reference** ALS Test Code Matrix Test Description Method Reference** BOD-BC-CL Water Biochemical Oxygen Demand (BOD) APHA 5210 B-5 day IncubO2 electrode This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)", All forms of biochemical oxygen demand (BOD) All forms of biochemical oxygen demand (BOD) BOD (BCDD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation. Ec-MPN-CL Water MPN - E. coil This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrates and then annue of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses are counted. The final result is obtained by comparing the positive response are counted. The final result is obtained by comparing the positive response are counted. The final result is obtained by comparing the positive response are counted. The final result is obtained by counting, a known sample volume is filtered through a 0.46 micron membrane filter. The test acteria is enumerated by culturing and colory counting. A known sample volume is filtered through a 0.46 micron membrane filter. The test acteria is enumerated by culturing and colory counting. A known sample volume is filtered through a 0.46 micron membrane filter. The test acteria is enumerated by culturing and colory counting. A known sample volume is filtered through a 0.46 micron membrane filter. The test bacteria is enumerated by culturing and colory counting.	OCR	Parameter is out of cl	ient specific range.	
ALS Test Code Matrix Test Description Method Reference** BOD-BC-CL Water Biochemical Oxygen Demand (BOD) APHA 5210 8-6 day Incub-O2 electrode This analysis is carried out using procedures adapted from APHA Method 52108 - "Biochemical Oxygen Demand (BOD)". All forms of biochemical Oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLJBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (BOD): Settermined by dilution and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLJBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (BOD): Settermined by dilution and the diluted sample prior to incubation. BOD-HACL Water MPN - E. col in the diluted sample prior to incubation. Substrate Collitorm Test'. E. col and Total Colliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and them the number of wells exhibing a positive responses to a probability table. The final result is obtained by comparing the positive responses to a probability table. Recommended Holding Time: Sample: 1 day APHA 9222D This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group!. Collform 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!. Coll form	est Method R	eferences:		
BOD-BC-CL Wate 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)*. AID Toms of biochemical oxygen Demand (BOD)*. BOD (BDD) is determined by difuting an incubiating a sample for a specified time period; and measuring the oxygen depletion using a disoved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to inclution. Carbonaceous BOD (BDD) is determined by difuting a sample for a specified time perior to inclusion. EC-MPN-CL Wate MPN - E. coli APHA 9223 This analysis is carried out using procedures adapted from APHA Method 9223 *Enzyme Usication and Total Collorm are determined winul aneously. The sample is mixed with a mixture hydrolyzable substrates and then ne sended in a multi-well packet. APHA 92210 Recommended Holding Time-sample through a glass. Fe CAPCAL Wate Neclo Collorm Count-MF APHA 9220 This analysis is carried out using procedures adapted from APHA Method 9222 *Enzyme. Filter Technique for Members of the Collform Group? Collform bacteria is enumerated by culturing and colony counting. A known sample volume is liftered through a 0.45 micron membrane filter. The te involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate group medium. Filter Technique for Members of the Collform Group? Collform bacteria is enumerated by culturing and colony counting. A known sample	ALS Test Code	Matrix	Test Description	Method Reference**
This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygon Demand (BOD)". All forms of biochemical dissolved oxygon meter. Dissolved BOD (SOLUBLE) is determined by tiltering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a intiffication 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 included tof T 8 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 is mixed with a mixture by dow zable solution and by comparing the positive response are counted. The packet is includented by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The te 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 (Feac) and is used for non-turbid water with a low background bacteria level. N2N3-CALC-CL Water Nitrate+Nitrite CALCULATION NH3-FCL Water Ammonia by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC This analysis is carried out, on sulfuric acid preserved samples, using procedures. NO2-1C-N-CL Water Nitrate in Water by IC EPA 300.1 (mod) Inorganic anions are analyzed by IChromatography with conductivity and/or UV detection. NO3-1C-N-CL Water Table In Water by IC EPA 300.1 (mod) Inorganic anions are analyzed by IChromatography with conductivity and/or UV detection. NO3-1C-N-CL Water Table In Water by IC EPA 300.1 (mod) Inorganic anions are analyzed by IChromatography with condu	BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
EC-MPN-CL Water MPN - E. coli APHA 9233B This analysis is carried out using procedures adapted from APHA Method 9232 Tenzyme analysis is carried out using procedures and then sealed in a multi-well packet. Seample is mixed with a mixture hydrolysible substrates and then sealed in a multi-well packet. The packet is inclubated 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. APHA 9222D Recommended Holding Times and then the number of wells exhibiting a positive response size adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Collform Group". FCC-MF-CL Water Fecal Collform Count-MF APHA 9222D This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Collform Group". Collform bacteria Is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The teinvokes an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate group addition of the sectific for thermotolerant level. NA3-CALC-CL Water Nitrate-Nitrite CALCULATION NH3-FCL Water Nitrate-Nitrite EPA 300.1 (mod) Inorganic anions are allow to subget form APHA Method 4500-P PHOSPHORUS Sole and proves and proves adapted from APHA Method 4500-P PHOSPHORUS ND24CA-NCL Water Ni	This analysis is o oxygen demand dissolved oxyger BOD (CBOD) is	carried out using proce (BOD) are determined n meter. Dissolved BOI determined by adding	dures adapted from APHA Method 5210B - "Bi by diluting and incubating a sample for a spec O (SOLUBLE) is determined by filtering the sar a nitrification inhibitor to the diluted sample price	ochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a nple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
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 FCCCMF-CL Water Fecal Coliform Count-MF APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by outputing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The te 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. V2N3-CALC-CL Water Ammonia by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC This analysis is carried out. on sulfucia caicd preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37-42, TRe Royal Soci of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston al. NO2-IC-N-CL Water Nitrate in Water by IC EPA 300.1 (mod) Inorganic anions are analysed by Ion Chromatography with conductivity and/or UV detection. VC3-IC-N-CL Water Nitrate in Water by IC EPA 300.1 (mod) Inorganic anions are analysis by any Soci procedures adapted from APHA Method 4500-P PHOSPHORUS This analysis is carried out. using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically a persuphate digestion of tre sample: VC3-LC-N-CL Water Notare type with conductivity and/or UV detection. VC3-LC-N-CL Water Total P in Water by Colour APHA 4500-P PHOSPHORUS This analys	EC-MPN-CL	Water	MPN - E. coli	APHA 9223B
FCC-MF-CLWaterFecal Coliform Count-MFAPHA 9222DThis 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 te involves an initial 24 hour inclubation at 44.5 degrees C of the filter with the appropriate growthered through a 0.45 micron membrane filter. The te involves an initial 24 hour inclubation at 44.5 degrees C of the filter with the appropriate growthered through a 0.45 micron membrane filter. The te involves an initial 24 hour inclubation at 44.5 degrees C of the filter with the appropriate growthered through a 0.45 micron membrane filter. The te involves an initial 24 hour inclubation at 44.5 degrees C of the filter with the appropriate growthered through a 0.45 micron membrane filter. The te involves an initial 24 hour inclubation at 44.5 degrees C of the filter with the appropriate growthered through a 0.45 micron membrane filter. The te involves an initial 24 hour inclubation at 44.5 degrees C of the filter with the appropriate growthered through a 0.45 micron membrane filter. The te involves and interval to an using procedures modified from J. Environ. Monit., 2005, 7, 37-42, RSCN13-IC-N-CLWaterNitrite in Water by ICEPA 300.1 (mod)Inorganic anions are analyzed by Ion Circuragraphy with conductivity and/or UV detection.PA 4500-P PHOSPHORUSN03-IC-N-CLWaterTotal P in Water by ColourAPHA 4500-P PHOSPHORUSNorganic anions are analyzed is carried out using procedures adapted from APHA Method 4500-P "Phosphorus is determined colourimetrically a persulphate digestion of the sample.Solidon PHA 4500-P PHOSPHORUSPot-Do-CoL-EDWater	This analysis is of Substrate Colifor sample is mixed The packet is ind response are con probability table. Recommended H Sample: 1 day Reference: APH.	carried out using proce rm Test". E. coli and To with a mixture hydroly: cubated for 18 or 24 ho unted. The final result i Holding Time:	dures adapted from APHA Method 9223 "Enzy otal Coliform are determined simultaneously. T zable substrates and then sealed in a multi-wel urs and then the number of wells exhibiting a p s obtained by comparing the positive response	me he Il packet. positive es to a
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 te 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. V2N3-CALC-CL Water Nitrate+Nitrite CALCULATION VH3-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 Soci of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston al. VQ2-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. VQ3-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. -2-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 a bersulphate digestion of the sample. -204-D0-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 2040-D0-COL-ED Water Total Suspended Solids APHA 2540 D-Gravimetric -27-COL 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 sol -28-CL Water Total Suspended Solids APHA	-CC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
N2N3-CALC-CLWaterNitrate+NitriteCALCULATIONN13-F-CLWaterAmmonia by FluorescenceJ. ENVIRON. MONIT., 2005, 7, 37-42, RSCThis analysis is carried out. on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Soc of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston al.NO2-IC-N-CLWaterNitrite in Water by ICEPA 300.1 (mod)Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.EPA 300.1 (mod)NO3-IC-N-CLWaterNitrate in Water by ICEPA 300.1 (mod)Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.FPA 300.1 (mod)NO3-IC-N-CLWaterTotal P in Water by ColourAPHA 4500-P PHOSPHORUSP-T-COL-EDWaterTotal P in Water by ColourAPHA 4500-P PHOSPHORUSProt-CoL-EDWaterDiss. Orthophosphate in Water by ColourAPHA 4500-P PHOSPHORUSPO4-DO-COL-EDWaterDiss. Orthophosphate in Water by ColourAPHA 4500-P PHOSPHORUSThis 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 micronAPHA 2540 D-GravimetricTSS-CLWaterTotal Suspended SolidsAPHA 2540 D-GravimetricThis analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solTSS-CLWaterTotal Sus	This analysis is o Coliform bacteria involves an initia bacteria (Fecal)	carried out using proce a is enumerated by cult I 24 hour incubation at and is used for non-tur	dures adapted from APHA Method 9222 "Mem uring and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriat bid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". Jume is filtered through a 0.45 micron membrane filter. The test e growth medium. This method is specific for thermotolerant
NH3-F-CLWaterAmmonia by FluorescenceJ. ENVIRON. MONIT., 2005, 7, 37-42, RSCThis analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Soc of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Wastor al.NO2-IC-N-CLWaterNitrite in Water by ICEPA 300.1 (mod)Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.EPA 300.1 (mod)NO3-IC-N-CLWaterNitrate in Water by ICEPA 300.1 (mod)Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.FPA 300.1 (mod)Port-COL-EDWaterTotal P in Water by ColourAPHA 4500-P PHOSPHORUSP-T-COL-EDWaterTotal P in Water by ColourAPHA 4500-P PHOSPHORUSPod-Do-COL-EDWaterDiss. Orthophosphate in Water by ColourAPHA 4500-P PHOSPHORUSPod-Do-COL-EDWaterDiss. Orthophosphate in Water by ColourAPHA 4500-P PHOSPHORUSThis analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that bas been lab or field filtered through a 0.45 micron membrane filter.APHA 2540 D-GravimetricTSS-CLWaterTotal Suspended SolidsAPHA 2540 D-GravimetricThis analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended sol (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C. <td>N2N3-CALC-CL</td> <td>Water</td> <td>Nitrate+Nitrite</td> <td>CALCULATION</td>	N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Soc of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Wastor 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 a 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". Total Phosphorus is determined colourimetrically a 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 sol (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.	NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
NO2-IC-N-CLWaterNitrite in Water by ICEPA 300.1 (mod)Inorganic anions are analyzed by IonNitrate in Water by ICEPA 300.1 (mod)NO3-IC-N-CLWaterNitrate in Water by ICEPA 300.1 (mod)Inorganic anions are analyzed by IonTotal P in Water by ColourAPHA 4500-P PHOSPHORUSPr-T-COL-EDWaterTotal P in Water by ColourAPHA 4500-P PHOSPHORUSThis analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus is determined colourimetrically a persulphate digestion of the sample.Diss. Orthophosphate in Water by ColourAPHA 4500-P PHOSPHORUSThis analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically a colourimetrically on a sample.Diss. Orthophosphate in Water by ColourAPHA 4500-P PHOSPHORUSThis 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 metrical trough a 0.45 micron metricalAPHA 2540 D-GravimetricTSS-CLWaterTotal Suspended SolidsAPHA 2540 D-GravimetricThis analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended sol (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.	This analysis is o of Chemistry, "Fl al.	carried out, on sulfuric ow-injection analysis v	acid preserved samples, using procedures mo vith fluorescence detection for the determinatio	dified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Societ n of trace levels of ammonium in seawater", Roslyn J. Waston e
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. APHA 4500-P PHOSPHORUS 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 a persulphate digestion of the sample. Diss. Orthophosphate in Water by Colour APHA 4500-P PHOSPHORUS 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". Total Phosphorus is determined colourimetrically a colourimetrically on a sample. 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 metrican effilter. 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 solid (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.	NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
NO3-IC-N-CLWaterNitrate in Water by ICEPA 300.1 (mod)norganic anions are analyzer by Ion C/matography with conductivity and/or UV detection.P-T-COL-EDWaterTotal P in Water by ColourAPHA 4500-P PHOSPHORUSThis analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically a beersulphate digestion of the sample.Diss. Orthophosphate in Water by ColourAPHA 4500-P PHOSPHORUSPO4-DO-COL-EDWaterDiss. Orthophosphate in Water by ColourAPHA 4500-P PHOSPHORUSChis analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically a beer lab or field filtered through a 0.45 micron methrane filter.'SS-CLWaterTotal Suspended SolidsAPHA 2540 D-GravimetricThis analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended sol'SS-CLWaterTotal Suspended SolidsAPHA 2540 D-GravimetricThis analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solThis analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended sol	norganic anions	are analyzed by Ion C	hromatography with conductivity and/or UV de	tection.
P-T-COL-ED Water Total P in Water by Colour APHA 4500-P PHOSPHORUS This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically a bersulphate digestion of the sample. Diss. Orthophosphate in Water by Colour APHA 4500-P PHOSPHORUS PO4-DO-COL-ED Water Diss. Orthophosphate in Water by Colour APHA 4500-P PHOSPHORUS Post-colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Diss. Orthophosphate Solids APHA 2540 D-Gravimetric This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended sol APHA 2540 D-Gravimetric	NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
P-T-COL-EDWaterTotal P in Water by ColourAPHA 4500-P PHOSPHORUSThis analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically a bersulphate digestion of the sample.Diss. Orthophosphate in Water by ColourAPHA 4500-P PHOSPHORUSPO4-DO-COL-EDWaterDiss. Orthophosphate in Water by ColourAPHA 4500-P PHOSPHORUSThis 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 metrical TSS-CLWaterTotal Suspended SolidsAPHA 2540 D-GravimetricThis analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended sol (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.APHA 4500-P	Inorganic anions	are analyzed by Ion C	hromatography with conductivity and/or UV de	tection.
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically a bersulphate 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 sol (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.	P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
PO4-DO-COL-EDWaterDiss. Orthophosphate in Water by ColourAPHA 4500-P PHOSPHORUSThis 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.Dissolved Orthophosphate is determined through a 0.45 micron membrane filter.TSS-CLWaterTotal Suspended SolidsAPHA 2540 D-GravimetricThis analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended sol (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.	This analysis is o persulphate dige	carried out using proce stion of the sample.	dures adapted from APHA Method 4500-P "Ph	osphorus". Total Phosphorus is determined colourimetrically after
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 sol (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.	PO4-DO-COL-EI	D Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
TSS-CLWaterTotal Suspended SolidsAPHA 2540 D-GravimetricThis analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended sol(TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.	This analysis is o colourimetrically	carried out using proce on a sample that has l	dures adapted from APHA Method 4500-P "Ph peen lab or field filtered through a 0.45 micron	osphorus". Dissolved Orthophosphate is determined membrane filter.
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended sol (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.	TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
	This analysis is o (TSS) are detern	carried out using proce nined by filtering a sam	dures adapted from APHA Method 2540 "Solid ple through a glass fibre filter, and by drying the through a glass fibre filter.	ls". Solids are determined gravimetrically. Total suspended solids le filter at 104 deg. C.
ALS test methods may incorporate modifications from specified reference methods to improve performance.	ALS test metho	ds may incorporate mo	difications from specified reference methods to	o improve performance.

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

Reference Information

L2082692 CONTD.... PAGE 5 of 5 Version: FINAL REV

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



				Quant	y control	Report			
			Workorder:	L208269	2 Re	eport Date: 07-I	MAR-19	Pa	ge 1 of 3
Client:	KICKING 1505 - 17 CALGAR	HORSE MOUNT Th AVENUE SW Y AB T2T 0E2	AIN UTILITY CC	ORPORATIC	DN				
		Matrix	Poforonco	Posult	Qualifier	Unite	PPD	Limit	Analyzed
Test		Watrix	Reference	Result	Quaimer	onits	KF D	Linint	Analyzeu
BOD-BC-CL		Water							
Batch R	4023099								
WG2758664-2 Biochemical C	LCS Dxygen De	mand		85.4		%		85-115	20-APR-18
WG2758664-1 Biochemical C	MB Dxygen De	mand		<2.0		mg/L		2	20-APR-18
EC-MPN-CL		Water							
Batch R	4020048								
WG2756378-1	MB								
MPN - E. coli				<1		MPN/100mL		1	20-APR-18
FCC-MF-CL		Water							
Batch R	4020067								
WG2756382-1	МВ								
Coliform Bacte	eria - Feca	al		<1		CFU/100mL		1	20-APR-18
NH3-F-CL	4000055	water							
WG2757703-4	4022255								
Ammonia, Tot	al (as N)			101.9		%		85-115	24-APR-18
WG2757703-1	МВ								
Ammonia, Tot	al (as N)			<0.050		mg/L		0.05	24-APR-18
NO2-IC-N-CL		Water							
Batch R	4022150								
WG2757584-3	DUP		L2082692-2	~0.010		mal	NI/A	20	
WG2757584-2	1.05		<0.010	<0.010	KFD-NA	iiig/L	IN/A	20	20-APR-16
Nitrite (as N)	200			108.8		%		90-110	20-APR-18
WG2757584-1	МВ								
Nitrite (as N)				<0.010		mg/L		0.01	20-APR-18
WG2757584-4	MS		L2082692-2			0/			
Ninte (as N)				115.4		%		75-125	20-APR-18
NO3-IC-N-CL		Water							
Batch R	4022150								
wG2/5/584-3 Nitrate (as N)	DON		L2082692-2 0.128	0.124		mg/L	2.9	20	20-APR-18
WG2757584-2	LCS					-			
Nitrate (as N)				103.6		%		90-110	20-APR-18
WG2757584-1	MB								



	Workorder:	L2082692	Report Date: 07-MAR-19	Pag	e 2 of 3
Test Ma	trix Reference	Result Qualifier	Units RPD	Limit	Analyzed
NO3-IC-N-CL Wa	ater				
Batch R4022150 WG2757584-1 MB Nitrate (as N)		<0.020	mg/L	0.02	20-APR-18
WG2757584-4 MS Nitrate (as N)	L2082692-2	111.0	%	75-125	20-APR-18
P-T-COL-ED Wa	ater				
Batch R4023846		_			
Phosphorus (P)-Total	KONELAB_II	101.1	%	80-120	26-APR-18
WG2758693-5 MB Phosphorus (P)-Total		<0.020	mg/L	0.02	26-APR-18
PO4-DO-COL-ED Wa	ater				
Batch R4019369 WG2756126-2 LCS Orthophosphate-Dissolved (a	as P)	105.6	%	70-130	21-APR-18
WG2756126-4 LCS Orthophosphate-Dissolved (a	as P)	109.9	%	70-130	21-APR-18
WG2756126-1 MB Orthophosphate-Dissolved (a	as P)	<0.010	mg/L	0.01	21-APR-18
WG2756126-3 MB Orthophosphate-Dissolved (a	as P)	<0.010	mg/L	0.01	21-APR-18
TSS-CL Wa	ater				
Batch R4022864 WG2758306-2 LCS Total Suspended Solids		95.1	%	85-115	25-APR-18
WG2758306-1 MB Total Suspended Solids		<3.0	mg/L	3	25-APR-18

Workorder: L2082692

Report Date: 07-MAR-19

Legend:

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

Sample Parameter Qualifier Definitions:

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

Hold Time Exceedances:

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

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against 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.



Enterococcus Test Results

Samples collected April 19, 2018

Final Report

April 27, 2018

Submitted to:

1.15

ALS Laboratory Group Calgary, AB

100

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



SAMPLE INFORMATION

Sample ID/			Dates	Receipt	
Internal ID	Collected	Received	Enterococcus test initiation	temperature	
L2082692-1 WWTP EFFLUENT – UV TROUGH/ 1718-0982-01	19-Apr-18 at 1400h	20-Apr-18 at 1125h	20-Apr-18 at 1200h	9°C	
L2082692-2 COLUMBIA RIVER UPSTREAM/ 1718-0982-02	19-Apr-18 at 1500h	20-Apr-18 at 1125h	20-Apr-18 at 1200h	9°C	
L2082692-3 COLUMBIA RIVER DOWN STREAM/ 1718-0982-03	19-Apr-18 at 1500h	20-Apr-18 at 1125h	20-Apr-18 at 1200h	9°C	
L2082692-4 COLUMBIA RIVER SIDE CHANNEL/ 1718-0982-04	19-Apr-18 at 1500h	20-Apr-18 at 1125h	20-Apr-18 at 1200h	9°C	

TEST TYPES

Enterococcus enumeration test

RESULTS

Microbial test results

Comple ID	MPN/100 mL	
Sample ID	Enterococcus	
L2082692-1 WWTP EFFLUENT – UV TROUGH	1.0	
L2082692-2 COLUMBIA RIVER UPSTREAM	2.0	
L2082692-3 COLUMBIA RIVER DOWN STREAM	1.0	
L2082692-4 COLUMBIA RIVER SIDE CHANNEL	2.0	

MPN = Most Probable Number



QA/QC

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



stil

Destalard

Report By: Courtney Bogstie, BSc Biologist

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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



APPENDIX A – Test data

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Quanti-Tray Bench Sheet - Enterococcus

est Initiation Date: <u>2015 (04120</u> Time: <u>1200</u> Techician: <u>20</u>	111	Reagent	agent used: Lot#/Expiry:	EN52	8/May 18,2018	Sample Information Dilution Factor Comments:
Thermometer Serial #: 10.09.034.75 Incubator #: 1 Another Temperature: 41.00 Incubator Temperature: 41.00		Quant	I Tray 2000 I	.ot#/Expiry:	GALCATI C21	02020
esults - 24 Hour Incubation Date: <u>2018/04/21</u> Tin	15. 120C			Technician	TC	
Incubator Temp: <u></u>	Ē	0-	-02	3	interococci (Fluorescent - 04-	
Positive Large Wells:	0	-	2	1	8	
Ambiguous Large Wells:	0	0	0	0	0	
Positive Small Wells (Tray 2000 only):	0	0	0	0	0	
Ambiguous Smail Wells (Tray 2000 only):	0	0	0	C	C	
lost Probable Number at 24 hours:	17	0.1	0.1	0	2.0	-
esults - 28 Hour Incubation Date:	le:			Technician		
Incubator Temp: (must be 41 ± 0.5°C)	៩				interococci (Fluorescent	
Confirmed Positive Large Wells:						
Confirmed Positive Small Wells (Tray 2000 only):						
loct Prohable Number at 28 hours:						

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

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

Nautilus Environmental (Calgary)


APPENDIX B – Chain-of-custody form



Subcontract Request Form

L2082692

CALGARY

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

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

NOTES: Please reference on final report and invoice: PO# <u>L2082692</u> ALS requires QC data to be provided with your final results.

Please see enclosed <u>4</u> sample(s) in <u>4</u> Container(s)

SAMPLE NUMBER ANAL	YTICAL REQUIRED	DATE SAMPLED	Priority Flag
L2082692-1 WWTP EFFLUENT - U	v	4/ 19/2018 19:00)
1718-0982-01 Enter	ococcus (ENTERO-HQ 1)	4/27/2018	
L2082692-2 COLUMBIA RIVER		4/19/2018 15:00	
1713-0982-02 Enter	DCOCCUS (ENTERO-HQ 1)	4/27/2018	
L2082692-3 COLUMBIA RIVER DO	WN	4/ 19/ 2018 15:00)
1718 -0952 -03 Enter	ococcus (ENTERO-HQ 1)	4/27/2018	
L2082692-4 COLUMBIA RIVER SI CHANNEL	DE	4/19/2018 15:00	d
1718-0982-04 Enter	ococcus (ENTERO-HQ 1)	4/27/2018	
Subcontract Info Contact: Analysis and reporting info contac	John Forbes (403) 291-9897 t: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897	COL Doblow(NO 1125 No 5 SI Email: Nancy. Sonompil@als	4 x 250nL gail Cardition Jazoo gec global.com
Please email confirmation of re	eceipt to: Nancy.Sonom	pil@alsglobal.com	
Shipped By:	Date Shipped:		
Received By:	Date Received		
Verified By:	Date Verified:		
	Temperature:		
Sample Integrity Issues:			



END OF REPORT





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

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

Report To			ormat / Distributi	ion		Serv	ice R	eque	sted	(Rush	for rou	utine a	nalysi	s subie	ect to a	availal	bility)	
Company:	Kicking Horse Mountain Resort Utility Corporation	Standard Other				Regular (Standard Turnaround Times - Business Days)												
Contact:	Travis Jobin	POF	PDF Excel Digital Fax O Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm						onfirm	TAT								
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickingh	orseresort.com		O En	nergen	y (1-2	Bus, D	ays) -	100% :	Surchar	ge - Co	intact A	LS to Confirm TAT			
		Email 2: pmajer@skircr.com O Same Day or Weekend Emergency - Contact ALS to Confir					rm TAT		-									
Phone:	250-344-8442 Fax:	Email 3: mskyring@kickinghorseresort.com Analysis Request																
Invoice To	Same as Report ? 🗌 Yes 🚺 No	Client / Pr	roject Informatic	on 🛛	-	Ple	ase i	ndica	te bel	ow Fi	ltered	, Pres	erved	l or be	oth (F	, P, F	7P)	
Hardcopy of I	nvoice with Report? 🔲 Yes 🗹 No	Job #:	WEEK - 2018 S	Spring EMS pro	gram													
Company:	Resorts of the Canadian Rockies	PO / AFE:																
Contact:	Patrick Majer	LSD:																
Address:	1505 - 17th Ave SW Calgary AB																	ers
Phone:	· Fax:	Quote #:	WW - Q33059															tair
Lab V	Vork Order #	ALS			TUDAO	1							ε					l S
(lab	o use only)	Contact:	L3	Sampler:	TJ/PAG								olifo	g				r of
Sample	Sample Identification	•	Date	Time	Sample Type	ß	ഗ	H4	ğ	62	alP	Po P	Sal C	eroc	ie Co			mbe
#	(This description will appear on the report)		(dd-mmm-yy)	(hh:mm)		8	TS.	ź	ź	Ż	1 Tot	ð	Тę	Ц	ū			Ž
	WWTP Effluent - UV trough Temp: 1 pH:8.7		19-Apr-18	14:00	Water	X	Х	Х	X	X	X	X	X	X	Х			5
. 203	Columbia River Upstream Temp: 8,5 pH: 7,8		19-Apr-18	15:00	Water		Х	X	X	X	X	X	X	X	X			4
	Columbia River Down stream Temp: 9, () pH: 7.8		19-Apr-18	15:00	Water		X	X	X	Х	X	X	X	X	X			4
	Columbia River Side Channel Temp.9, 7 pH: 7,8		19-Apr-18	15:00	Water		Х	X	X	X	X	X	Х	X	X		١	4
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	Special Instructions / Regulations with water or lar	nd use (CCM	AE-Freshwater A	quatic Life/BC	CSR - Commerci	al/AB	Tier	1 - Na	atural	, etc)	/ Haz	zardo	us De	tails			I	<u> </u>
Please return	fresh bottles for next weeks sampling- Thanks	<u> </u>																
	Failure to complete a	Il portions o	of this form may	delay analysis	Please fill in thi	s form	n LEO	SIBLY	′. 		- 1 4 - 1-							
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Enterococcus Test Results

Samples collected April 19, 2018

Final Report

April 27, 2018

Submitted to:

1.15

ALS Laboratory Group Calgary, AB

100

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



SAMPLE INFORMATION

Sample ID/		Receipt		
Internal ID	Collected	Received	Enterococcus test initiation	temperature
L2082692-1 WWTP EFFLUENT – UV TROUGH/ 1718-0982-01	19-Apr-18 at 1400h	20-Apr-18 at 1125h	20-Apr-18 at 1200h	9°C
L2082692-2 COLUMBIA RIVER UPSTREAM/ 1718-0982-02	19-Apr-18 at 1500h	20-Apr-18 at 1125h	20-Apr-18 at 1200h	9°C
L2082692-3 COLUMBIA RIVER DOWN STREAM/ 1718-0982-03	19-Apr-18 at 1500h	20-Apr-18 at 1125h	20-Apr-18 at 1200h	9°C
L2082692-4 COLUMBIA RIVER SIDE CHANNEL/ 1718-0982-04	19-Apr-18 at 1500h	20-Apr-18 at 1125h	20-Apr-18 at 1200h	9°C

TEST TYPES

Enterococcus enumeration test

RESULTS

Microbial test results

Comple ID	MPN/100 mL	
Sample ID	Enterococcus	
L2082692-1 WWTP EFFLUENT – UV TROUGH	1.0	
L2082692-2 COLUMBIA RIVER UPSTREAM	2.0	
L2082692-3 COLUMBIA RIVER DOWN STREAM	1.0	
L2082692-4 COLUMBIA RIVER SIDE CHANNEL	2.0	

MPN = Most Probable Number



QA/QC

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



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Destalard

Report By: Courtney Bogstie, BSc Biologist

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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



APPENDIX A – Test data

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Quanti-Tray Bench Sheet - Enterococcus

est Initiation Date: <u>2018 (04120</u> Time: <u>1200</u> Techician: <u>20</u>	111	Re Reagent l	agent used: .ot#/Expiry:	ENEROLER	8/ May 18,2015	Sample Information Dilution Factor: Comments:
hermometer Serial #: <u>16.09.034.75</u> Incubator #: <u>1</u> Incubator Temperature: <u>41.0</u> (must be 41 ± 0.5°C)	111	Quanti	Tray 2000 I	.ot#/Expiry	GALCATI CU	0/2020
esults - 24 Hour Incubation Date: <u>2018/04/21</u> Tin	e: 1200			Technician	70	
Incubator Temp: 41.0 (must be 41 ± 0.5°C)	6	0-	-02	181	interococci (Fluorescen - 04-	Q
Positive Large Wells:	0	-	2	1	8	
Ambiguous Large Wells:	0	0	0	0	0	
Positive Small Wells (Tray 2000 only):	0	0	0	0	0	
Ambiguous Smail Wells (Tray 2000 only):	0	0	0	C	C	
lost Probable Number at 24 hours:	17	0.1	2.0	0	2.0	
esults - 28 Hour Incubation Date:	ie:			Technician		
Incubator Temp: (must be 41 ± 0.5°C)	ដ				i nterococci (Fluorescen	0
Confirmed Positive Large Wells:						
Confirmed Positive Small Wells (Tray 2000 only):						
lost Prohahle Number at 28 hours:						

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

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

Nautilus Environmental (Calgary)



APPENDIX B – Chain-of-custody form



Subcontract Request Form

L2082692

CALGARY

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

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

NOTES: Please reference on final report and invoice: PO# <u>L2082692</u> ALS requires QC data to be provided with your final results.

Please see enclosed <u>4</u> sample(s) in <u>4</u> Container(s)

SAMPLE NUMBER ANAL	YTICAL REQUIRED	DATE SAMPLED	Priority Flag
L2082692-1 WWTP EFFLUENT - U	v	4/ 19/2018 19:00)
1718-0982-01 Enter	ococcus (ENTERO-HQ 1)	4/27/2018	
L2082692-2 COLUMBIA RIVER		4/19/2018 15:00	
1713-0982-02 Enter	DCOCCUS (ENTERO-HQ 1)	4/27/2018	
L2082692-3 COLUMBIA RIVER DO	WN	4/ 19/ 2018 15:00)
1718 -0952 -03 Enter	ococcus (ENTERO-HQ 1)	4/27/2018	
L2082692-4 COLUMBIA RIVER SI CHANNEL	DE	4/19/2018 15:00	d
1718-0982-04 Enter	ococcus (ENTERO-HQ 1)	4/27/2018	
Subcontract Info Contact: Analysis and reporting info contac	John Forbes (403) 291-9897 t: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897	COL Doblow(NO 1125 No 5 SI Email: Nancy. Sonompil@als	4 x 250nL gail Cardition Jazoo gec global.com
Please email confirmation of re	eceipt to: Nancy.Sonom	pil@alsglobal.com	
Shipped By:	Date Shipped:		
Received By:	Date Received		
Verified By:	Date Verified:		
	Temperature:		
Sample Integrity Issues:			



END OF REPORT



KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received:26-APR-18Report Date:07-MAR-19 10:59 (MT)Version:FINAL REV. 2

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2085234 Project P.O. #: NOT SUBMITTED Job Reference: WEEK 2-2018 SPRING 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

Environmental 🕽

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: T I/MS on 25-APR-18 @ 14:00							
Maria Mari							
Ammonia. Total (as N)	<0.050		0.050	ma/l		01-MAY-18	R4030249
Biochemical Oxygen Demand	<20		2.0	ma/l		27-APR-18	R4031061
Orthophosphate-Dissolved (as P)	0 238		0.010	ma/l		27-APR-18	R4024331
Enterococcus	See Attached		0.010			26-APR-18	R4036327
Coliform Bacteria - Fecal	<1		1	CFU/100ml		26-APR-18	R4024495
MPN - F. coli	<1		1	MPN/100ml		26-APR-18	R4024480
Phosphorus (P)-Total	0 351		0 020	ma/l	02-MAY-18	03-MAY-18	R4032514
Total Suspended Solids	4 7		3.0	ma/l	02 100 110	01-MAY-18	R4030914
NO2. NO3 and Sum of NO2/NO3	4.7		0.0	ing/E		01100110	114030314
Nitrate in Water by IC							
Nitrate (as N)	8.57		0.020	mg/L		28-APR-18	R4031083
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	8.60		0.050	mg/L		02-MAY-18	
Nitrite in Water by IC							
Nitrite (as N)	0.027		0.010	mg/L		28-APR-18	R4031083
L2085234-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/MS on 25-APR-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		01-MAY-18	R4030249
Orthophosphate-Dissolved (as P)	0.027		0.010	mg/L		27-APR-18	R4024331
Enterococcus	See Attached					26-APR-18	R4036327
Coliform Bacteria - Fecal	83		1	CFU/100mL		26-APR-18	R4024495
MPN - E. coli	36	OCR	1	MPN/100mL		26-APR-18	R4024480
Phosphorus (P)-Total	<0.020		0.020	mg/L	02-MAY-18	03-MAY-18	R4032514
Total Suspended Solids	17.3		3.0	mg/L		01-MAY-18	R4030914
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	0.405						D 400 4000
	0.105		0.020	mg/L		28-APR-18	R4031083
Nitrate+Nitrite Nitrate and Nitrite (as N)	0 105		0.050	ma/l		02-MAY-18	
Nitrite in Water by IC	0.105		0.000	iiig/L		02 10 4 1 10	
Nitrite (as N)	<0.010		0.010	mg/L		28-APR-18	R4031083
L2085234-3 COLUMBIA RIVER DOWN STRFAM							
Sampled By: TJ/MS on 25-APR-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		01-MAY-18	R4030249
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		27-APR-18	R4024331
Enterococcus	See Attached			0		26-APR-18	R4036327
Coliform Bacteria - Fecal	31		1	CFU/100mL		26-APR-18	R4024495
MPN - E. coli	6	OCR	1	MPN/100mL		26-APR-18	R4024480
Phosphorus (P)-Total	0.020		0.020	ma/L	02-MAY-18	03-MAY-18	R4032514
Total Suspended Solids	24.0		3.0	ma/L		01-MAY-18	R4030914
NO2, NO3 and Sum of NO2/NO3			0.0				
Nitrate in Water by IC							
Nitrate (as N)	0.112		0.020	mg/L		28-APR-18	R4031083
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.112		0.050	mg/L		02-MAY-18	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2085234-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 25-APR-18 @ 15:00							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		28-APR-18	R4031083
L2085234-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: IJ/MS on 25-APR-18 @ 15:00							
Matrix: WATER Miscellaneous Parameters							
Ammonia. Total (as N)	<0.050		0.050	ma/l		01-MAY-18	R4030249
Orthophosphate-Dissolved (as P)	<0.010		0.000	mg/L		27-APR-18	R4024331
Enterococcus	See Attached			5		26-APR-18	R4036327
Coliform Bacteria - Fecal	37		1	CFU/100mL		26-APR-18	R4024495
MPN - E. coli	26	OCR	1	MPN/100mL		26-APR-18	R4024480
Phosphorus (P)-Total	<0.020		0.020	mg/L	02-MAY-18	03-MAY-18	R4032514
Total Suspended Solids	14.7		3.0	mg/L		01-MAY-18	R4030914
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	0.004		0.020	ma/l		28-APP-18	P4021092
	0.094		0.020	iiig/ L		20 AI IV 10	114031003
Nitrate and Nitrite (as N)	0.094		0.050	mg/L		02-MAY-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		28-APR-18	R4031083

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description		
MS-B	Matrix Spike recovery	y could not be accurately calculated due to high	n analyte background in sample.
OCR	Parameter is out of c	lient specific range.	
est Method R	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is oxygen demand dissolved oxyge BOD (CBOD) is	carried out using proce (BOD) are determined n meter. Dissolved BO determined by adding	edures adapted from APHA Method 5210B - "Bi by diluting and incubating a sample for a spec D (SOLUBLE) is determined by filtering the sar a nitrification inhibitor to the diluted sample price	ochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a mple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
EC-MPN-CL	Water	MPN - E. coli	APHA 9223B
This analysis is Substrate Colifo sample is mixed The packet is in response are co probability table. Recommended Sample: 1 day Reference: APH	carried out using proce orm Test". E. coli and To d with a mixture hydroly cubated for 18 or 24 ho ounted. The final result Holding Time:	edures adapted from APHA Method 9223 "Enzy otal Coliform are determined simultaneously. T zable substrates and then sealed in a multi-wel ours and then the number of wells exhibiting a p is obtained by comparing the positive response	rme he II packet. positive es to a
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is Coliform bacteria involves an initia bacteria (Fecal)	carried out using proce a is enumerated by cul al 24 hour incubation at and is used for non-tur	edures adapted from APHA Method 9222 "Mem turing and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriate bid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". olume is filtered through a 0.45 micron membrane filter. The test e growth medium. This method is specific for thermotolerant
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is of Chemistry, "F al.	carried out, on sulfuric low-injection analysis v	acid preserved samples, using procedures moves with fluorescence detection for the determination	dified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society n of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	s are analyzed by Ion C	Chromatography with conductivity and/or UV de	tection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	s are analyzed by Ion C	Chromatography with conductivity and/or UV de	tection.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate dige	carried out using proce estion of the sample.	edures adapted from APHA Method 4500-P "Ph	osphorus". Total Phosphorus is determined colourimetrically after
PO4-DO-COL-E	D Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using proce on a sample that has	edures adapted from APHA Method 4500-P "Ph been lab or field filtered through a 0.45 micron	osphorus". Dissolved Orthophosphate is determined membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is (TSS) are deterr	carried out using proce mined by filtering a san	edures adapted from APHA Method 2540 "Solid nple through a glass fibre filter, and by drying th	ls". Solids are determined gravimetrically. Total suspended solids he filter at 104 deg. C.
* ALS test metho	ods may incorporate mo	odifications from specified reference methods to	o improve performance.
The last two lette	ers of the above test co	ode(s) indicate the laboratory that performed an	nalytical analysis for that test. Refer to the list below:
Laboratory Defi	inition Code Labo	pratory Location	

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

Chain of Custody Numbers:

Reference Information

L2085234 CONTD.... PAGE 5 of 5 Version: FINAL REV

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**	
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GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



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			Qualit	y Conti	fol Report			
		Workorder:	L2085234	Ļ	Report Date: 07	7-MAR-19	Pa	ige 1 of 3
Client: Contact:	KICKING HORSI 1505 - 17th AVE CALGARY AB TRAVIS JOBIN	E MOUNTAIN UTILITY C ENUE SW T2T 0E2	ORPORATIO	Ν				
Test	Matrix	x Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	Wate	r						
Batch WG2763502- Biochemical	R4031061 2 LCS Oxygen Demand		96.0		%		85-115	27-APR-18
WG2763502- Biochemical	1 MB Oxygen Demand		<2.0		mg/L		2	27-APR-18
EC-MPN-CL	Wate	r						
Batch WG2760357- MPN - E. col	R4024480 4 MB i		<1		MPN/100mL		1	26-APR-18
FCC-MF-CL	Wate	r						
Batch WG2760373- Coliform Bac	R4024495 1 MB cteria - Fecal		<1		CFU/100mL		1	26-APR-18
NH3-F-CL	Wate	r						
Batch	R4030249							
WG2762563- Ammonia, Te	10 LCS otal (as N)		96.4		%		85-115	01-MAY-18
WG2762563- Ammonia, To	6 LCS otal (as N)		101.2		%		85-115	01-MAY-18
WG2762563-	5 MB							01 100 10
Ammonia, To	otal (as N)		<0.050		mg/L		0.05	01-MAY-18
WG2762563- Ammonia, To	9 MB otal (as N)		<0.050		mg/L		0.05	01-MAY-18
NO2-IC-N-CL	Wate	r						
Batch WG2763499- Nitrite (as N)	R4031083 2 LCS		105.3		%		90-110	28-APR-18
WG2763499- Nitrite (as N)	1 MB		<0.010		mg/L		0.01	28-APR-18
NO3-IC-N-CL	Wate	r						
Batch	R4031083							
WG2763499- Nitrate (as N	2 LCS		101.0		%		90-110	28-APR-18
WG2763499- Nitrate (as N	1 MB)		<0.020		mg/L		0.02	28-APR-18

P-T-COL-ED

Water



Quality Control Report

	Workorder: L	2085234	Report Date: 07-MAF	R-19 Pa	ge 2 of 3
Test Matrix	Reference	Result Qualifier	r Units F	RPD Limit	Analyzed
P-T-COL-ED Water					
Batch R4032514					
WG2763557-2 LCS	KONELAB_TP				
Phosphorus (P)-Total		99.5	%	80-120	03-MAY-18
WG2763557-1 MB					
Phosphorus (P)-Total		<0.020	mg/L	0.02	03-MAY-18
PO4-DO-COL-ED Water					
Batch R4024331					
WG2760219-2 LCS					
Orthophosphate-Dissolved (as P)		105.7	%	70-130	27-APR-18
WG2760219-4 LCS					
Orthophosphate-Dissolved (as P)		113.6	%	70-130	27-APR-18
WG2760219-6 LCS			04		
Orthophosphate-Dissolved (as P)		109.5	%	70-130	27-APR-18
WG2760219-1 MB		0.040			
Orthophosphate-Dissolved (as P)		<0.010	mg/L	0.01	27-APR-18
WG2760219-3 MB		-0.010	ma/l	0.04	
		<0.010	mg/∟	0.01	27-APR-18
WG2760219-5 MB Orthophosphate-Dissolved (as P)		~0.010	ma/l	0.01	
Onnophosphale-Dissolved (as 1)		<0.010	mg/∟	0.01	27-APR-10
TSS-CL Water					
Batch R4030914					
WG2762605-2 LCS		- <i>i</i> -	<i></i>		
I otal Suspended Solids		94.7	%	85-115	01-MAY-18
WG2762605-1 MB					
Total Suspended Solids		<3.0	mg/L	3	01-MAY-18

Workorder: L2085234

Report Date: 07-MAR-19

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.



Microbial Test Results

Samples collected April 25, 2018

Final Report

May 7, 2018

Submitted to: ALS Environmental Calgary, AB

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



SAMPLE INFORMATION

		Dates		Dessint
Internal ID	Collected	Received	Enterococcus test initiation	temperature
L2085234-1 WWTP EFFLUENT – UV TROUGH/	25-Apr-18 at 1400h	26-Apr-18 at 1120h	26-Apr-18 at 1245h	10°C
1718-1009-01				
L2085234-2 COLUMBIA RIVER UPSTREAM/ 1718-1009-02	25-Apr-18 at 1500h	26-Apr-18 at 1120h	26-Apr-18 at 1245h	10°C
L2085234-3 COLUMBIA RIVER DOWN STREAM/ 1718-1009-03	25-Apr-18 at 1500h	26-Apr-18 at 1120h	26-Apr-18 at 1245h	10°C
L2085234-4 COLUMBIA RIVER SIDE CHANNEL/	25-Apr-18 at 1500h	26-Apr-18 at 1120h	26-Apr-18 at 1245h	10°C
1718-1009-04				

TEST TYPES

Enterococcus enumeration test

RESULTS

Microbial test results

6 J ID	MPN/100 mL				
Sample ID	Enterococcus				
L2085234-1 WWTP EFFLUENT – UV TROUGH	1.0				
L2085234-2 COLUMBIA RIVER UPSTREAM	16.8				
L2085234-3 COLUMBIA RIVER DOWN STREAM	7.2				
L2085234-4 COLUMBIA RIVER SIDE CHANNEL	9.4				

MPN = Most Probable Number



QA/QC

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



Destalaret

istio

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

Report By: Courtney Bogstie, BSc Biologist

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

REFERENCES

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

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



APPENDIX A – Test data

Client	Tonfirmed positive wells includes the positive wells from 24 h At 28 hours only score marked ambiguos from 24 hours	Most Probable Number at 28 hours:	Confirmed Positive Small Wells (Tray 2000 only):	Confirmed Positive Large Wells:	Incubator Temp: (must be 41 ± 0.5°C)	tesults - 28 Hour Incubation Date:	Most Probable Number at 24 hours:	Ambiguous Small Wells (Tray 2000 only):	Positive Small Wells (Tray 2000 only):	Ambiguous Large Wells:	Incubator Temp: <u>UL</u> (must be 41 ± 0.5°C)	tesults - 24 Hour Incubation Date: 2018/04/23 Time:	Thermometer Serial #: $16090347S$ Incubator #: 7 ncubator Temperature: $41^{o}C$ (must be $41 \pm 0.5^{\circ}C$)	rest Initiation Date: <u>2018/IO4/IZ6</u> Time: <u>12.4S</u> Techician: <u>18</u>		G NAUTILUS ENVIRONMENTAL
	ours plus the ambiguous wells that became positive at 28 nours Nautilus Environmental (Calgary)				CTL Enterococci (Fluorescent)	Technician:	<1 1.0 168 772 194 1		004734		CTL 1718-1009 1718-1009 Enterococci (Fluorescent)	ROD Technician: W	Quanti Tray 2000 Lot#/Expiry:/ 10/07	Reagent used: Enterolert [™] Dilution Factor Reagent Lot#/Expiry: ENS28118 WAY 2018 Comments:	Client <u>ALS 106</u> Reference 17	Quanti-Tray Bench Sheet - En

F106

Revised by LO on 2015/07/09



APPENDIX B – Chain-of-custody form



Subcontract Request Form

L2085234

CALGARY

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

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

Please see enclosed <u>4</u> sat	mple(s) in <u>4</u> Container(s)	
SAMPLE 17 NUMBER ANALYT	18-1009 ICAL REQUIRED	DATE SAMPLED Priority DUE DATE Flag
L2085234-1 WWTP EFFLUENT - UV TROUGH Enteroco	ccus (ENTERO-HQ 1) — 🔿 (l 4/25/2018 € 14:00 5/3/2018
L2085234-2 COLUMBIA RIVER UPSTREAM Enteroco	ссия (ENTERO-HQ 1) — 02	2 4/25/2018 @ > S= 13 5/3/2018
L2085234-3 COLUMBIA RIVER DOW STREAM Enteroco	N CCUS (ENTERO-HQ 1) - O	3 41 251 2018 @ 15=03 5/3/2018
L2085234-4 COLUMBIA RIVER SIDE		11412512018 @ 15-W
CHANNEL	ccus (ENTERO-HQ 1) - O	5/3/2018
CHANNEL Enteroco Subcontract Info Contact: Analysis and reporting info contact:	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE	5/3/2018
CHANNEL Enteroco Subcontract Info Contact: Analysis and reporting info contact:	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897	Email: Nancy.Sonompil@alsglobal.com
CHANNEL Enteroco Subcontract Info Contact: Analysis and reporting info contact: Please email confirmation of reco	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 eipt to: Nancy.Sonompi	Email: Nancy.Sonompil@alsglobal.com
CHANNEL Enteroco Subcontract Info Contact: Analysis and reporting info contact: Please email confirmation of reco Shipped By: DCOPOFF	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 eipt to: Nancy.Sonompi	Email: Nancy. Sonompil@alsglobal.com il@alsglobal.com
CHANNEL Enteroco	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 eipt to: Nancy.Sonompi Date Shipped: Date Received:	Email: Nancy. Sonompil@alsglobal.com il@alsglobal.com $4 \times 200MLBotz$ 2018/04/26 11;



END OF REPORT

Chain of Custody / Analytical Request Form Canada Toll Free: 1 800 668 9878



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ALSE	Environmental		<u>www</u>	alsglobal.com/				11 11 1								1	·1
Report To		Report For	rmat / Distribu	ution		Servic L2065234-COFC					- r	rity)					
Company:	Kicking Horse Mountain Resort Utility Corporation	Standard	Other			🖲 Re	— gular (S	jular (Standard) umaround i pinca - Secure -									
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@kicking	horseresort.com		⊖ Err	nergeno	rgency (1-2 Bus, Days) - 100% Surcharge - Contact ALS to Confirm TAT							AT		
		Email 2:	Email 2: pmajer@skircr.com O Same Day or Weekend Emergency - Contact ALS to Confirm TAT														
Phone:	250-344-8442 Fax:	Email 3:	Email 3: <u>mskyring@kickinghorseresort.com</u> Analysis Request														
Invoice To	Same as Report ? 🗌 Yes 🔄 No	Client / Pro	oject Informat	tion		Ple	ase ir	ndicat	te bel	ow Fil	tered	, Pres	serve	d or b	oth (F	, P, F/F	')
Hardcopy of I	nvoice with Report? Ses Sec. No	Job #:	Week - 2018	Spring EMS prog	jram - WW									-			
Company:	Resorts of the Canadian Rockies	PO / AFE:														T	
Contact:	Patrick Majer	LSD:															
Address:	1505 - 17th Ave SW Calgary AB																lers
Phone:	Fax:	Quote #:															Itair
Lab V	Vork Order #	ALS	10	Complete	TUMO	1							E				S.
(lab	use only)	Contact:	19	Sampler:	TJ/MS								E I	j (j			đ
Sample	Sample Identification	•	Date	Time	O amonto T	1 2		Ŧ	8	5	۲ ۲	L L L	ŭ a	ļğ	.⊟		hbe
#	(This description will appear on the report	t)	(dd-mmm-yy)	(hh:mm)	Sample Type	B	TSS	z z	N-N	N-N	Tota	l ŧ	Lec	E E	о ш		Nu l
1	WWTP Effluent - UV trough Temp: 9,2 pH: 6	8	APR25	2PM	Water	Х	Х	Х	Х	Х	Х	х	x	X	X		5
2	Columbia River Upstream Temp: 12 pH: 7	e l		3PM	Water		х	Х	X	X	Х	X	X	X	X		4
3	Columbia River Down stream Temp: 12 pH: 1	<i>,</i> 8		3PM	Water		Х	Х	X	Х	Х	x	X	X	X		4
4	Columbia River Side Channel Temp: 129 pH: 7.	ø		JPM	Water		Х	х	X	Х	Х	х	X	X	X		4
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	Special Instructions / Regulations with water of	r land use (CCM	E-Freshwater	Aquatic Life/BC	CSR - Commerci	al/AB	Tier 1	I - Na	itural	, etc)	/ Haz	ardo	us De	etails			
			" <u> </u>														
	Failure to complet	te all portions of	this form ma	y delay analysis.	Please fill in thi	s form	LEG	IBLY									
	By the use of this form the user a	acknowledges ar	nd agrees wit	h the Terms and	Conditions as pr	ovide	dona	a sep	arate	Exce	el tab),	m	anato			
	SHIPMENT RELEASE (client use)	SHIDA	MENT RECEP	TION (Jab use only	v)	T	iri / MC	olain ei	y ume HIPM	E CADI	e 10f /EDI			anaiy (lah u	ses.	<u></u>	
Released by:	Date (dd-mmm-yy) Time (hh-mm) Rece	eived by:	Date:	Time:	Temperature:	Verif	ied by	01 V:	ar wi	Date			Tim	(ian 0 e:		77 Obsen	vations:
	jele see	lip 1	26 Apr / 18	8:30 AM	10° °C			,.								Yes / N If Yes :	lo ? add SIE
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GENF 20.00 Front



Microbial Test Results

Samples collected April 25, 2018

Final Report

May 7, 2018

Submitted to: ALS Environmental Calgary, AB

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



SAMPLE INFORMATION

		Dates		Dessint
Internal ID	Collected	Received	Enterococcus test initiation	temperature
L2085234-1 WWTP EFFLUENT – UV TROUGH/	25-Apr-18 at 1400h	26-Apr-18 at 1120h	26-Apr-18 at 1245h	10°C
1718-1009-01				
L2085234-2 COLUMBIA RIVER UPSTREAM/ 1718-1009-02	25-Apr-18 at 1500h	26-Apr-18 at 1120h	26-Apr-18 at 1245h	10°C
L2085234-3 COLUMBIA RIVER DOWN STREAM/ 1718-1009-03	25-Apr-18 at 1500h	26-Apr-18 at 1120h	26-Apr-18 at 1245h	10°C
L2085234-4 COLUMBIA RIVER SIDE CHANNEL/	25-Apr-18 at 1500h	26-Apr-18 at 1120h	26-Apr-18 at 1245h	10°C
1718-1009-04				

TEST TYPES

Enterococcus enumeration test

RESULTS

Microbial test results

6 J ID	MPN/100 mL				
Sample ID	Enterococcus				
L2085234-1 WWTP EFFLUENT – UV TROUGH	1.0				
L2085234-2 COLUMBIA RIVER UPSTREAM	16.8				
L2085234-3 COLUMBIA RIVER DOWN STREAM	7.2				
L2085234-4 COLUMBIA RIVER SIDE CHANNEL	9.4				

MPN = Most Probable Number


QA/QC

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



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Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

Report By: Courtney Bogstie, BSc Biologist

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

REFERENCES

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

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



APPENDIX A – Test data

Client	Tonfirmed positive wells includes the positive wells from 24 h At 28 hours only score marked ambiguos from 24 hours	Most Probable Number at 28 hours:	Confirmed Positive Small Wells (Tray 2000 only):	Confirmed Positive Large Wells:	Incubator Temp: (must be 41 ± 0.5°C)	tesults - 28 Hour Incubation Date:	Most Probable Number at 24 hours:	Ambiguous Small Wells (Tray 2000 only):	Positive Small Wells (Tray 2000 only):	Ambiguous Large Wells:	Incubator Temp: <u>UL</u> (must be 41 ± 0.5°C)	tesults - 24 Hour Incubation Date: 2018/04/23 Time:	Thermometer Serial #: $16090347S$ Incubator #: 7 ncubator Temperature: $41^{o}C$ (must be $41 \pm 0.5^{\circ}C$)	rest Initiation Date: <u>2018/IO4/IZ6</u> Time: <u>12.45</u> Techician: <u>18</u>		G NAUTILUS ENVIRONMENTAL
	ours plus the ambiguous wells that became positive at 28 nours Nautilus Environmental (Calgary)				CTL Enterococci (Fluorescent)	Technician:	<1 1.0 168 772 194 1		004734		CTL 1718-1009 1718-1009 Enterococci (Fluorescent)	ROD Technician: W	Quanti Tray 2000 Lot#/Expiry:/ 10/07	Reagent used: Enterolert [™] Dilution Factor Reagent Lot#/Expiry: ENS28118 WAY 2018 Comments:	Client <u>ALS 106</u> Reference 1	Quanti-Tray Bench Sheet - En

F106

Revised by LO on 2015/07/09



APPENDIX B – Chain-of-custody form



Subcontract Request Form

L2085234

CALGARY

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

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

Please see enclosed <u>4</u> sat	mple(s) in <u>4</u> Container(s)	
SAMPLE 17 NUMBER ANALYT	18-1009 ICAL REQUIRED	DATE SAMPLED Priority DUE DATE Flag
L2085234-1 WWTP EFFLUENT - UV TROUGH Enteroco	ccus (ENTERO-HQ 1) — 🔿 (l 4/25/2018 € 14:00 5/3/2018
L2085234-2 COLUMBIA RIVER UPSTREAM Enteroco	ссия (ENTERO-HQ 1) — 02	2 4/25/2018 @ > S= 13 5/3/2018
L2085234-3 COLUMBIA RIVER DOW STREAM Enteroco	N CCUS (ENTERO-HQ 1) - O	3 41 251 2018 @ 15=03 5/3/2018
L2085234-4 COLUMBIA RIVER SIDE		11412512018 @ 15-W
CHANNEL	ccus (ENTERO-HQ 1) - O	5/3/2018
CHANNEL Enteroco Subcontract Info Contact: Analysis and reporting info contact:	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE	5/3/2018
CHANNEL Enteroco Subcontract Info Contact: Analysis and reporting info contact:	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897	Email: Nancy.Sonompil@alsglobal.com
CHANNEL Enteroco Subcontract Info Contact: Analysis and reporting info contact: Please email confirmation of reco	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 eipt to: Nancy.Sonompi	Email: Nancy.Sonompil@alsglobal.com
CHANNEL Enteroco Subcontract Info Contact: Analysis and reporting info contact: Please email confirmation of reco Shipped By: DCOPOFF	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 eipt to: Nancy.Sonompi	Email: Nancy.Sonompil@alsglobal.com il@alsglobal.com
CHANNEL Enteroco	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 eipt to: Nancy.Sonompi Date Shipped: Date Received:	Email: Nancy. Sonompil@alsglobal.com il@alsglobal.com $4 \times 200MLBotz$ 2018/04/26 11;



END OF REPORT



KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received: 26-APR-18 Report Date: 08-MAY-18 14:26 (MT) Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2085494 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

Environmental 🕽

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

L208349-1 APRIL 2018 SOLIDS sampled by: L1 on 26-APR-18 (# 14:00 sampled by: L1 on 26-APR-18 (# 14:00 Matrix: OTHER Metals in Soli (CSR) with Extra Metals 0.0059 mg/gg 27-APR-18 28-APR-18 R4024999 Metals in Soli (CSR) with Extra Metals 0.0059 mg/gg 27-APR-18 0 hAW-18 R4024936 Antmony (Sb) 3.81 0.10 mg/gg 27-APR-18 0 hAW-18 R4024936 Antmony (Sb) 3.81 0.10 mg/gg 27-APR-18 0 hAW-18 R4024936 Barum (Ba) 241 0.50 mg/gg 27-APR-18 0 hAW-18 R4024936 Barum (CA) 1613 0.20 mg/gg 27-APR-18 0 hAW-18 R4024936 Barum (Cd) 0.2022 0.020 mg/gg 27-APR-18 0 hAW-18 R4024936 Cadimum (Cd) 0.202 0.020 mg/gg 27-APR-18 0 hAW-18 R4024936 Cadimum (Cd) 0.202 0.026 mg/gg 27-APR-18 0 hAW-18 R4024936 <	Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Laborative Control Contro Control <thcontrol< th=""> <</thcontrol<>								
Control of a function of a function Anticle Charles Refailed	Sampled By: T I on 25-APR-18 @ 14:00							
Metais in Soit (CSR) with Extra Metais Image: Comparison of the CVAAS Recury (in Soit by CVAAS Recurs (in Soit by CVAAS								
Mercary (ns) Solit by CVAS Constraint marks Z7-APR-18 Z9-APR-18 Z9-APR-18 <thz9-zpr-18< th=""></thz9-zpr-18<>	Metals in Soil (CSR) with Extra Metals							
Interaction 0.0619 0.0650 mg/kg 27.4PR-18 28.4PR-18 P4024899 Autimony (M) 31100 50 mg/kg 27.4PR-18 014MA-118 R4024939 Autimony (Sb) 3.81 0.10 mg/kg 27.4PR-18 014MA-118 R4024936 Bartun (Ba) 2.41 0.50 mg/kg 27.4PR-18 014MA-118 R4024936 Bimuth (Bi) 16.3 0.20 mg/kg 27.4PR-18 014MA-118 R4024936 Cadium (Cd) 0.292 0.20 mg/kg 27.4PR-18 014MA-118 R4024936 Cadium (Cd) 0.292 0.20 mg/kg 27.4PR-18 014MA-118 R4024936 Cadium (Cd) 12.27 0.10 mg/kg 27.4PR-18 014MA-118 R4024936 Cober (Ca) 12.7 0.10 mg/kg 27.4PR-18 014MA-18 R4024936 Cober (Ca) 2.36 0.50 mg/kg 27.4PR-18 014MA-18 R4024936 Cober (Ca) 2.7 0.50 <	Mercury in Soil by CVAAS							
Metalsin Soli by CR3 (CPMS The second s	Mercury (Hg)	0.0619		0.0050	mg/kg	27-APR-18	28-APR-18	R4024899
Alumnum (A) 51100 50 mg/kg 27-APR-16 01-MAX-16 R4024936 Antimory (Sb) 3.81 0.10 mg/kg 27-APR-16 01-MAX-16 R4024936 Barium (Ba) 2.41 0.50 mg/kg 27-APR-16 01-MAX-16 R4024936 Born (Ba) 2.61 0.10 mg/kg 27-APR-16 01-MAX-16 R4024936 Born (B) 16.3 0.20 mg/kg 27-APR-16 01-MAX-16 R4024936 Cadium (Ca) 13.6 5.0 mg/kg 27-APR-16 01-MAX-16 R4024936 Cadium (Ca) 16800 5.0 mg/kg 27-APR-16 01-MAX-16 R4024936 Cabati (Ca) 1.27 0.10 mg/kg 27-APR-16 01-MAX-16 R4024936 Cabati (Ca) 1.27 0.10 mg/kg 27-APR-16 01-MAX-18 R4024936 Cabati (Ca) 1.37 0.50 mg/kg 27-APR-16 01-MAX-18 R4024936 Lindu (L) -2.0 2.0 mg/kg <td>Metals in Soil by CRC ICPMS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Metals in Soil by CRC ICPMS							
Animory (Sb) 3.81 0.10 mg/kg 27-APR-16 01-MAY-16 R024936 Barium (Ba) 241 0.50 mg/kg 27-APR-16 01-MAY-16 R024936 Barium (Ba) 201 0.10 mg/kg 27-APR-16 01-MAY-18 R024936 Bismuth (Bi) 16.3 0.20 mg/kg 27-APR-18 01-MAY-18 R024936 Cadinum (Ca) 0.392 0.020 mg/kg 27-APR-18 01-MAY-18 R024936 Cadinum (Ca) 0.392 0.020 mg/kg 27-APR-18 01-MAY-18 R024936 Cadinum (Ca) 2.23 0.50 mg/kg 27-APR-18 01-MAY-18 R024936 Cobait (Ca) 1.27 0.10 mg/kg 27-APR-18 01-MAY-18 R024936 Lead (Pb) 3.79 0.50 mg/kg 27-APR-18 01-MAY-18 R024936 Lead (Pb) 3.79 0.50 mg/kg 27-APR-18 01-MAY-18 R024936 Lead (Pb) 3.79 0.50 mg/kg <td>Aluminum (AI)</td> <td>31100</td> <td></td> <td>50</td> <td>mg/kg</td> <td>27-APR-18</td> <td>01-MAY-18</td> <td>R4024936</td>	Aluminum (AI)	31100		50	mg/kg	27-APR-18	01-MAY-18	R4024936
Arsenic (As) 6.38 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Barium (Ba) -0.10 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Bernuth (Bi) 16.3 0.20 mg/kg 27-APR-18 01-MAY-18 R4024936 Bornuth (Bi) 13.6 5.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Cadmium (Ca) 0.292 0.020 mg/kg 27-APR-18 01-MAY-18 R4024936 Cadmium (Ca) 0.292 0.020 mg/kg 27-APR-18 01-MAY-18 R4024936 Cadmium (Ca) 1.277 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Cobait (Ca) 1.277 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Lindium (Li) -2.0 2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Manganees (Mn) 101 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Molyoberum (Mo) 13.5 0.10<	Antimony (Sb)	3.81		0.10	mg/kg	27-APR-18	01-MAY-18	R4024936
Barium (Ba) 241 0.50 mg/kg 27-APR-18 01-MAY-18 R4024393 Bismuth (B) 16.3 0.20 mg/kg 27-APR-18 01-MAY-18 R4024393 Cardium (Ca) 13.6 5.0 mg/kg 27-APR-18 01-MAY-18 R4024393 Cardium (Ca) 0.292 0.020 mg/kg 27-APR-18 01-MAY-18 R4024393 Cardium (Ca) 1.27 0.10 mg/kg 27-APR-18 01-MAY-18 R4024393 Copper (Cu) 236 0.50 mg/kg 27-APR-18 01-MAY-18 R4024393 Iron (Fe) 33690 50 mg/kg 27-APR-18 01-MAY-18 R4024393 Ladium (Li) -2.0 2.0 mg/kg 27-APR-18 01-MAY-18 R4024393 Magnesium (Mg) 4060 20 mg/kg 27-APR-18 01-MAY-18 R4024393 Magnesium (Mo) 13.5 0.10 mg/kg 27-APR-18 01-MAY-18 R4024393 Magnesium (Mo) 13.5 0.10	Arsenic (As)	6.38		0.10	mg/kg	27-APR-18	01-MAY-18	R4024936
Beryllium (Be) e-0.10 mg/kg 27-APR-18 01-MAY-18 R4024396 Bismuth (B) 15.3 0.20 mg/kg 27-APR-18 01-MAY-18 R4024396 Cadmium (Cd) 0.282 0.20 mg/kg 27-APR-18 01-MAY-18 R4024396 Calcium (Ca) 0.223 0.50 mg/kg 27-APR-18 01-MAY-18 R4024396 Cobett (Ca) 1.277 0.10 mg/kg 27-APR-18 01-MAY-18 R4024395 Cobett (Ca) 1.277 0.10 mg/kg 27-APR-18 01-MAY-18 R4024395 Lead (Pb) 3.79 0.50 mg/kg 27-APR-18 01-MAY-18 R4024393 Latitium (Li) -2.0 2.0 mg/kg 27-APR-18 01-MAY-18 R40243936 Manganese (M) 101 1.0 mg/kg 27-APR-18 01-MAY-18 R40243936 Nicket (N) 14.6 0.50 mg/kg 27-APR-18 01-MAY-18 R40243936 Nicket (N) 14.6 0.50 mg/kg	Barium (Ba)	241		0.50	mg/kg	27-APR-18	01-MAY-18	R4024936
Bismuth (B) 16.3 0.20 mg/kg 27-APR-18 01-MAY-18 R4024395 Caditum (Ca) 0.292 0.020 mg/kg 27-APR-18 01-MAY-18 R4024395 Caditum (Ca) 16800 50 mg/kg 27-APR-18 01-MAY-18 R4024395 Coball (Ca) 1.27 0.10 mg/kg 27-APR-18 01-MAY-18 R4024395 Coball (Ca) 1.27 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Coball (Ca) 2.23 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Lasid (Pb) 2.73 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Lasid (Pb) 3.79 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Magnesium (Mg) 4060 20 mg/kg 27-APR-18 01-MAY-18 R4024936 Malopanese (Mn) 101 1.0 mg/kg 27-APR-18 01-MAY-18 R4024935 Nicke(N) 135 0.10	Beryllium (Be)	<0.10		0.10	mg/kg	27-APR-18	01-MAY-18	R4024936
Botton (B) 13.6 5.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Cadnium (Ca) 0.292 0.020 mg/kg 27-APR-18 01-MAY-18 R4024936 Chromium (Cr) 22.3 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Cobalt (Co) 1.27 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Cobalt (Co) 2.36 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Iron (Fe) 3590 50 mg/kg 27-APR-18 01-MAY-18 R4024936 Lead (Pb) 3.73 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Lithium (Li) <	Bismuth (Bi)	16.3		0.20	mg/kg	27-APR-18	01-MAY-18	R4024936
Calaburn (Ca) 0.292 0.020 mg/kg 27-APR-18 01-MAY-18 Ad224366 Chromium (Ca) 22.3 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Cobalt (Ca) 1.27 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Cobalt (Ca) 1.27 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Cobart (Cb) 3.379 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Ladi (Pb) 3.379 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Lithium (Li) -2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Magnesium (Mg) 4060 20 mg/kg 27-APR-18 01-MAY-18 R4024936 Magnesium (Mo) 135 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Molydelanum (Mo) 135 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Nickel (Ni) 52 0 mg/kg	Boron (B)	13.6		5.0	mg/kg	27-APR-18	01-MAY-18	R4024936
Cartonium (Cr) D30 ImpR ZF-APR-18 OH-MAT-16 R4024936 Cobatt (Co) 1.27 0.10 mg/kg ZF-APR-18 OH-MAT-16 R4024936 Cobatt (Co) 2.36 0.50 mg/kg ZF-APR-18 OH-MAT-16 R4024936 Cobatt (Co) 2.36 0.50 mg/kg ZF-APR-18 OH-MAT-16 R4024936 Lead (Pb) 3.79 0.50 mg/kg ZF-APR-18 OH-MAT-18 R4024936 Lithium (Li) <2.0	Calcium (Co)	0.292		0.020	mg/kg	27-APR-18	01-MAY-18	R4024936
Cobalt (Cr) 22.3 0.30 mg/kg 27-APR-18 0-1-MA 71-18 R4024936 Cobalt (Co) 236 0.50 mg/kg 27-APR-18 0-1-MA 71-18 R4024936 Iron (Fe) 3590 50 mg/kg 27-APR-18 01-MA 71-18 R4024936 Lead (Pb) 3.79 0.50 mg/kg 27-APR-18 01-MA 71-18 R4024936 Lithium (Li) -2.0 2.0 mg/kg 27-APR-18 01-MA 71-18 R4024936 Magnesium (Mg) 4060 2.0 mg/kg 27-APR-18 01-MA 71-18 R4024936 Magnesium (Mg) 101 1.0 mg/kg 27-APR-18 01-MA 71-18 R4024936 Molybdenum (Mo) 13.5 0.10 mg/kg 27-APR-18 01-MA 71-18 R4024936 Nickel (Ni 14.6 0.50 mg/kg 27-APR-18 01-MA 71-18 R4024936 Solum (K) 5720 100 mg/kg 27-APR-18 01-MA 71-18 R4024936 Sulver (A) 0.72 0.10<	Chromium (Cr)	16800		50	mg/kg	27-APR-10		R4024936
Cooper (Cu) 1.2.1 0.10 mg/kg 27-APR-18 0-1-MAY-18 R4024936 Iron (Fe) 3590 50 mg/kg 27-APR-18 0-1-MAY-18 R4024936 Lead (Pb) 3,79 0.50 mg/kg 27-APR-18 0-1-MAY-18 R4024936 Lithium (Li) -2.0 2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Magnesse (Mn) 101 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Mickel (Ni) 13.5 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Nickel (Ni) 13.5 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Potassium (K) 5720 100 mg/kg 27-APR-18 01-MAY-18 R4024936 Soleinium (Se) 2.47 0.20 mg/kg 27-APR-18 01-MAY-18 R4024936 Stirontium (Se) 0.72 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Strontium (Se) 0.72 0.50	Cobalt (Co)	22.3		0.50	mg/kg	27-APR-18	01-MAV-18	R4024930
Borp (CD) LDO DOD mg/kg LTARTS DTARTS	Copper (Cu)	236		0.10	mg/kg	27-APR-18	01-MAY-18	R4024930
Lead (Pb) 3.79 0.50 mg/kg 27-APR-18 01-MAY-18 R4024393 Lithium (Li) 2.0 2.0 mg/kg 27-APR-18 01-MAY-18 R40243936 Magnesium (Mg) 4060 2.0 mg/kg 27-APR-18 01-MAY-18 R40243936 Magnesium (Mg) 101 1.0 mg/kg 27-APR-18 01-MAY-18 R40243936 Mohybdenum (Mo) 13.5 0.10 mg/kg 27-APR-18 01-MAY-18 R40243936 Nickel (N) 14.6 0.50 mg/kg 27-APR-18 01-MAY-18 R40243936 Phosphorus (P) 27600 50 mg/kg 27-APR-18 01-MAY-18 R40243936 Silver (Ag) 0.72 0.10 mg/kg 27-APR-18 01-MAY-18 R40243936 Sodium (Na) 1130 50 mg/kg 27-APR-18 01-MAY-18 R40243936 Sodium (Na) 11130 50 mg/kg 27-APR-18 01-MAY-18 R40243936 Suffur (S) 6000 1000	Iron (Fe)	3590		50	ma/ka	27-APR-18	01-MAY-18	R4024936
Lithium (Li) -2.0 2.0 mg/kg 27-APR-18 01-MAY-18 R4024395 Magnensium (Mg) 4060 20 mg/kg 27-APR-18 01-MAY-18 R4024395 Magnessium (Mg) 101 1.0 mg/kg 27-APR-18 01-MAY-18 R4024395 Molybdenum (Mo) 13.5 0.10 mg/kg 27-APR-18 01-MAY-18 R4024396 Nickel (Ni) 14.6 0.50 mg/kg 27-APR-18 01-MAY-18 R4024396 Phosphorus (P) 27600 50 mg/kg 27-APR-18 01-MAY-18 R4024396 Solum (Ns) 5720 100 mg/kg 27-APR-18 01-MAY-18 R4024396 Subtri (S) 6600 100 mg/kg 27-APR-18 01-MAY-18 R4024396 Suffur (S) 6600 1000 mg/kg 27-APR-18 01-MAY-18 R4024395 Tha (In) 11.5 2.0 mg/kg 27-APR-18 01-MAY-18 R4024395 Suffur (S) 66600 1000 <td< td=""><td>Lead (Pb)</td><td>3.79</td><td></td><td>0.50</td><td>ma/ka</td><td>27-APR-18</td><td>01-MAY-18</td><td>R4024936</td></td<>	Lead (Pb)	3.79		0.50	ma/ka	27-APR-18	01-MAY-18	R4024936
Magnesium (Mg) 4060 20 mg/kg 27-APR-18 01-MAY-18 R4024936 Manganese (Mn) 101 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Molybdenum (Mo) 13.5 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Nickel (Ni) 14.6 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Phosphorus (P) 27600 50 mg/kg 27-APR-18 01-MAY-18 R4024936 Potassim (K) 5720 100 mg/kg 27-APR-18 01-MAY-18 R4024936 Selenium (Se) 2.47 0.20 mg/kg 27-APR-18 01-MAY-18 R4024936 Soliur (A) 0.72 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Sufur (S) 6600 1000 mg/kg 27-APR-18 01-MAY-18 R4024936 Sufur (S) 6600 1000 mg/kg 27-APR-18 01-MAY-18 R4024936 Thalium (Ti) 12.1 1.0	Lithium (Li)	<2.0		2.0	mg/kg	27-APR-18	01-MAY-18	R4024936
Manganese (Mn) 101 1.0 mg/kg 27.APR-18 01-MAY-18 R4024936 Molybdenum (Mo) 13.5 0.10 mg/kg 27.APR-18 01-MAY-18 R4024936 Nickel (Ni) 14.6 0.50 mg/kg 27.APR-18 01-MAY-18 R4024936 Phosphorus (P) 27600 50 mg/kg 27.APR-18 01-MAY-18 R4024936 Potassium (K) 5720 100 mg/kg 27.APR-18 01-MAY-18 R4024936 Selenium (Se) 2.47 0.20 mg/kg 27.APR-18 01-MAY-18 R4024936 Silver (Ag) 0.72 0.10 mg/kg 27.APR-18 01-MAY-18 R4024936 Stontium (Sr) 1130 50 mg/kg 27.APR-18 01-MAY-18 R4024936 Suffur (S) 6600 1000 mg/kg 27.APR-18 01-MAY-18 R4024936 Suffur (S) 0.55 mg/kg 27.APR-18 01-MAY-18 R4024936 Thalium (TI) 12.1 1.0 mg/kg	Magnesium (Mg)	4060		20	mg/kg	27-APR-18	01-MAY-18	R4024936
Molybdenum (Mo) 13.5 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Nickel (Ni) 14.6 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Phosphorus (P) 27600 50 mg/kg 27-APR-18 01-MAY-18 R4024936 Potassium (K) 5720 100 mg/kg 27-APR-18 01-MAY-18 R4024936 Selenium (Se) 2.47 0.20 mg/kg 27-APR-18 01-MAY-18 R4024936 Sodium (Na) 1130 50 mg/kg 27-APR-18 01-MAY-18 R4024936 Strontium (Sr) 192 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Sulfur (S) 6600 1000 mg/kg 27-APR-18 01-MAY-18 R4024936 Tinalium (TI) 11.5 2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Tungsten (W) 0.57 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Tungsten (W) 2.16 0.57	Manganese (Mn)	101		1.0	mg/kg	27-APR-18	01-MAY-18	R4024936
Nickel (Ni) 14.6 0.50 mg/kg 27-APR.18 01-MAY-18 R4024396 Photassium (K) 27600 50 mg/kg 27-APR.18 01-MAY-18 R4024396 Potassium (K) 5720 100 mg/kg 27-APR.18 01-MAY-18 R4024396 Selenium (Se) 2.47 0.20 mg/kg 27-APR.18 01-MAY-18 R4024396 Solium (Na) 1130 50 mg/kg 27-APR.18 01-MAY-18 R4024396 Sutrontium (Sr) 192 0.50 mg/kg 27-APR.18 01-MAY-18 R4024396 Sutfur (S) 6600 1000 mg/kg 27-APR.18 01-MAY-18 R4024396 Sutfur (S) 11.5 2.0 mg/kg 27-APR.18 01-MAY-18 R4024396 Tinaium (Ti) -0.050 0.050 mg/kg 27-APR.18 01-MAY-18 R4024396 Tungsten (W) 0.57 0.050 mg/kg 27-APR.18 01-MAY-18 R4024396 Sutfur (CI) 2.19 0.20	Molybdenum (Mo)	13.5		0.10	mg/kg	27-APR-18	01-MAY-18	R4024936
Phosphorus (P) 27600 50 mg/kg 27-APR-18 01-MAY-18 R4024936 Potassium (K) 5720 100 mg/kg 27-APR-18 01-MAY-18 R4024936 Selenium (Se) 2.47 0.20 mg/kg 27-APR-18 01-MAY-18 R4024936 Sodium (Na) 0.72 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Sodium (Na) 1130 50 mg/kg 27-APR-18 01-MAY-18 R4024936 Strontium (Sr) 192 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Suffur (S) 6600 1000 mg/kg 27-APR-18 01-MAY-18 R4024936 Tin (Sn) 11.5 2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Turgsten (W) 0.57 0.050 mg/kg 27-APR-18 01-MAY-18 R4024936 Vanadium (V) 2.19 0.20 mg/kg 27-APR-18 01-MAY-18 R4024936 Zirconium (Zr) 33.9 1.0	Nickel (Ni)	14.6		0.50	mg/kg	27-APR-18	01-MAY-18	R4024936
Potassium (K) 5720 100 mg/kg 27.4PR-18 01-MAY-18 R4024936 Selenium (Se) 2.47 0.20 mg/kg 27.4PR-18 01-MAY-18 R4024936 Silver (Ag) 0.72 0.10 mg/kg 27.4PR-18 01-MAY-18 R4024936 Sodium (Na) 1130 50 mg/kg 27.4PR-18 01-MAY-18 R4024936 Strontium (Sr) 192 0.50 mg/kg 27.4PR-18 01-MAY-18 R4024936 Sulfur (S) 6600 1000 mg/kg 27.4PR-18 01-MAY-18 R4024936 Thallium (TI) <0.050	Phosphorus (P)	27600		50	mg/kg	27-APR-18	01-MAY-18	R4024936
Selenium (Se) 2.47 0.20 mg/kg 27.4PR-18 01-MAY-18 R4024936 Silver (Ag) 0.72 0.10 mg/kg 27.4PR-18 01-MAY-18 R4024936 Sodium (Na) 1130 50 mg/kg 27.4PR-18 01-MAY-18 R4024936 Strontium (Sr) 192 0.50 mg/kg 27.4PR-18 01-MAY-18 R4024936 Sulfur (S) 66600 1000 mg/kg 27.4PR-18 01-MAY-18 R4024936 Tin (Sn) 11.5 2.0 mg/kg 27.4PR-18 01-MAY-18 R4024936 Titanium (Ti) 12.1 1.0 mg/kg 27.4PR-18 01-MAY-18 R4024936 Tungsten (W) 0.57 0.50 mg/kg 27.4PR-18 01-MAY-18 R4024936 Vanadium (V) 2.19 0.20 mg/kg 27.4PR-18 01-MAY-18 R4024936 Zinc (Zn) 2.19 0.20 mg/kg 27.4PR-18 01-MAY-18 R4024936 Zinc (Zn) 2.19 0.20 mg/	Potassium (K)	5720		100	mg/kg	27-APR-18	01-MAY-18	R4024936
Silver (Ag) 0.72 0.10 mg/kg 27-APR-18 01-MAY-18 R4024936 Sodium (Na) 1130 50 mg/kg 27-APR-18 01-MAY-18 R4024936 Strontium (Sr) 192 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Sulfur (S) 6600 1000 mg/kg 27-APR-18 01-MAY-18 R4024936 Tin (Sn) 11.5 2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Titanium (TI) 12.1 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Tungsten (W) 0.57 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Vanatium (V) 2.19 0.20 mg/kg 27-APR-18 01-MAY-18 R4024936 Zinc (Zn) 235 2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Zirconium (Zr) 33.9 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Zirconium (Zr) 21:2 soil:water) 6.40	Selenium (Se)	2.47		0.20	mg/kg	27-APR-18	01-MAY-18	R4024936
Sodium (Na) 1130 50 mg/kg 27-APR-18 01-MAY-18 R4024936 Strontium (Sr) 192 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Sulfur (S) 6600 1000 mg/kg 27-APR-18 01-MAY-18 R4024936 Thallium (TI) <0.050	Silver (Ag)	0.72		0.10	mg/kg	27-APR-18	01-MAY-18	R4024936
Stontium (Sr) 192 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Sulfur (S) mg/kg 27-APR-18 01-MAY-18 R4024936 Thallium (TI) <0.050	Sodium (Na)	1130		50	mg/kg	27-APR-18	01-MAY-18	R4024936
Source (S) Bood/ Thallium (TI) Bood/ Construct Hou bit (Mark) 27-APR-18 C1-MAY-18 R4024936 Tin (Sn) 11.5 2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Titanium (Ti) 12.1 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Tungsten (W) 0.57 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Uranium (U) 28.6 0.050 mg/kg 27-APR-18 01-MAY-18 R4024936 Zinc (Zn) 235 2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Zirconium (Zr) 235 2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Zirconium (Zr) 33.9 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 PH in soil (1:2 Soil:Water Extraction) 6.40 0.10 pH 27-APR-18 R4024549 Miscellaneous Parameters - 0.10 0.10 % 27-APR-18 R40245601 Moisture 91.3	Strontium (Sr)	192		0.50	mg/kg	27-APR-18	01-MAY-18	R4024936
Tin (Tr) Total (Tr) Total (Tr)	Sului (S) Thallium (TI)	6600		1000	mg/kg	27-APR-10		R4024936
Titanium (Ti) 11.5 2.0 Ing/kg 27-APR-18 01-MAY-18 R4024936 Tungsten (W) 0.57 0.50 mg/kg 27-APR-18 01-MAY-18 R4024936 Uranium (U) 28.6 0.050 mg/kg 27-APR-18 01-MAY-18 R4024936 Vanadium (V) 2.19 0.20 mg/kg 27-APR-18 01-MAY-18 R4024936 Zinconium (Zr) 235 2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 PH in soil (1:2 Soil:Water Extraction) 33.9 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 pH in soil (1:2 soil:water) 6.40 0.10 pH 27-APR-18 01-MAY-18 R4024596 Miscellaneous Parameters -	Tin (Sn)	<0.050		2.0	mg/kg	27-APR-18	01-MAV-18	R4024930
Tunstain (if) The first of the second se	Titanium (Ti)	12.1		2.0	ma/ka	27-APR-18	01-MAY-18	R4024936
Uranium (U) 28.6 0.050 mg/kg 27.APR-18 01-MAY-18 R4024936 Vanadium (V) 2.19 0.20 mg/kg 27.APR-18 01-MAY-18 R4024936 Zinc (Zn) 235 2.0 mg/kg 27.APR-18 01-MAY-18 R4024936 Zirconium (Zr) 33.9 1.0 mg/kg 27.APR-18 01-MAY-18 R4024936 pH in soil (1:2 Soil:Water Extraction) 6.40 0.10 pH 27-APR-18 01-MAY-18 R4024936 Coliform Bacteria - Fecal >18494.25 2 MPN/g 27-APR-18 R4024549 Moisture 91.3 0.25 % 27-APR-18 R4024764 Non-compostable and sharp matter 0.10 % 04-MAY-18 R4037914 Foreign Matter - Sharps 0.10 % 04-MAY-18 R4037914 Unit conversion from mg/kg to ug/kg 31100000 50000 ug/kg 01-MAY-18 R4037914 Arsenic (As) 3810 100 ug	Tungsten (W)	0.57		0.50	ma/ka	27-APR-18	01-MAY-18	R4024936
Vanadium (V) 2.19 0.20 mg/kg 27-APR-18 01-MAY-18 R4024936 Zinc (Zn) 235 33.9 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Zirconium (Zr) 33.9 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 pH in soil (1:2 Soil:Water Extraction) 6.40 0.10 pH 27-APR-18 01-MAY-18 R4024936 Miscellaneous Parameters 6.40 0.10 pH 27-APR-18 R4024549 Moisture 91.3 0.25 % 27-APR-18 R4024764 Non-compostable and sharp matter <0.10	Uranium (U)	28.6		0.050	ma/ka	27-APR-18	01-MAY-18	R4024936
Zinc (Zn) 235 2.0 mg/kg 27-APR-18 01-MAY-18 R4024936 Zirconium (Zr) 33.9 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 pH in soil (1:2 Soil:Water Extraction) 6.40 0.10 pH 27-APR-18 01-MAY-18 R4024936 Miscellaneous Parameters 6.40 0.10 pH 27-APR-18 R4024549 Coliform Bacteria - Fecal >18494.25 2 MPN/g 27-APR-18 R4024764 Non-compostable and sharp matter 91.3 0.25 % 27-APR-18 R4024764 Non-compostable and sharp matter <0.10	Vanadium (V)	2.19		0.20	mg/kg	27-APR-18	01-MAY-18	R4024936
Zirconium (Zr) 33.9 1.0 mg/kg 27-APR-18 01-MAY-18 R4024936 pH in soil (1:2 Soil:Water) 6.40 0.10 pH 27-APR-18 R4024549 Miscellaneous Parameters 518494.25 2 MPN/g 27-APR-18 R4024764 Moisture 91.3 0.25 % 27-APR-18 R4024764 Non-compostable and sharp matter R4037914 Foreign Matter <0.10 % 04-MAY-18 R4037914 Foreign Matter <0.10 % 04-MAY-18 R4037914 Minomy (Sb) 31100000 50000 ug/kg 01-MAY-18 R4037914 Artimony (Sb) 3810 100 ug/kg 01-MAY-18 R4037914 Barium (Ba) 241000 50000 ug/kg 01-MAY-18 Interval Beryllium (Be) 241000 500 ug/kg 01-MAY-18 Interval Beryllium (Be) 241000 500 ug/kg 01-MAY-18 Interval	Zinc (Zn)	235		2.0	mg/kg	27-APR-18	01-MAY-18	R4024936
pH in soil (1:2 Soil:Water Extraction) pH (1:2 soil:water) 6.40 0.10 pH 27-APR-18 R4024549 Miscellaneous Parameters >18494.25 2 MPN/g 27-APR-18 R4026501 Coliform Bacteria - Fecal >18494.25 2 MPN/g 27-APR-18 R4024764 Moisture 91.3 0.25 % 27-APR-18 R4024764 Non-compostable and sharp matter R4037914 R4037914 Foreign Matter Solution 0.10 % 04-MAY-18 R4037914 Foreign Matter - Sharps 31100000 50000 ug/kg 01-MAY-18 R4037914 Aluminum (Al) 31100000 50000 ug/kg 01-MAY-18 R4037914 Arsenic (As) 3810 100 ug/kg 01-MAY-18 4037914 Barium (Ba) 241000 5000 ug/kg 01-MAY-18 4037914 Beryllium (Be) 6380 100 ug/kg 01-MAY-18 4037914	Zirconium (Zr)	33.9		1.0	mg/kg	27-APR-18	01-MAY-18	R4024936
pH (1.2 solwatel) 6.40 0.10 pH 27-APR-18 R4024549 Miscellaneous Parameters >18494.25 2 MPN/g 27-APR-18 R4026501 Moisture 91.3 0.25 % 27-APR-18 R4024764 Non-compostable and sharp matter 91.3 0.25 % 27-APR-18 R4024764 Foreign Matter <0.10	pH in soil (1:2 Soil:Water Extraction)	0.40		0.40	-11			D 400 45 40
Miscentarieous Farameters >18494.25 2 MPN/g 27-APR-18 R4026501 Moisture 91.3 0.25 % 27-APR-18 R4024764 Non-compostable and sharp matter 91.3 0.10 % 04-MAY-18 R4037914 Foreign Matter <0.10	μη (1.2 soll.water) Miscollangous Parameters	6.40		0.10	рн		21-APK-18	K4024549
Contoint Bacteria Frecal 318494.23 2 Mirrivg 27 APRC18 R4020501 Moisture 91.3 0.25 % 27 APRC18 R4024764 Non-compostable and sharp matter <0.10	Coliform Pactoria Eacol	× 19404 25		2	MDN/a			P4026501
Molsule 91.3 0.23 76 27 AP K-13 K4024764 Non-compostable and sharp matter <0.10	Moieturo	210494.25		2 0.25	0/.		27-AL 1-10	R4020301
Foreign Matter <0.10 0.10 % 04-MAY-18 R4037914 Foreign Matter - Sharps <0.10	Non-compostable and sharp matter	91.0		0.20	/0		2/-AFR-10	R4U24704
Foreign Matter - Snarps <0.10 0.10 % 04-MAY-18 R4037914 Unit conversion from mg/kg to ug/kg 31100000 50000 ug/kg 01-MAY-18 Aluminum (Al) 31100000 50000 ug/kg 01-MAY-18 Antimony (Sb) 3810 100 ug/kg 01-MAY-18 Barium (Ba) 241000 500 ug/kg 01-MAY-18 Beryllium (Be) <100 ug/kg 01-MAY-18	Foreign Matter	<0.10		0.10	%		04-MAY-18	R4037914
Outric conversion from mg/kg to ug/kg 31100000 50000 ug/kg 01-MAY-18 Aluminum (Al) 3810 100 ug/kg 01-MAY-18 Antimony (Sb) 3810 100 ug/kg 01-MAY-18 Arsenic (As) 6380 100 ug/kg 01-MAY-18 Barium (Ba) 241000 500 ug/kg 01-MAY-18 Beryllium (Be) <100		<0.10		0.10	%		04-IVIA Y-18	K4U37914
Antimony (Sb) 3810 100 ug/kg 01-MAY-18 Arsenic (As) 6380 100 ug/kg 01-MAY-18 Barium (Ba) 241000 500 ug/kg 01-MAY-18 Beryllium (Be) <100	Onit conversion from mg/kg to ug/kg Aluminum (Al)	31100000		50000	ug/kg		01-MAY-18	
Arsenic (As) 6380 100 ug/kg 01-MAY-18 Barium (Ba) 241000 500 ug/kg 01-MAY-18 Beryllium (Be) <100	Antimony (Sb)	3810		100	ug/kg		01-MAY-18	
Barium (Ba) 241000 500 ug/kg 01-MAY-18 Beryllium (Be) <100	Arsenic (As)	6380		100	ug/kg		01-MAY-18	
Beryllium (Be) <100 100 ug/kg 01-MAY-18	Barium (Ba)	241000		500	ug/kg		01-MAY-18	
	Beryllium (Be)	<100		100	ug/kg		01-MAY-18	

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: T I on 25-APR-18 @ 14:00							
Maurix. OTHER							
Unit conversion from mg/kg to ug/kg Bismuth (Bi)	16300		200	ua/ka		01-MAY-18	
Boron (B)	13600		5000	ug/kg		01-MAY-18	
Cadmium (Cd)	292		20	ua/ka		01-MAY-18	
Calcium (Ca)	16800000		50000	ua/ka		01-MAY-18	
Chromium (Cr)	22300		500	ug/kg		01-MAY-18	
Cobalt (Co)	1270		100	ug/kg		01-MAY-18	
Copper (Cu)	236000		500	ug/kg		01-MAY-18	
Iron (Fe)	3590000		50000	ug/kg		01-MAY-18	
Lead (Pb)	3790		500	ug/kg		01-MAY-18	
Lithium (Li)	<2000		2000	ug/kg		01-MAY-18	
Magnesium (Mg)	4060000		20000	ug/kg		01-MAY-18	
Manganese (Mn)	101000		1000	ug/kg		01-MAY-18	
Molybdenum (Mo)	13500		100	ug/kg		01-MAY-18	
Nickel (Ni)	14600		500	ug/kg		01-MAY-18	
Phosphorus (P)	27600000		50000	ug/kg		01-MAY-18	
Potassium (K)	5720000		100000	ug/kg		01-MAY-18	
Selenium (Se)	2470		200	ug/kg		01-MAY-18	
Silver (Ag)	720		100	ug/kg		01-MAY-18	
Sodium (Na)	1130000		50000	ug/kg		01-MAY-18	
Strontium (Sr)	192000		500	ug/kg		01-MAY-18	
Thallium (TI)	<50		50	ug/kg		01-MAY-18	
Tin (Sn)	11500		2000	ug/kg		01-MAY-18	
litanium (II)	12100		1000	ug/kg		01-MAY-18	
Venedium (U)	28600		50	ug/kg		01-MAY-18	
$Z_{inc}(Z_{n})$	2190		200	ug/kg			
Zirconium (Zr)	235000		2000	ug/kg		01-MAY-18	
	33900		1000	uy/ky		01-10141-10	
L2003494-2 APRIL 2017 SOLIDS							
Matrix: UTHER Motolo in Soil (CSB) with Extra Motolo							
Moreury in Soil by CVAAS							
Mercury (Ha)	0 128		0.0050	ma/ka	27-APR-18	28-APR-18	R4024899
Metals in Soil by CRC ICPMS	0.120		0.0000	ing/itg		20741010	114024000
Aluminum (Al)	32500		50	mg/kg	27-APR-18	01-MAY-18	R4024936
Antimony (Sb)	3.03		0.10	mg/kg	27-APR-18	01-MAY-18	R4024936
Arsenic (As)	10.3		0.10	mg/kg	27-APR-18	01-MAY-18	R4024936
Barium (Ba)	556		0.50	mg/kg	27-APR-18	01-MAY-18	R4024936
Beryllium (Be)	0.13		0.10	mg/kg	27-APR-18	01-MAY-18	R4024936
Bismuth (Bi)	26.7		0.20	mg/kg	27-APR-18	01-MAY-18	R4024936
Boron (B)	30.9		5.0	mg/kg	27-APR-18	01-MAY-18	R4024936
Cadmium (Cd)	0.387		0.020	mg/kg	27-APR-18	01-MAY-18	R4024936
Calcium (Ca)	32800		50	mg/kg	27-APR-18	01-MAY-18	R4024936
Chromium (Cr)	39.5		0.50	mg/kg	27-APR-18	01-MAY-18	R4024936
Cobalt (Co)	3.25		0.10	mg/kg	27-APR-18	01-MAY-18	R4024936
Copper (Cu)	342		0.50	mg/kg	27-APR-18	01-MAY-18	R4024936
Iron (Fe)	5900		50	mg/kg	27-APR-18	01-MAY-18	R4024936
Lead (Pb)	6.28		0.50	mg/kg	27-APR-18	01-MAY-18	R4024936
Lithium (Li)	3.2		2.0	mg/kg	27-APR-18	01-MAY-18	R4024936
Magnesium (Mg)	6280		20	mg/kg	27-APR-18	01-MAY-18	R4024936
Ivianganese (IVIN)	1010		1.0	mg/kg	27-APR-18	U1-MAY-18	R4024936

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: T I on 25-APR-18 @ 14:00							
Metals in Soil by CRC ICPMS	44.4		0.10	malka		01 MAV 19	D4024026
Nickel (Ni)	11.4		0.10	mg/kg	27-AFR-10		R4024930
Phosphorus (P)	321.0		50	mg/kg	27-APR-18	01-MAY-18	R4024930
Potassium (K)	3780		100	ma/ka	27-APR-18	01-MAY-18	R4024930
Selenium (Se)	3 16		0.20	ma/ka	27-APR-18	01-MAY-18	R4024936
Silver (Ag)	1 14		0.10	ma/ka	27-APR-18	01-MAY-18	R4024936
Sodium (Na)	809		50	ma/ka	27-APR-18	01-MAY-18	R4024936
Strontium (Sr)	302		0.50	mg/kg	27-APR-18	01-MAY-18	R4024936
Sulfur (S)	9200		1000	mg/kg	27-APR-18	01-MAY-18	R4024936
Thallium (TI)	0.063		0.050	mg/kg	27-APR-18	01-MAY-18	R4024936
Tin (Sn)	2.0		2.0	mg/kg	27-APR-18	01-MAY-18	R4024936
Titanium (Ti)	2.9		1.0	mg/kg	27-APR-18	01-MAY-18	R4024936
Tungsten (W)	0.74		0.50	mg/kg	27-APR-18	01-MAY-18	R4024936
Uranium (U)	36.6		0.050	mg/kg	27-APR-18	01-MAY-18	R4024936
Vanadium (V)	5.27		0.20	mg/kg	27-APR-18	01-MAY-18	R4024936
Zinc (Zn)	287		2.0	mg/kg	27-APR-18	01-MAY-18	R4024936
Zirconium (Zr)	4.4		1.0	mg/kg	27-APR-18	01-MAY-18	R4024936
pH in soil (1:2 Soil:Water Extraction)							
pH (1:2 soil:water)	7.31		0.10	рН		27-APR-18	R4024549
Miscellaneous Parameters							
Coliform Bacteria - Fecal	<2		2	MPN/g		27-APR-18	R4026501
Moisture	77.3		0.25	%		27-APR-18	R4024764
Non-compostable and sharp matter				0/			B / 00 - 0 / /
Foreign Matter	3.57		0.10	%		04-MAY-18	R4037914
Foreign Matter - Sharps	<0.10		0.10	%		04-IVIA 1-18	R4037914
	22500000		50000	ua/ka		01-MAV-18	
Antimony (Sb)	3030		100	ug/kg		01-MAY-18	
Arsenic (As)	10300		100	ug/kg		01-MAY-18	
Barium (Ba)	556000		500	ug/kg		01-MAY-18	
Bervllium (Be)	130		100	ug/kg		01-MAY-18	
Bismuth (Bi)	26700		200	ua/ka		01-MAY-18	
Boron (B)	30900		5000	ua/ka		01-MAY-18	
Cadmium (Cd)	387		20	ug/kg		01-MAY-18	
Calcium (Ca)	32800000		50000	ug/kg		01-MAY-18	
Chromium (Cr)	39500		500	ug/kg		01-MAY-18	
Cobalt (Co)	3250		100	ug/kg		01-MAY-18	
Copper (Cu)	342000		500	ug/kg		01-MAY-18	
Iron (Fe)	5900000		50000	ug/kg		01-MAY-18	
Lead (Pb)	6280		500	ug/kg		01-MAY-18	
Lithium (Li)	3200		2000	ug/kg		01-MAY-18	
Magnesium (Mg)	6280000		20000	ug/kg		01-MAY-18	
Manganese (Mn)	1010000		1000	ug/kg		01-MAY-18	
Molybdenum (Mo)	11400		100	ug/kg		01-MAY-18	
Nickel (Ni)	27900		500	ug/kg		01-MAY-18	
Phosphorus (P)	32100000		50000	ug/kg		01-MAY-18	
Potassium (K)	3780000		100000	ug/kg		01-MAY-18	
Selenium (Se)	3160		200	ug/kg		01-MAY-18	
Silver (Ag)	1140		100	ug/kg		01-MAY-18	
Sodium (Na)	809000		50000	ug/kg		01-MAY-18	
Strontium (Sr)	302000		500	ug/kg		U1-MAY-18	

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2085494-2 APRIL 2017 SOLIDS Sampled By: TJ on 25-APR-18 @ 14:00 Matrix: OTHER Unit conversion from mg/kg to ug/kg Thallium (TI) Tin (Sn) Titanium (Ti) Uranium (U) Vanadium (V) Zinc (Zn) Zirconium (Zr)	63 2000 2900 36600 5270 287000 4400		50 2000 1000 50 200 2000 1000	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg		01-MAY-18 01-MAY-18 01-MAY-18 01-MAY-18 01-MAY-18 01-MAY-18 01-MAY-18	
	4400		1000	ug/kg		01-MAY-18	

Reference Information

Qualifiers for Sample Submission Listed:

EXTEMP10 15C - Samples Received with temperature >10 Degrees C Test Method Reference** ALS Test Code Matrix Test Description Method Reference** FCOLI-DRY-MTF-VA Soil Fecal coliform by MPN EPA Method 1680 This analysis is carried out using procedures adapted from EPA Method 1680 EPA Method 1680 This analysis is carried out using procedures adapted from EPA Method 1680 feeance** EPA Method 1680 Formentation using Laury Typtose Borbh (LTB) and EC medium". Serial dilutions of the sample are incubated with the appropriate growth medium feeal coliforms are quantified by a statistical estimation of bacteria density (most probable number). The test involves initial 48 hour incubation (presumptive test), positive results are further tested (up to an additional 24 hours) to confirm and quantify feeal coliforms. Results are reported or weight basis. FOREIGN-MATTER-VA Biocompost Non-compostable and sharp matter site steries and the subset of 'sharps' are weighed. B.C. OMRR Gample is dried, sieved, and weighed. Non-compostable objects and the subset of 'sharps' are weighed. Method Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS. EPA 200.2/1631E (mod) Soil and flee digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that meter and rusing a subject and the subsol of sharps result in a partial extraction. depending on the sample metor some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Ti, and V.	Qualifier	Description		
Fest Method References: Matrix Test Description Method Reference** ALS Test Code Matrix Test Description EPA Method 1680 FCOLI-DRY-MTF-VA Soil Fecal coliform EPA Method 1680 "Fecal Coliforms in Sewage Sludge (Biosolids) by Multiple Tube Ferrentation using Lauryl Tryptose Broth (LTB) and EC medium". Serial dilutions of the sample are incubated with the appropriate growth medium fecal coliforms are quantified by a statistical estimation of bacteria density (most probable number). The test involves initial 48 hour incubation (presumptive test), positive results are further tested (up to an additional 24 hours) to confirm and quantify fecal coliforms. Results are reported or weight basis. FOREIGN-MATTER-VA Biocompost Non-compostable and sharp matter B.C. OMRR Sample is dried, sieved, and weighed. Non-compostable objects and the subset of 'sharps' are weighed. HG-200.2-CVAA-CL Soil Metrury in Soil by CVAAS EPA 200.2/1631E (mod) Soil and hydrochloric acids, followed by analysis by CVAAS. MET-200.2-CCMS-CL Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A (mod) Soil anaples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS. EPA 200.2/6020A (mod) Soil anaples are digested with nitric does not dissolve all silicate materials and may result in a partial extraction. depending on the sample m for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Ti, and V. MOISTURE-VA	EXTEMP10	15C - Sampl	es Received with temperature >10 Degrees (
ALS Test Code Matrix Test Description Method Reference** FCOLI-DRY-MTF-VA Soil Fecal coliform by MPN EPA Method 1680 This analysis is carried out using procedures adapted from EPA Method 1680 "Fecal Coliforms in Sewage Sludge (Biosolids) by Multiple Tube Fermentation using Lauryl Tryptose Broth (LTB) and EC medium". Serial dilutions of the sample are incubated with the appropriate growth mediur fecal coliforms are quantified by a statistical estimation of bacteria density (most probable number). The test involves initial 48 hour incubation (presumptive test), positive results are further tested (up to an additional 24 hours) to confirm and quantify fecal coliforms. Results are reported or weight basis. FOREIGN-MATTER-VA Biocompost Non-compostable and sharp matter B.C. OMRR Sample is dried, sieved, and weighed. Non-compostable objects and the subset of 'sharps' are weighed. HG-200.2-CVAA-CL Soil Mercury in Soil by CVAAS EPA 200.2/1631E (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS. MET-200.2-CCMS-CL Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS. Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that m be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. dependi	Test Method Referen	ces:		
FCOLI-DRY-MTF-VASoilFecal coliform by MPNEPA Method 1680This analysis is carried out: using procedures adapted from EPA Method 1680 "Fecal Coliforms in Sewage Sludge (Biosolids) by Multiple Tube Fermentation using Laury! Tryptose Broth (LTB) and EC medium". Serial dilutions of the sample are incubated with the appropriate growth medium fecal coliforms are quantified by a statistical estimation of bacteria density (most probable number). The test involves initial 48 hour incubation (presumptive test), positive results are reported or weight basis.FOREIGN-MATTER-VABiocompost Non-compostable and sharp matterB.C. OMRRSample is dried, sieved, and weighed.Non-compostable objects and the subset of 'sharps' are weighed.HG-200.2-CVAA-CLSoilMercury in Soil by CVAASEPA 200.2/1631E (mod)Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.EPA 200.2/6020A (mod)Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVEMS.Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that m be environmentally available. This method oses not dissolve all silicice materials and maximum versul.CVEMS for PHC in Soil - Tier 1MOISTURE-VASoilMoisture contentCWS for PHC in Soil - Tier 1This analysis is carried out to be dissolve disorder at 105 C for a minimumSix hours.PH-1:2-CLSoilPH in soil (1:2 Soil:Water Extraction)CSS C h. 16Coll acid display disories to the display disories to be display disories and the perform and the p	ALS Test Code	Matrix	Test Description	Method Reference**
This analysis is carried out using procedures adapted from EPA Method 1680 "Fecal Coliforms in Sewage Sludge (Biosolids) by Multiple Tube Fermentation using Lauryl Tryptose Broth (LTB) and EC medium". Serial dilutions of the sample are incubated with the appropriate growth medium fecal coliforms are quantified by a statistical estimation of bacteria density (most probable number). The test involves initial 48 hour incubation presumptive test), positive results are further tested (up to an additional 24 hours) to confirm and quantify fecal coliforms. Results are reported or weight basis. FOREIGN-MATTER-VA Biocompost Non-compostable and sharp matter B.C. OMRR Sample is dried, sieved, and weighed. Non-compostable objects and the subset of 'sharps' are weighed. HG-200.2-CVAA-CL Soil Mercury in Soil by CVAAS EPA 200.2/1631E (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS. EPA 200.2/6020A (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS. Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that m be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample m for some metals, including, but not limited to AI, Ba, Be, Cr, Sr, Ti, TI, and V. MOISTURE-VA Soil Moisture content CWS for PHC in Soil - Tier 1 <td>FCOLI-DRY-MTF-VA</td> <td>Soil</td> <td>Fecal coliform by MPN</td> <td>EPA Method 1680</td>	FCOLI-DRY-MTF-VA	Soil	Fecal coliform by MPN	EPA Method 1680
FOREIGN-MATTER-VA Biocompost Non-compostable and sharp matter B.C. OMRR Sample is dried, sieved, and weighed. Non-compostable objects and the subset of 'sharps' are weighed. HG-200.2-CVAA-CL Soil Mercury in Soil by CVAAS EPA 200.2/1631E (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS. EPA 200.2/6020A (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS EPA 200.2/6020A (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS. EPA 200.2/6020A (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS. EPA 200.2/6020A (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS. EPA 200.2/6020A (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS. EPA 200.2/6020A (mod) Motsture and digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that m be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample method is solve and to assolve all silicate materials and may result in a partial extraction. depending on the sample method is solve and to assolve analysis is carried on the sample at 105 C for a minimum of six hours.	This analysis is carried Fermentation using Lau fecal coliforms are quar (presumptive test), posi weight basis.	out using proce ryl Tryptose Br ntified by a stati tive results are	edures adapted from EPA Method 1680 "Feca oth (LTB) and EC medium". Serial dilutions o stical estimation of bacteria density (most pro further tested (up to an additional 24 hours) t	al Coliforms in Sewage Sludge (Biosolids) by Multiple Tube f the sample are incubated with the appropriate growth medium, and obable number). The test involves initial 48 hour incubation to confirm and quantify fecal coliforms. Results are reported on a dry
Sample is dried, sieved, and weighed. Non-compostable objects and the subset of 'sharps' are weighed.HG-200.2-CVAA-CLSoilMercury in Soil by CVAASEPA 200.2/1631E (mod)Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.EPA 200.2/6020A (mod)MET-200.2-CCMS-CLSoilMetals in Soil by CRC ICPMSEPA 200.2/6020A (mod)Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.Metals in the total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that metals and may result in a partial extraction. depending on the sample metals, including, but not limited to AI, Ba, Be, Cr, Sr, Ti, TI, and V.MOISTURE-VASoilMoisture contentCWS for PHC in Soil - Tier 1This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.CSS Ch. 16PH-1:2-CLSoilpH in soil (1:2 Soil:Water Extraction)CSS Ch. 16	FOREIGN-MATTER-VA	Biocompo	st Non-compostable and sharp matter	B.C. OMRR
HG-200.2-CVAA-CLSoilMercury in Soil by CVAASEPA 200.2/1631E (mod)Soil samples are digested with nitric and typicochloric acids, followed by analysis by CVAASMET-200.2-CCMS-CLSoilMetals in Soil by CRC ICPMSEPA 200.2/6020A (mod)Soil samples are digested with nitric and typicochloric acids, followed by analysis by CRC ICPMSEPA 200.2/6020A (mod)Soil samples are digested with nitric and typicochloric acids, followed by analysis by CRC ICPMSMetals in Soil by CRC ICPMSMethod Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that metals and may result in a partial extraction. depending on the sample metals, including available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample metals, including available. This method so not dissolve all silicate materials and may result in a partial extraction. depending on the sample metals, including available. This method so not dissolve all silicate materials and may result in a partial extraction. depending on the sample metals, including available. This method so not dissolve all silicate materials and may result in a partial extraction. depending on the sample metals, including available. This method so not dissolve all solicate materials and may result in a partial extraction. depending on the sample metals, including available. This method so not dissolve all solicate materials and may result in a partial extraction.MOISTURE-VASoilMoisture contentCWS for PHC in Soil - Tier 1This analysis is carried out jervimetric by unplume typing the sample at 105 C for a minimum of six hours.Soil and the isolated data at a defined ratio. The elump is eleveed to tate data data at a before and the at and	Sample is dried, sieved	, and weighed.	Non-compostable objects and the subset of '	sharps' are weighed.
Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS. MET-200.2-CCMS-CL Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS. EPA 200.2/6020A (mod) Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that method some metals, including, but not limited to AI, Ba, Be, Cr, Sr, Ti, TI, and V. MOISTURE-VA Soil Moisture content CWS for PHC in Soil - Tier 1 This analysis is carried out gravimetricationary by drying the sample at 105 C for a minimum of six hours. ESS Ch. 16 PH-1:2-CL Soil pH in soil (1:2 Soil:Water Extraction) CSSS Ch. 16	HG-200.2-CVAA-CL	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (mod)
MET-200.2-CCMS-CL Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A (mod) Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS. Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that method some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, TI, and V. MOISTURE-VA Soil Moisture content CWS for PHC in Soil - Tier 1 This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours. PH-1:2-CL Soil PH-1:2-CL Soil pH in soil (1:2 Soil:Water Extraction) CSSS Ch. 16	Soil samples are digest	ed with nitric ar	nd hydrochloric acids, followed by analysis by	CVAAS.
Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS. Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that method be not dissolve all silicate materials and may result in a partial extraction. depending on the sample metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V. MOISTURE-VA Soil Moisture content CWS for PHC in Soil - Tier 1 This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours. PH-1:2-CL Soil PH-1:2-CL Soil pH in soil (1:2 Soil:Water Extraction) CSSS Ch. 16	MET-200.2-CCMS-CL	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that n be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample n for some metals, including, but not limited to AI, Ba, Be, Cr, Sr, Ti, TI, and V. MOISTURE-VA Soil Moisture content CWS for PHC in Soil - Tier 1 This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours. PH-1:2-CL Soil pH in soil (1:2 Soil:Water Extraction) CSSS Ch. 16 Soil and do ionized water (by very materia) are mixed in a defined ratio. The always is allowed to stand, abole an allowed to stand, abole and the application of the sample at the allowed to stand. Soil and the ionized water (by very materia) and materia).	Soil samples are digest	ed with nitric ar	nd hydrochloric acids, followed by analysis by	CRC ICPMS.
MOISTURE-VA Soil Moisture content CWS for PHC in Soil - Tier 1 This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours. PH-1:2-CL Soil pH in soil (1:2 Soil:Water Extraction) CSSS Ch. 16 Soil and do ionized water (by yolume) are mixed in a defined ratio. The alument is allowed to stand, abole and then allowed to stand, abole and then allowed to stand.	Method Limitation: This be environmentally ava for some metals, includ	s method is not lable. This met ing, but not limi	a total digestion technique. It is a very stron hod does not dissolve all silicate materials ar ited to Al, Ba, Be, Cr, Sr, Ti, TI, and V.	g acid digestion that is intended to dissolve those metals that may ad may result in a partial extraction. depending on the sample matrix,
This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours. PH-1:2-CL Soil pH in soil (1:2 Soil:Water Extraction) CSSS Ch. 16 Soil and do ionized water (by yolume) are mixed in a defined ratio. The always is allowed to stand, abaken, and then allowed to stand appin prior to the stand.	MOISTURE-VA	Soil	Moisture content	CWS for PHC in Soil - Tier 1
PH-1:2-CL Soil pH in soil (1:2 Soil:Water Extraction) CSSS Ch. 16	This analysis is carried	out gravimetric	ally by drying the sample at 105 C for a minin	num of six hours.
Soil and do ignized water (by yolume) are mixed in a defined ratio. The alway is allowed to stand, abaken, and then allowed to stand again prior to	PH-1:2-CL	Soil	pH in soil (1:2 Soil:Water Extraction)	CSSS Ch. 16
measurements. After equilibration, the pH of the liquid portion of the extract is measured by a pH meter. Field Measurement is recommended when accurate pH measurements are required, due to the 15 minute recommended hold time.	Soil and de-ionized wat measurements. After en accurate pH measurem	er (by volume) quilibration, the ents are require	are mixed in a defined ratio. The slurry is allo pH of the liquid portion of the extract is meas ed, due to the 15 minute recommended hold	wed to stand, shaken, and then allowed to stand again prior to taking sured by a pH meter. Field Measurement is recommended where time.
* ALS test methods may incorporate modifications from specified reference methods to improve performance.	* ALS test methods may	incorporate m	odifications from specified reference methods	s to improve performance.

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

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to gualifier 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.



Phosphorus (P)

			Qualit	y Cont	rol Report			
		Workorder:	L208549	4	Report Date: 08	8-MAY-18	Pa	ge 1 of 7
Client: KICKII 1505 - CALG Contact: TRAV	NG HORSE MOU • 17th AVENUE \$ ARY AB T2T 0E IS JOBIN	INTAIN UTILITY CO SW 2	ORPORATIC	DN				-
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
FCOLI-DRY-MTF-VA	Soil							
Batch R40265	01							
WG2760504-1 DU WG2760504-2 MB Coliform Bacteria - F	P ecal	L2085494-1	<2		MPN/g		2	27-APR-18
HG-200.2-CVAA-CL	Soil							
Batch R40248	99							
WG2759976-4 CRI Mercury (Hg)	Μ	TILL-1	89.6		%		70-130	28-APR-18
WG2759976-5 DU Mercury (Hg)	P	L2085494-2 0.128	0.116		mg/kg	9.3	40	28-APR-18
WG2759976-3 LCS Mercury (Hg)	6		93.2		%		80-120	28-APR-18
WG2759976-1 MB Mercury (Hg)			<0.0050		mg/kg		0.005	28-APR-18
MET-200.2-CCMS-CL	Soil							
Batch R40249	36							
WG2759976-4 CRI Aluminum (Al)	М	TILL-1	92.3		%		70-130	28-APR-18
Antimony (Sb)			91.3		%		70-130	28-APR-18
Arsenic (As)			95.9		%		70-130	28-APR-18
Barium (Ba)			103.5		%		70-130	28-APR-18
Beryllium (Be)			94.3		%		70-130	28-APR-18
Bismuth (Bi)			82.0		%		70-130	28-APR-18
Boron (B)			2.8		mg/kg		0-8.2	28-APR-18
Cadmium (Cd)			95.1		%		70-130	28-APR-18
Calcium (Ca)			95.7		%		70-130	28-APR-18
Chromium (Cr)			97.0		%		70-130	28-APR-18
Cobalt (Co)			98.3		%		70-130	28-APR-18
Copper (Cu)			97.2		%		70-130	28-APR-18
Iron (Fe)			97.5		%		70-130	28-APR-18
Lead (Pb)			88.8		%		70-130	28-APR-18
Lithium (Li)			83.1		%		70-130	28-APR-18
Magnesium (Mg)			104.5		%		70-130	28-APR-18
Manganese (Mn)			99.0		%		70-130	28-APR-18
Molybdenum (Mo)			94.1		%		70-130	28-APR-18
Nickel (Ni)			98.9		%		70-130	28-APR-18

96.4

%

70-130

28-APR-18



		Workorder	L208549	94	Report Date: 0	8-MAY-18	Page 2 of 7		
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
MET-200.2-CCMS-CL	Soil								
Batch R402493	36								
WG2759976-4 CRI	М	TILL-1							
Potassium (K)			100.5		%		70-130	28-APR-18	
Selenium (Se)			0.32		mg/kg		0.11-0.51	28-APR-18	
Silver (Ag)			0.21		mg/kg		0.13-0.33	28-APR-18	
Sodium (Na)			96.8		%		70-130	28-APR-18	
Strontium (Sr)			102.1		%		70-130	28-APR-18	
Thallium (TI)			0.105		mg/kg		0.077-0.18	28-APR-18	
Tin (Sn)			1.0		mg/kg		0-3.1	28-APR-18	
Titanium (Ti)			119.1		%		70-130	28-APR-18	
Tungsten (W)			0.14		mg/kg		0-0.66	28-APR-18	
Uranium (U)			90.2		%		70-130	28-APR-18	
Vanadium (V)			98.8		%		70-130	28-APR-18	
Zinc (Zn)			89.6		%		70-130	28-APR-18	
Zirconium (Zr)			0.7		mg/kg		0-1.8	28-APR-18	
WG2759976-5 DU	P	L2085494-2							
Aluminum (Al)		32500	36000		mg/kg	10	40	01-MAY-18	
Antimony (Sb)		3.03	3.26		mg/kg	7.4	30	01-MAY-18	
Arsenic (As)		10.3	11.3		mg/kg	9.2	30	01-MAY-18	
Barium (Ba)		556	587		mg/kg	5.4	40	01-MAY-18	
Beryllium (Be)		0.13	0.15		mg/kg	19	30	01-MAY-18	
Bismuth (Bi)		26.7	29.2		mg/kg	9.0	30	01-MAY-18	
Boron (B)		30.9	33.7		mg/kg	8.6	30	01-MAY-18	
Cadmium (Cd)		0.387	0.431		mg/kg	11	30	01-MAY-18	
Calcium (Ca)		32800	34700		mg/kg	5.6	30	01-MAY-18	
Chromium (Cr)		39.5	44.5		mg/kg	12	30	01-MAY-18	
Cobalt (Co)		3.25	3.61		mg/kg	11	30	01-MAY-18	
Copper (Cu)		342	370		mg/kg	7.7	30	01-MAY-18	
Iron (Fe)		5900	6280		mg/kg	6.3	30	01-MAY-18	
Lead (Pb)		6.28	6.48		mg/kg	3.2	40	01-MAY-18	
Lithium (Li)		3.2	3.0		mg/kg	7.2	30	01-MAY-18	
Magnesium (Mg)		6280	7080		mg/kg	12	30	01-MAY-18	
Manganese (Mn)		1010	1070		mg/kg	5.4	30	01-MAY-18	
Molybdenum (Mo)		11.4	12.0		mg/kg	5.5	40	01-MAY-18	
Nickel (Ni)		27.9	31.2		mg/kg	11	30	01-MAY-18	
Phosphorus (P)		32100	36000		mg/kg	11	30	01-MAY-18	



		Workorder:	L208549	94 Re	eport Date: 0)8-MAY-18	Page 3 of 7		
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
MET-200.2-CCMS-CL	Soil								
Batch R4024	936								
WG2759976-5 DL	JP	L2085494-2							
Potassium (K)		3780	4120		mg/kg	8.6	40	01-MAY-18	
Selenium (Se)		3.16	3.31		mg/kg	4.6	30	01-MAY-18	
Silver (Ag)		1.14	1.21		mg/kg	6.3	40	01-MAY-18	
Sodium (Na)		809	884		mg/kg	8.9	40	01-MAY-18	
Strontium (Sr)		302	313		mg/kg	3.9	40	01-MAY-18	
Sulfur (S)		9200	9600		mg/kg	4.6	30	01-MAY-18	
Thallium (Tl)		0.063	0.060		mg/kg	4.9	30	01-MAY-18	
Tin (Sn)		2.0	<2.0	RPD-NA	mg/kg	N/A	40	01-MAY-18	
Titanium (Ti)		2.9	1.4	J	mg/kg	1.5	2	01-MAY-18	
Tungsten (W)		0.74	0.77		mg/kg	3.6	30	01-MAY-18	
Uranium (U)		36.6	37.8		mg/kg	3.3	30	01-MAY-18	
Vanadium (V)		5.27	5.93		mg/kg	12	30	01-MAY-18	
Zinc (Zn)		287	320		mg/kg	11	30	01-MAY-18	
Zirconium (Zr)		4.4	4.9		mg/kg	9.9	30	01-MAY-18	
WG2759976-3 LC	s								
Aluminum (Al)			92.3		%		80-120	28-APR-18	
Antimony (Sb)			105.9		%		80-120	28-APR-18	
Arsenic (As)			100.4		%		80-120	28-APR-18	
Barium (Ba)			101.3		%		80-120	28-APR-18	
Beryllium (Be)			98.6		%		80-120	28-APR-18	
Bismuth (Bi)			92.0		%		80-120	28-APR-18	
Boron (B)			90.7		%		80-120	28-APR-18	
Cadmium (Cd)			102.9		%		80-120	28-APR-18	
Calcium (Ca)			96.2		%		80-120	28-APR-18	
Chromium (Cr)			95.3		%		80-120	28-APR-18	
Cobalt (Co)			99.4		%		80-120	28-APR-18	
Copper (Cu)			99.3		%		80-120	28-APR-18	
Iron (Fe)			105.3		%		80-120	28-APR-18	
Lead (Pb)			98.1		%		80-120	28-APR-18	
Lithium (Li)			92.8		%		80-120	28-APR-18	
Magnesium (Mg)			107.3		%		80-120	28-APR-18	
Manganese (Mn)			95.8		%		80-120	28-APR-18	
Molybdenum (Mo)			99.5		%		80-120	28-APR-18	
Nickel (Ni)			100.4		%		80-120	28-APR-18	



		Workorder: L2085494			Report Date: 0	8-MAY-18	Page 4 of 7		
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
MET-200.2-CCMS-CL	Soil								
Batch R40249	36								
WG2759976-3 LC	S								
Potassium (K)			107.1		%		80-120	28-APR-18	
Selenium (Se)			96.9		%		80-120	28-APR-18	
Silver (Ag)			99.4		%		80-120	28-APR-18	
Sodium (Na)			104.2		%		80-120	28-APR-18	
Strontium (Sr)			99.8		%		80-120	28-APR-18	
Sulfur (S)			89.8		%		80-120	28-APR-18	
Thallium (TI)			91.1		%		80-120	28-APR-18	
Tin (Sn)			102.5		%		80-120	28-APR-18	
Titanium (Ti)			107.1		%		80-120	28-APR-18	
Tungsten (W)			93.8		%		80-120	28-APR-18	
Uranium (U)			89.0		%		80-120	28-APR-18	
Vanadium (V)			102.2		%		80-120	28-APR-18	
Zinc (Zn)			88.1		%		80-120	28-APR-18	
Zirconium (Zr)			97.9		%		80-120	28-APR-18	
WG2759976-1 ME	3								
Aluminum (Al)			<50		mg/kg		50	28-APR-18	
Antimony (Sb)			<0.10		mg/kg		0.1	28-APR-18	
Arsenic (As)			<0.10		mg/kg		0.1	28-APR-18	
Barium (Ba)			<0.50		mg/kg		0.5	28-APR-18	
Beryllium (Be)			<0.10		mg/kg		0.1	28-APR-18	
Bismuth (Bi)			<0.20		mg/kg		0.2	28-APR-18	
Boron (B)			<5.0		mg/kg		5	28-APR-18	
Cadmium (Cd)			<0.020		mg/kg		0.02	28-APR-18	
Calcium (Ca)			<50		mg/kg		50	28-APR-18	
Chromium (Cr)			<0.50		mg/kg		0.5	28-APR-18	
Cobalt (Co)			<0.10		mg/kg		0.1	28-APR-18	
Copper (Cu)			<0.50		mg/kg		0.5	28-APR-18	
Iron (Fe)			<50		mg/kg		50	28-APR-18	
Lead (Pb)			<0.50		mg/kg		0.5	28-APR-18	
Lithium (Li)			<2.0		mg/kg		2	28-APR-18	
Magnesium (Mg)			<20		mg/kg		20	28-APR-18	
Manganese (Mn)			<1.0		mg/kg		1	28-APR-18	
Molybdenum (Mo)			<0.10		mg/kg		0.1	28-APR-18	
Nickel (Ni)			<0.50		mg/kg		0.5	28-APR-18	



		Workorder:	L208549	4	Report Date: 08	8-MAY-18	Pa	ige 5 of 7
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-CL	Soil							
Batch R4024936								
WG2759976-1 MB			~50		ma/ka		50	
Potossium (K)			<00		mg/kg		50	28-APR-18
Folassium (R)			<0.20		mg/kg		100	28-APR-18
Silver (Ag)			<0.20		mg/kg		0.2	28-APR-18
Solver (Ag)			<0.10		mg/kg		0.1	28-APR-18
Soululli (Na)			<0.50		mg/kg		50	28-APR-18
Subhur (Sr)			<0.50		mg/kg		0.5	28-APR-18
			<1000		mg/kg		1000	28-APR-18
Thailium (TI)			<0.050		mg/kg		0.05	28-APR-18
			<2.0		mg/kg		2	28-APR-18
			<1.0		mg/kg		1	28-APR-18
Tungsten (VV)			<0.50		mg/kg		0.5	28-APR-18
Uranium (U)			<0.050		mg/kg		0.05	28-APR-18
Vanadium (V)			<0.20		mg/kg		0.2	28-APR-18
Zinc (Zn)			<2.0		mg/kg		2	28-APR-18
Zirconium (Zr)			<1.0		mg/kg		1	28-APR-18
MOISTURE-VA	Soil							
Batch R4024764 WG2760537-2 LCS								
Moisture			100.4		%		90-110	27-APR-18
WG2760537-6 LCS								
Moisture			100.5		%		90-110	27-APR-18
WG2760537-1 MB Moisture			<0.25		%		0.25	27-APR-18
WG2760537-5 MB Moisture			<0.25		%		0.25	27-APR-18
PH-1:2-CL	Soil							
Batch R4024549								
WG2760427-3 DUP		L2085494-2						
pH (1:2 soil:water)		7.31	7.28	J	рН	0.03	0.2	27-APR-18

Workorder: L2085494

Report Date: 08-MAY-18

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Workorder: L2085494

Report Date: 08-MAY-18

Hold Time Exceedances:

	Sample						•
ALS Product Description	טו	Sampling Date	Date Processed	Rec. HI	Actual HI	Units	Qualifier
Bacteriological Tests							
Fecal coliform by MPN							
	1	25-APR-18 14:00	27-APR-18 15:00	48	49	hours	EHT
	2	25-APR-18 14:00	27-APR-18 15:00	48	49	hours	EHT

Legend & Qualifier Definitions:

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2085494 were received on 26-APR-18 08:30.

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

Environmental



L2085494-COFC

1_of __1

Report Format / Distribution Report To vailability) Company: Kicking Horse Mountain Water Utility Co. Ltd. Standard 🗍 Other Regular (Standard Turnaround Times - Business Days) Contact: Travis Jobin Digital Fax O Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT PDF Excel Address 1500 Kicking Horse Trail \bigcirc Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT Email 1: tjobin@kickinghorseresort.com 🔾 Same Day or Weekend Emergency - Contact ALS to Confirm TAT Email 2: pmajer@skircr.com Phone: 250-344-6003 Fax: Analysis Request Email 3: mskyring@kickinghorseresort.com Invoice To No No Same as Report ? Yes Please indicate below Filtered, Preserved or both (F, P, F/P) Client / Project Information Hardcopy of Invoice with Report? Yes No No Job #: RCR - Kicking Horse Mountain Resort Resorts of the Canadian Rockies PO/AFE: Company Contact: Patrick Majer LSD: of Containers Address 1505 - 17th Ave SW Calgary AB Phone: Q67622 Fax: Quote #: Lab Work Order # ALS Fecal Coliform Foreign Matter LS Sampler: ΤJ Contact: (lab use only) Number Metals Sample Sample Identification Date Time Sample Type # (This description will appear on the report) (dd-mmm-yy) (hh:mm) Х April 2018 Solids Х х 3 25-Apr-18 2pm Other April 2017 Solids Х х х 25-Apr-18 2pm Other 3 Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab. Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses. SHIPMENT RELEASE (client use) SHIPMENT RECEPTION (lab use only) SHIPMENT VERIFICATION (lab use only) Released by: Date (dd-mmm-yy) Time (hh-mm) Received by: Date: Time: Temperature: Verified by: Date: Time: Observations: Yes / No ? 24 Apr/18 Riso 15 illes °C 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:04-MAY-18Report Date:12-MAY-18 17:23 (MT)Version:DRAFT

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2089194 Project P.O. #: NOT SUBMITTED Job Reference: WEEK 3-2018 SPRING EMS PROGRAM-WW C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2089194-1 WWIP EFFLUENT-UV TROUGH							
Matrix: WATER Miscellaneous Parameters							
Ammonia Total (as N)	<0.050		0.050	ma/l		11-MAV-18	R4040670
Riochemical Oxygen Demand	3.0		2.0	mg/L		04-MAY-18	R4040070
Orthonhosphate-Dissolved (as P)	0.100		2.0	mg/L		05-MAV-18	R4039330
Coliform Bacteria - Fecal	0.100		0.010	CELI/100ml		04-MAV-18	R4033770
MPN - E coli	-1		1	MPN/100mL		04-MAV-18	R4034327
Total Suspended Solids	12.0		20	ma/l			R4034200
NO2 NO3 and Sum of NO2/NO3	12.0		5.0	ing/∟		10-10141-10	14040723
Nitrate in Water by IC Nitrate (as N)	7 81		0 020	mg/l		06-MAY-18	R4040146
	7.01		0.020	ing/E		00 10/11 10	114040140
Nitrate and Nitrite (as N)	7.84		0.050	mg/L		10-MAY-18	
Nitrite in Water by IC							
Nitrite (as N)	0.024		0.010	mg/L		06-MAY-18	R4040146
L2089194-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/MS on 03-MAY-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		11-MAY-18	R4040670
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		05-MAY-18	R4033776
Coliform Bacteria - Fecal	36		1	CFU/100mL		04-MAY-18	R4034327
MPN - E. coli	27	OCR	1	MPN/100mL		04-MAY-18	R4034288
Phosphorus (P)-Total	<0.020		0.020	mg/L	10-MAY-18	11-MAY-18	R4040920
Total Suspended Solids	24.0		3.0	mg/L		10-MAY-18	R4040725
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.184		0.020	mg/L		06-MAY-18	R4040146
Nitrate+Nitrite Nitrate and Nitrite (as N)	0 1 9 /		0.050	ma/l		10-MAV-18	
Nitrite in Water by IC	0.184		0.050	ing/∟		10-10141-10	
Nitrite (as N)	<0.010		0.010	mg/L		06-MAY-18	R4040146
L2089194-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 03-MAY-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		11-MAY-18	R4040670
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		05-MAY-18	R4033776
Coliform Bacteria - Fecal	27		1	CFU/100mL		04-MAY-18	R4034327
MPN - E. coli	8	OCR	1	MPN/100mL		04-MAY-18	R4034288
Phosphorus (P)-Total	<0.020		0.020	mg/L	10-MAY-18	11-MAY-18	R4040920
Total Suspended Solids	22.7		3.0	mg/L		10-MAY-18	R4040725
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	0.192		0.020	mg/L		06-MAY-18	R4040146
Nitrate+Nitrite Nitrate and Nitrite (as N)	0.192		0.050	mg/L		10-MAY-18	
Nitrite in Water by IC Nitrite (as N)	~0.010		0.010	mg/l		06-MAV-18	R4040146
	~0.010		0.010	iiig/ L		50 M/AT-10	117070140

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled Bv: TJ/MS on 03-MAY-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		11-MAY-18	R4040670
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		05-MAY-18	R4033776
Coliform Bacteria - Fecal	40		1	CFU/100mL		04-MAY-18	R4034327
MPN - E. coli	24	OCR	1	MPN/100mL		04-MAY-18	R4034288
Phosphorus (P)-Total	<0.020		0.020	mg/L	10-MAY-18	11-MAY-18	R4040920
Total Suspended Solids	<3.0		3.0	mg/L		10-MAY-18	R4040725
NO2, NO3 and Sum of NO2/NO3							
Nitrate In Water by IC Nitrate (as N)	0 151		0 020	ma/l		06-MAY-18	R4040146
Nitrate+Nitrite	0.101		0.020	iiig/E		00 10/11 10	114040140
Nitrate and Nitrite (as N)	0.151		0.050	mg/L		10-MAY-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		06-MAY-18	R4040146

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description		
К	Matrix Spike recovery	outside ALS DQO due to sample matrix effects	S.
OCR	Parameter is out of cl	ent specific range.	
Test Method Ro	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand dissolved oxyger BOD (CBOD) is o	carried out using procee (BOD) are determined n meter. Dissolved BOI determined by adding a	dures adapted from APHA Method 5210B - "Bio by diluting and incubating a sample for a specif D (SOLUBLE) is determined by filtering the sam a nitrification inhibitor to the diluted sample prior	chemical Oxygen Demand (BOD)". All forms of biochemical ied time period, and measuring the oxygen depletion using a ple through a glass fibre filter prior to dilution. Carbonaceous to incubation.
EC-MPN-CL	Water	MPN - E. coli	APHA 9223B
This analysis is of Substrate Colifor sample is mixed The packet is incorresponse are con probability table. Recommended H Sample: 1 day Reference: APH	carried out using procee m Test". E. coli and To with a mixture hydrolyz cubated for 18 or 24 ho unted. The final result is Holding Time:	dures adapted from APHA Method 9223 "Enzyn atal Coliform are determined simultaneously. Th table substrates and then sealed in a multi-well urs and then the number of wells exhibiting a po s obtained by comparing the positive responses	ne e packet. ositive o to a
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is o Coliform bacteria involves an initia bacteria (Fecal) a	carried out using proceed is enumerated by cult I 24 hour incubation at and is used for non-turk	dures adapted from APHA Method 9222 "Memb uring and colony counting. A known sample vol 44.5 degrees C of the filter with the appropriate pid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". ume is filtered through a 0.45 micron membrane filter. The test growth medium. This method is specific for thermotolerant
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is on of Chemistry, "Fl al.	carried out, on sulfuric a ow-injection analysis w	acid preserved samples, using procedures mod ith fluorescence detection for the determination	ified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	nromatography with conductivity and/or UV dete	ection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	nromatography with conductivity and/or UV dete	ection.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is o persulphate dige	carried out using procee stion of the sample.	dures adapted from APHA Method 4500-P "Pho	sphorus". Total Phosphorus is determined colourimetrically after
PO4-DO-COL-E	D Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c colourimetrically	carried out using procee on a sample that has b	dures adapted from APHA Method 4500-P "Pho been lab or field filtered through a 0.45 micron m	sphorus". Dissolved Orthophosphate is determined nembrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is o (TSS) are determ	carried out using procee nined by filtering a sam	dures adapted from APHA Method 2540 "Solids ple through a glass fibre filter, and by drying the	". Solids are determined gravimetrically. Total suspended solids filter at 104 deg. C.
** ALS test metho	ds may incorporate mo	difications from specified reference methods to	improve performance.
The last two lette	ers of the above test co	de(s) indicate the laboratory that performed and	alytical analysis for that test. Refer to the list below:

Laboratory Deminition Code	Laboratory Eccation
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

Reference Information

L2089194 CONTD.... PAGE 5 of 5 Version: DRAFT

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



				Quant	y contro	nicpon			
			Workorder:	L2089194	4 F	Report Date: 12-	MAY-18	Pa	ge 1 of 3
Client:	KICKING 1505 - 171 CALGAR ^N TRAVIS J	HORSE MOUNT th AVENUE SW Y AB T2T 0E2 IOBIN	FAIN UTILITY CC /	RPORATIC	DN				
Test		Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
		Wator							
BOD-BC-CL Batch R	4039338	Water							
WG2768706-2 Biochemical O	LCS bxygen Der	mand		91.1		%		85-115	04-MAY-18
WG2768706-1 Biochemical O	MB exygen Der	mand		<2.0		mg/L		2	04-MAY-18
FC-MPN-CI	,0	Water				J			011111110
Batch R	4034288	Water							
WG2766030-1 MPN - E. coli	МВ			<1		MPN/100mL		1	04-MAY-18
FCC-MF-CL		Water							
Batch R WG2766050-1 Coliform Bacte	4034327 MB eria - Fecal	I		<1		CFU/100mL		1	04-MAY-18
NH3-F-CL		Water							
Batch R	4040670								
WG2770357-6 Ammonia, Tota	LCS al (as N)			106.6		%		85-115	11-MAY-18
WG2770357-5 Ammonia, Tota	MB al (as N)			<0.050		mg/L		0.05	11-MAY-18
NO2-IC-N-CL		Water							
Batch R	4040146								
WG2769630-2 Nitrite (as N)	LCS			107.4		%		90-110	06-MAY-18
WG2769630-1 Nitrite (as N)	MB			<0.010		mg/L		0.01	06-MAY-18
NO3-IC-N-CL		Water							
Batch R WG2769630-2	4040146 LCS								
Nitrate (as N)	MB			102.8		%		90-110	06-MAY-18
Nitrate (as N)				<0.020		mg/L		0.02	06-MAY-18
P-T-COL-ED		Water							
Batch R WG2769722-2	4040920 LCS		KONELAB_TP	105 1		9/		00.100	
WG2769722-1	MB			105.1		70		80-120	11-MAY-18



	Workorder:	L2089194	4 R	eport Date: 7	12-MAY-18	Pa	ge 2 of 3
Test Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-ED Water							
Batch R4040920							
WG2769722-1 MB Phosphorus (P)-Total		<0.020		mg/L		0.02	11-MAY-18
PO4-DO-COL-ED Water							
Batch R4033776							
WG2765638-2 LCS Orthophosphate-Dissolved (as P)		105.6		%		70-130	05-MAY-18
WG2765638-4 LCS Orthophosphate-Dissolved (as P)		112.8		%		70-130	05-MAY-18
WG2765638-1 MB Orthophosphate-Dissolved (as P)		<0.010		mg/L		0.01	05-MAY-18
WG2765638-3 MB Orthophosphate-Dissolved (as P)		<0.010		mg/L		0.01	05-MAY-18
TSS-CL Water							
Batch R4040725							
WG2769503-2 LCS Total Suspended Solids		93.3		%		85-115	10-MAV-18
WG2769503-1 MB				,,,		00 110	10-10/10
Total Suspended Solids	(<3.0	,	mg/L		3	10-MAY-18

Workorder: L2089194

Report Date: 12-MAY-18

Legend:

Limit	ALS Co	ntrol Limit (Data Quality Objectives)
DUP	Duplica	ate
RPD	Relativ	e Percent Difference
N/A	Not Av	<i>r</i> ailable
LCS	Labora	tory Control Sample
SRM	Standa	rd Reference Material
MS	Matrix	Spike
MSD	Matrix	Spike Duplicate
ADE	Averag	ge Desorption Efficiency
MB	Metho	d Blank
IRM	Interna	al Reference Material
CRM	Certifie	ed Reference Material
CCV	Contin	uing Calibration Verification
CVS	Calibra	ation Verification Standard
LCSD	Labora	tory Control Sample Duplicate
Sample F	Paramet	er Qualifier Definitions:
Qualifi	ier	Description
RPD-N	JA	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.

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

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ALS Environmental

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

COC #

Report To				Report Fo	rmat / Distribut	ion		Serv	ice R	eques	sted (F	Rush f	or rou	tine at	nalysis	subje	ct to av	ailabilin	y)
Company: Kicking H	orse Mountain Resort	Utility Corporation		Standard Other					Regular (Standard Turnaround Times - Business Days)										
Contact: Travis Jol	pin			PDF Excel Digital 🖓 Fax O Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TA							firm TAT								
Address: 1500 Kick	ing Horse Trail			Email 1: tjobin@kickinghorseresort.com					C Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT										
	Email 2: <u>pmajer@skircr.com</u>						O Same Day or Weekend Emergency - Contact ALS to Confirm TAT												
Phone: 250-344-8	3442 F	ax:		Email 3: mskyring@kickinghorseresort.com Analy						nalys	alysis Request								
Invoice To Same as	Report ? 🗌 Yes	🗾 🔽 No		Client / Pr	oject Informatio	on		Please indicate below Filtered, Preserved or both (F, P, F/P)											
Hardcopy of Invoice with	Report? Yes	No No		Job #:	Week 3 - 2018	Spring EMS pro	gram - WW										$ \rightarrow $		_
Company: Resorts o	f the Canadian Rockie	es		PO / AFE:															
Contact: Patrick M	ajer			LSD:									ļ				1		6
Address: 1505 - 17	th Ave SW Calgary A	B								•									ner
Phone:	F	ax:		Quote #:									1]		ntai
Lab Work Order				ALS Contact:	LS	Sampler:	TJ/MS								aliform	S			r of Co
Sample M	Samp (This descriptio	ble Identification n will appear on th	e report)	•	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-N03	N-N02	Total P	Ortho P	Fecal C	Enteroc	E Coli		Numbe
WWTP E	ffluent - UV trough	Temp: 🔂 p	н: 6.8		MAY 3, 18	2:00 PM	Water	X	X	X	x	x	X	X	X	X	X	-	5
Columbia	River Upstream	Temp: 17.	pH: 7.8		MAY 3 18	3:00 PM	Water		Х	Х	X	X	X	X	X	X	X		4
Columbia	River Down stream	Temp: 12	pH: 7, 9		MAY 3.18	3:00 PM	Water		X	X	x	x	x	x	x	x	x	1	4
Columbia	River Side Channel	Temp: (기	pH: 7,8		M443/18	3:00 PM	Water		х	X	X	X	X	X	X	X	x		4
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				<u> </u>				-											•
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Also p	rovided on another E	Excel tab are the	ALS locatio	n addresse:	s, phone numbe	ers and sample	container / prese	rvatio	on / he constan	olaine	j time Jiowa		e tor	COM	non a	nalys	ies.	Nedera -	
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GENF 20.00 Front



Microbial Test Results

Samples collected May 3, 2018

Final Report

May 16, 2018

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

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



SAMPLE INFORMATION

Samuela ID (Dates		Dessint	
Internal ID	Collected	Enterococcus test initiation	temperature		
L2089194-1 WWTP EFFLUENT-UV TROUGH/	03-May-18 at	03-May-18 at 04-May-18 at 04-M		11°C	
1718-1046-01	140011	10-1011	12-1011		
L2089194-2 COLUMBIA RIVER UPSTREAM/	03-May-18 at	04-May-18 at	04-May-18 at	11°C	
1718-1046-02	190011	104011	124011		
L2089194-3 COLUMBIA RIVER DOWN STREAM/	03-May-18 at	04-May-18 at	04-May-18 at 1240b	11°C	
1718-1046-03	190011	10 1011	12 1011		
L2089194-4 COLUMBIA RIVER SIDE CHANNEL/	03-May-18 at	04-May-18 at	04-May-18 at	11°C	
1718-1046-04	130011	104011	124011		

TEST TYPES

• Enterococcus enumeration test

RESULTS

Microbial test results

Samula ID	MPN/100 mL
Sample ID	Enterococcus
L2089194-1 WWTP EFFLUENT-UV TROUGH	<1
L2089194-2 COLUMBIA RIVER UPSTREAM	5.2
L2089194-3 COLUMBIA RIVER DOWN STREAM	4.1
L2089194-4 COLUMBIA RIVER SIDE CHANNEL	4.1

MPN = Most Probable Number



QA/QC

QA/QC summary	Total Coliforms/ <i>E</i> . <i>coli</i>	Enterococcus	Pseudomonas	Heterotrophic bacteria
Protocol deviations	None	None	None	None
Control performance	Acceptable	Acceptable	Acceptable	Acceptable
Test performance	Valid	Valid	Valid	Valid



tio

Report By: Courtney Bogstie, BSc Biologist

statevet

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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



APPENDIX A – Test data
	Quant	i-Tray Ben	ich Sheet - E	nterococcu
		Client ALS	Ole Reference	118-1046
Reagent	agent used: Enterolert Lot#/Expiry: <u>FN</u> S	1321 MAY 18,20	Sample Information Dilution Factor:	1
Quant	i Tray 2000 Lot#/Expiry	: GINEY7/07,	10/2020	
1245	- Technician	s (B		
		Interococci (Fluoresce	rt)	
	-02 -03	404		
0	2	- c		
0	0	0		
0	0	0		
17 17	5.2 H.I	4.1		
	_ Technician			
Ð		Enterococci (Fluorescei	nt)	
	CT. 1245 Quant CT. 2000 CT. 20	Reagent used: Enterolerti Reagent Lot#/Expiry: $Enterolerti Reagent Lot#/Expiry: Enterolerti Quanti Tray 2000 Lot#/Expiry Technician 0 0 0 0 0 5 3 0 0 5 3 0 0 5 2 1245 Technician Technician 1245 5 3 0 0 5 3 0 0 5 2 1245 Technician Technician $	Guanti-Tray Ben Client ALSI Reagent used: Enterolert [™] Reagent Lot#/Expiry: $\underline{FNSZRI MAT 48, 74}$ Quanti Tray 2000 Lot#/Expiry: $\underline{CnAb47107}$ CnAb47107 Quanti Tray 2000 Lot#/Expiry: $\underline{CnAb47107}$ Interococci (Fluorescer CnL Technician: Technician: Technician: Technician: Technician: Technician: Technician: Enterococci (Fluorescer CTL Technician:	Client ALS OC Reference I Sample Information Reagent used: Enterolert ^m Dilution Factor: Comments: Ouanti Tray 2000 Lot#/Expiny: Ctr_Mb4/7 1 D 71/10/20 Z0 Enterococci (Fluorescent) Technician: Enterococci (Fluorescent) Enterococci (Fluorescent) Enterococci (Fluorescent)

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

Nautilus Environmental (Calgary)



APPENDIX B – Chain-of-custody form



CALGARY

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

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

NOTES: Please reference on final ALS requires QC data to	report and invoice: PO# <u>L208</u> be provided with your final results	<u>9194</u>	
Please see enclosed <u>4</u> san	nple(s) in <u>4</u> Container(s)		
NUMBER 1718 - 1046 ANALYT	CAL REQUIRED	DATE SAMPLED DUE DATE	Priority Flag
L2089194-1 WWTP EFFLUENT-UV	61	5/3/2018	
Enterococ	cus (ENTERO-HQ 1) -07	5/16/2018	
L2089194-2 COLUMBIA RIVER	0	5/3/2018	
Enterococ	cus (ENTERO-HQ 1) -OZ	5/11/2018	
L2089194-3 COLUMBIA RIVER DOWN	1	5/3/2018	
Enterococ	cus (ENTERO-HQ 1)	5/11/2018	
L2089194-4 COLUMBIA RIVER SIDE CHANNEL Enterococ	cus (ENTERO-HQ 1) - 04	5/ 3/ 2018 5/11/2018	
Subcontract Info Contact:	John Forbes (403) 291-9897		
nalysis and reporting info contact:	Nancy Sonompil, B. Sc. 2559 29 STREET NE		
	CALGARY, AB T1Y 7B5		
	Phone: (403) 291-9897	Email: Nancy.Sonompil@al	sglobal.com
lease email confirmation of rece	ipt to: Nancy.Sonompi	@alsglobal.com	
hipped By: Drop OF	FDate Shipped:	4x200ML	Bottle
eceived By: <u>DY</u>	Date Received:	2018/05/01	1
erified By: NOSIT	Date Verified:	1.1.00	
1.1	Temperature:	102	
ample Integrity Issues:	Ud		



END OF REPORT



KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received: 10-MAY-18 Report Date: 23-MAY-18 15:58 (MT) Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2092146 Project P.O. #: NOT SUBMITTED Job Reference: WEEK 4 - 2018 SPRING 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

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: T I/MS on 09-MAY-18 @ 14:00							
Matrix: MATED							
Miscellaneous Parameters							
Ammonia. Total (as N)	<0.050		0.050	ma/L		16-MAY-18	R4046049
Biochemical Oxygen Demand	<20		2.0	ma/l		10-MAY-18	R4044420
Orthophosphate-Dissolved (as P)	0.052		0.010	mg/L		11-MAY-18	R4040862
Enterococcus	See Attached		0.010			10-MAY-18	R4053931
Coliform Bacteria - Fecal			1	CFU/100ml		10-MAY-18	R4040923
MPN - E coli	~1		1	MPN/100mL		10-MAY-18	R4040920
Phosphorus (P)-Total	0 124		0 020	ma/l	16-MAY-18	17-MAY-18	R4047075
Total Suspended Solids	63		3.0	ma/l		15-MAY-18	R4045881
NO2. NO3 and Sum of NO2/NO3	0.5		0.0	iiig/ E			114040001
Nitrate in Water by IC							
Nitrate (as N)	6.00		0.020	mg/L		12-MAY-18	R4041541
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	6.02		0.050	mg/L		13-MAY-18	
Nitrite in Water by IC							
Nitrite (as N)	0.016		0.010	mg/L		12-MAY-18	R4041541
L2092146-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/MS on 09-MAY-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		16-MAY-18	R4046049
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		11-MAY-18	R4040862
Enterococcus	See Attached					10-MAY-18	R4053931
Coliform Bacteria - Fecal	11		1	CFU/100mL		10-MAY-18	R4040923
MPN - E. coli	10	OCR	1	MPN/100mL		10-MAY-18	R4040904
Phosphorus (P)-Total	0.061		0.020	mg/L	16-MAY-18	17-MAY-18	R4047075
Total Suspended Solids	120		3.0	mg/L		15-MAY-18	R4045881
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.222		0.020	mg/L		12-MAY-18	R4041541
Nitrate+Nitrite Nitrate and Nitrite (as N)	0 222		0.050	ma/l		13-MAV-18	
Nitrite in Water by IC	0.222		0.000	ing/E		10-10-10	
Nitrite (as N)	<0.010		0.010	mg/L		12-MAY-18	R4041541
L2092146-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 09-MAY-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		16-MAY-18	R4046049
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		11-MAY-18	R4040862
Enterococcus	See Attached			0		10-MAY-18	R4053931
Coliform Bacteria - Fecal	13		1	CFU/100ml		10-MAY-18	R4040923
MPN - E. coli	2	OCR	1	MPN/100ml		10-MAY-18	R4040904
Phosphorus (P)-Total	0.094		0.020	ma/L	16-MAY-18	17-MAY-18	R4047075
Total Suspended Solids	214		3.0	ma/l		15-MAY-18	R4045881
NO2, NO3 and Sum of NO2/NO3			0.0	.			
Nitrate in Water by IC							
Nitrate (as N)	0.240		0.020	mg/L		12-MAY-18	R4041541
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.240		0.050	mg/L		13-MAY-18	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: TJ/MS on 09-MAY-18 @ 15:00							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		12-MAY-18	R4041541
L2092146-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ/MS on 09-MAY-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters	<0.050		0.050	ma/l		16-MAV-18	P4046040
Orthophosphate-Dissolved (as P)	<0.030		0.030	mg/L		11-MAY-18	R4040049 R4040862
Enterococcus	See Attached		0.010			10-MAY-18	R4053931
Coliform Bacteria - Fecal	41		1	CFU/100mL		10-MAY-18	R4040923
MPN - E. coli	16	OCR	1	MPN/100mL		10-MAY-18	R4040904
Phosphorus (P)-Total	0.044		0.020	mg/L	16-MAY-18	17-MAY-18	R4047075
Total Suspended Solids	81.7		3.0	mg/L		15-MAY-18	R4045881
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	0.017		0 020	mall		12-M∆V 19	P/0/15/1
	0.217		0.020	ing/∟		12-IVIA 1-10	R4041541
Nitrate and Nitrite (as N)	0.217		0.050	mg/L		13-MAY-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		12-MAY-18	R4041541

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

Reference Information

Sample Parameter Qualifier Key:

OCR Param Test Method Reference ALS Test Code BOD-BC-CL This analysis is carried co oxygen demand (BOD) a dissolved oxygen meter. BOD (CBOD) is determine EC-MPN-CL This analysis is carried co Substrate Coliform Test" sample is mixed with a n The packet is incubated response are counted. T probability table. Recommended Holding Sample: 1 day Reference: APHA FCC-MF-CL This analysis is carried co Coliform bacteria is enur involves an initial 24 hou bacteria (Fecal) and is u N2N3-CALC-CL NH3-F-CL This analysis is carried co of Chemistry, "Flow-inject al. NO2-IC-N-CL	eter is out of o ces: Matrix Water Dut using proc are determiner Dissolved BC ned by adding Water Dut using proc '. E. coli and T nixture hydroly for 18 or 24 h 'he final result Time: Water Dut using proc merated by cu ur incubation a sed for non-tu Water	Client specific range. Test Description Biochemical Oxygen Demand (BOD) edures adapted from APHA Method 5210B - "B d by diluting and incubating a sample for a spec DD (SOLUBLE) is determined by filtering the sa g a nitrification inhibitor to the diluted sample priot MPN - E. coli edures adapted from APHA Method 9223 "Enzy Fotal Coliform are determined simultaneously. T yzable substrates and then sealed in a multi-we is obtained by comparing the positive response Fecal Coliform Count-MF edures adapted from APHA Method 9222 "Mem ilturing and colony counting. A known sample vi at 44.5 degrees C of the filter with the appropriat arbid water with a low background bacteria level	Method Reference** APHA 5210 B-5 day IncubO2 electrode iochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a mple through a glass fibre filter prior to dilution. Carbonaceous or to incubation. APHA 9223B /me The Il packet. positive es to a APHA 9222D hbrane Filter Technique for Members of the Coliform Group". obume is filtered through a 0.45 micron membrane filter. The test te growth medium. This method is specific for thermotolerant
Fest Method Reference ALS Test Code BOD-BC-CL This analysis is carried of oxygen demand (BOD) a dissolved oxygen meter. BOD (CBOD) is determine EC-MPN-CL This analysis is carried of Substrate Coliform Test" sample is mixed with a m The packet is incubated response are counted. T probability table. Recommended Holding Sample: 1 day Reference: APHA FCC-MF-CL This analysis is carried of Coliform bacteria is enur involves an initial 24 hou bacteria (Fecal) and is u N2N3-CALC-CL NH3-F-CL This analysis is carried of of Chemistry, "Flow-injeo al. NO2-IC-N-CL	Matrix Water Dut using proc are determiner Dissolved BC ned by adding Water Dut using proc '. E. coli and T nixture hydroly for 18 or 24 h 'he final result Time: Water Dut using proc merated by cu ir incubation a sed for non-tu Water	Test Description Biochemical Oxygen Demand (BOD) edures adapted from APHA Method 5210B - "B d by diluting and incubating a sample for a spect DD (SOLUBLE) is determined by filtering the sample prior g a nitrification inhibitor to the diluted sample prior MPN - E. coli edures adapted from APHA Method 9223 "Enzy Total Coliform are determined simultaneously. T ryzable substrates and then sealed in a multi-we iours and then the number of wells exhibiting a prior t is obtained by comparing the positive response Fecal Coliform Count-MF edures adapted from APHA Method 9222 "Memulturing and colony counting. A known sample wat 44.5 degrees C of the filter with the appropriat utd 44.5 degrees C of the filter with the appropriat utd vater with a low background bacteria level	Method Reference** APHA 5210 B-5 day IncubO2 electrode iochemical Oxygen Demand (BOD)". All forms of biochemical iffied time period, and measuring the oxygen depletion using a mple through a glass fibre filter prior to dilution. Carbonaceous or to incubation. APHA 9223B /me The Il packet. positive es to a APHA 9222D hbrane Filter Technique for Members of the Coliform Group". polume is filtered through a 0.45 micron membrane filter. The test te growth medium. This method is specific for thermotolerant to the growth medium.
ALS Test Code BOD-BC-CL This analysis is carried of oxygen demand (BOD) a dissolved oxygen meter. BOD (CBOD) is determine EC-MPN-CL This analysis is carried of Substrate Coliform Test" sample is mixed with a n The packet is incubated response are counted. T probability table. Recommended Holding Sample: 1 day Reference: APHA FCC-MF-CL This analysis is carried of Coliform bacteria is enur involves an initial 24 hou bacteria (Fecal) and is u N2N3-CALC-CL NH3-F-CL This analysis is carried of of Chemistry, "Flow-injeo al. NO2-IC-N-CL	Matrix Water Dissolved BC ned by adding Water but using proc '. E. coli and T nixture hydroly for 18 or 24 h 'he final result Time: Water but using proc merated by cu ir incubation a sed for non-tu Water	Test Description Biochemical Oxygen Demand (BOD) edures adapted from APHA Method 5210B - "B d by diluting and incubating a sample for a spec DD (SOLUBLE) is determined by filtering the sa g a nitrification inhibitor to the diluted sample prior MPN - E. coli edures adapted from APHA Method 9223 "Enzy Total Coliform are determined simultaneously. T yzable substrates and then sealed in a multi-we is obtained by comparing the positive response Fecal Coliform Count-MF edures adapted from APHA Method 9222 "Mem Ituring and colony counting. A known sample vi at 44.5 degrees C of the filter with the appropriat irbid water with a low background bacteria level	Method Reference** APHA 5210 B-5 day IncubO2 electrode iochemical Oxygen Demand (BOD)". All forms of biochemical cified time period, and measuring the oxygen depletion using a mple through a glass fibre filter prior to dilution. Carbonaceous or to incubation. APHA 9223B //me //me //me //me //me //me //me //m
BOD-BC-CL This analysis is carried of oxygen demand (BOD) a dissolved oxygen meter. BOD (CBOD) is determin EC-MPN-CL This analysis is carried of Substrate Coliform Test" sample is mixed with a m The packet is incubated response are counted. T probability table. Recommended Holding Sample: 1 day Reference: APHA FCC-MF-CL This analysis is carried of Coliform bacteria is enur involves an initial 24 hou bacteria (Fecal) and is u N2N3-CALC-CL NH3-F-CL This analysis is carried of of Chemistry, "Flow-injeo al.	Water but using proc are determined Dissolved BC ned by adding Water but using proc '. E. coli and T nixture hydroly for 18 or 24 h 'he final result Time: Water but using proc merated by cu ir incubation a sed for non-tu Water	Biochemical Oxygen Demand (BOD) edures adapted from APHA Method 5210B - "B d by diluting and incubating a sample for a spec DD (SOLUBLE) is determined by filtering the sa g a nitrification inhibitor to the diluted sample pri- MPN - E. coli edures adapted from APHA Method 9223 "Enzy Total Coliform are determined simultaneously. T yzable substrates and then sealed in a multi-we iours and then the number of wells exhibiting a p t is obtained by comparing the positive response Fecal Coliform Count-MF edures adapted from APHA Method 9222 "Mem ilturing and colony counting. A known sample we at 44.5 degrees C of the filter with the appropriat urbid water with a low background bacteria level	APHA 5210 B-5 day IncubO2 electrode iochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a mple through a glass fibre filter prior to dilution. Carbonaceous or to incubation. APHA 9223B yme 'he Il packet. positive es to a APHA 9222D horane Filter Technique for Members of the Coliform Group". olume is filtered through a 0.45 micron membrane filter. The test es growth medium. This method is specific for thermotolerant
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EC-MPN-CL This analysis is carried of Substrate Coliform Test" sample is mixed with a n The packet is incubated response are counted. T probability table. Recommended Holding Sample: 1 day Reference: APHA FCC-MF-CL This analysis is carried of Coliform bacteria is enur involves an initial 24 hou bacteria (Fecal) and is u N2N3-CALC-CL NH3-F-CL This analysis is carried of of Chemistry, "Flow-injeo al.	Water but using proc '. E. coli and T nixture hydroly for 18 or 24 h 'he final result Time: Water Water but using proc merated by cu ir incubation a sed for non-tu Water	MPN - E. coli edures adapted from APHA Method 9223 "Enzy Total Coliform are determined simultaneously. T yzable substrates and then sealed in a multi-we iours and then the number of wells exhibiting a is obtained by comparing the positive response Fecal Coliform Count-MF edures adapted from APHA Method 9222 "Mem ulturing and colony counting. A known sample we at 44.5 degrees C of the filter with the appropriat urbid water with a low background bacteria level	APHA 9223B me he Il packet. positive es to a APHA 9222D hbrane Filter Technique for Members of the Coliform Group". plume is filtered through a 0.45 micron membrane filter. The test te growth medium. This method is specific for thermotolerant
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FCC-MF-CL This analysis is carried of Coliform bacteria is enur involves an initial 24 hou bacteria (Fecal) and is u N2N3-CALC-CL NH3-F-CL This analysis is carried of of Chemistry, "Flow-injeo al. NO2-IC-N-CL	Water but using proc merated by cu ir incubation a sed for non-tu Water	Fecal Coliform Count-MF edures adapted from APHA Method 9222 "Mem ilturing and colony counting. A known sample vo at 44.5 degrees C of the filter with the appropriat irbid water with a low background bacteria level	APHA 9222D abrane Filter Technique for Members of the Coliform Group". Solume is filtered through a 0.45 micron membrane filter. The test are growth medium. This method is specific for thermotolerant
This analysis is carried of Coliform bacteria is enur involves an initial 24 hou bacteria (Fecal) and is u N2N3-CALC-CL NH3-F-CL This analysis is carried of of Chemistry, "Flow-injeo al. NO2-IC-N-CL	out using proc merated by cu ir incubation a sed for non-tu Water	edures adapted from APHA Method 9222 "Merr lituring and colony counting. A known sample vo at 44.5 degrees C of the filter with the appropriat urbid water with a low background bacteria level	nbrane Filter Technique for Members of the Coliform Group". Jolume is filtered through a 0.45 micron membrane filter. The test re growth medium. This method is specific for thermotolerant
N2N3-CALC-CL NH3-F-CL This analysis is carried c of Chemistry, "Flow-injec al. NO2-IC-N-CL	Water	Nitroto i Nitrito	
NH3-F-CL This analysis is carried c of Chemistry, "Flow-injec al. NO2-IC-N-CL		Milale+Millile	CALCULATION
This analysis is carried of of Chemistry, "Flow-inject al. NO2-IC-N-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
NO2-IC-N-CL	out, on sulfuric ction analysis	c acid preserved samples, using procedures mo with fluorescence detection for the determination	dified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society on of trace levels of ammonium in seawater", Roslyn J. Waston et
	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are ana	alyzed by Ion (Chromatography with conductivity and/or UV de	tection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are ana	alyzed by Ion (Chromatography with conductivity and/or UV de	tection.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried of persulphate digestion of	out using proc the sample.	edures adapted from APHA Method 4500-P "Pt	nosphorus". Total Phosphorus is determined colourimetrically after
PO4-DO-COL-ED	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried of colourimetrically on a sa	out using proc mple that has	edures adapted from APHA Method 4500-P "Ph been lab or field filtered through a 0.45 micron	nosphorus". Dissolved Orthophosphate is determined membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is carried of (TSS) are determined by	out using proc / filtering a sa	edures adapted from APHA Method 2540 "Solid mple through a glass fibre filter, and by drying th	ds". Solids are determined gravimetrically. Total suspended solids ne filter at 104 deg. C.
* ALS test methods may	incorporate m	nodifications from specified reference methods t	o improve performance.

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



Nitrate (as N)

WG2771267-1

Nitrate (as N)

MB

Quality Control Report Workorder: L2092146 Report Date: 23-MAY-18 Page 1 of 3 KICKING HORSE MOUNTAIN UTILITY CORPORATION Client: 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 TRAVIS JOBIN Contact: RPD Test Matrix Reference Result Qualifier Units Limit Analyzed BOD-BC-CL Water Batch R4044420 WG2773037-2 LCS **Biochemical Oxygen Demand** 93.9 % 85-115 10-MAY-18 WG2773037-1 MB **Biochemical Oxygen Demand** <2.0 2 mg/L 10-MAY-18 EC-MPN-CL Water Batch R4040904 WG2770556-1 MB MPN/100mL MPN - E. coli <1 1 10-MAY-18 WG2770556-4 MR MPN - E. coli <1 MPN/100mL 1 10-MAY-18 FCC-MF-CL Water Batch R4040923 WG2770577-1 MB Coliform Bacteria - Fecal <1 CFU/100mL 1 10-MAY-18 NH3-F-CL Water Batch R4046049 WG2773952-19 DUP L2092146-4 Ammonia, Total (as N) < 0.050 < 0.050 mg/L N/A **RPD-NA** 20 16-MAY-18 WG2773952-18 LCS 104.1 % Ammonia, Total (as N) 85-115 16-MAY-18 WG2773952-17 MB Ammonia, Total (as N) < 0.050 mg/L 0.05 16-MAY-18 WG2773952-20 MS L2092146-4 124.2 Ammonia, Total (as N) % 75-125 16-MAY-18 NO2-IC-N-CL Water R4041541 Batch WG2771267-2 LCS Nitrite (as N) 102.3 % 90-110 12-MAY-18 WG2771267-1 MB <0.010 Nitrite (as N) mg/L 0.01 12-MAY-18 NO3-IC-N-CL Water Batch R4041541 WG2771267-2 LCS

98.1

<0.020

%

mg/L

90-110

0.02

12-MAY-18

12-MAY-18



		Workorder:	L209214	ŀ6	Report Date: 2	3-MAY-18	Pa	ige 2 of 3
Test	Matrix	Reference	Result	Qualifier	Units	Units RPD		Analyzed
P-T-COL-ED	Water							
Batch R4047075 WG2774229-6 LCS Phosphorus (P)-Total		KONELAB_1	99.2		%		80-120	17-MAY-18
WG2774229-5 MB Phosphorus (P)-Total			<0.020		mg/L		0.02	17-MAY-18
TSS-CL	Water							
Batch R4045881 WG2773167-2 LCS Total Suspended Solids			92.7		%		85-115	15-MAY-18
WG2773167-1 MB Total Suspended Solids			<3.0		mg/L		3	15-MAY-18

Workorder: L2092146

Report Date: 23-MAY-18

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
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.





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

COC #

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

Report To Eport Format Disfribution Service Requested (Rush for routine analysis addicts a compary. Solution in the interview of the					<u> </u>		1.											
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Contact Tarvis John Lipor Demoty 1: 90% Surdays 2: Contact ALS to 20% Address: 1500 Mixing Horse Trail Email 1: bioPhiloRichinghosteresont com O Enregency 1: 48.: 00% OB Surdays 2:	Company:	Kicking Horse Mountain Resort Utility Corporation	Standard	Standard Other Regular (Standard Turnaround Times - Business Days)														
Address 1600 Kidong Horse Trail Enail 1: toping/edic/indindic/indindindic/indindic/indic/indic/indindindic/indic/indic/ind	Contact:	Travis Jobin	PDF	Excel	Digital	Fax	O Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm 1A1											
Email 2 protect 20:344-6442 Fax: Famil 2 protect 20:346-6442 Fax: Control ALS is Column 74 Invoice 10 Same as Report 7 Invoice 10 The 20:344-6442 Fax: Control ALS is Column 74 Preserved or both (F. Invoice 10 Same as Report 7 Invoice 10 The 20:16 Client 1P roject information Please indicate below Filtered, Preserved or both (F. Company: Resorts of the Canadian Rockies PO / AFE Point 10:00 Preserved or both (F. Contact: Patick Majer LSD: Address: 10:00 + # Invoice 10:00 Address: 10:00 + # ALS Contact: Sampler: TUMS TUMS Visit on trip: Sample Identification Dute: Time Sampler: TUMS TUMS Visit on trip: Sample Identification Dute: Time Sampler: TUMS TUMS Tume Sampler: TUMS TuMS Tume Sampler:	Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickingh	orseresort.com	<u>]</u>	O Emergency (1-2 Bus, Days) - 100% Surcharge - Contact ALS to Confirm											
Phone: 250-344.842 Fax: Email 3: makyring/Biokiding/brosered/com Please indicate below Filtered, Preserved of both F. Hardcopy of Invaice with Report? 1 vs			Email 2:	pmajer@skircr.@	<u>com</u>		() Sa	me Da	y or We	ekend	Emerg	ency -	Contac	t ALS ti	o Confi	rm ⊺AT		
Invoice To Same as Report ? Itse Itse count information Please information Please information Plancing of Invoice with Report ? Itse Jub & Week 4 - 2018 Spring EMS program - WW Plancing of Invoice with Report ? Itse	Phone:	250-344-8442 Fax:	Email 3:	mskyring@kicki	nghorseresort.	<u>com</u>	 				A	nalys	sis Re	eques	st			
Hardcopy of Involae with Report? I'se. Job #. Week 4 - 2018 Spring EMS program - WWV Company. Restrict of the Canadian Rockles. PO/ AFE Italian Spring EMS program - WWV Contact: Patrick Majer LSD. Address: 1656 - 17Th Ave SWC Calgary AtB Italian Spring EMS program - WWV Phone: Fax. Quole #. Lab Work Order # ALS Contact: LS Sysample? Time Contact: LS Sample Type WWTP Effluent - UV trough Temp: Ø, J. pH: 7, 6 May 7, 1/B Z/M Water X <td< td=""><td>Invoice To</td><td>Same as Report ? Yes Vo</td><td>Client / Pr</td><td>oject Informatio</td><td>on</td><td></td><td>Ple</td><td>ease i</td><td>ndica</td><td>e bel</td><td>ow Fil</td><td>tered</td><td>, Pres</td><td>erveo</td><td>i or b</td><td>oth (F</td><td><u>, P, F/</u></td><td><u>P) '</u></td></td<>	Invoice To	Same as Report ? Yes Vo	Client / Pr	oject Informatio	on		Ple	ease i	ndica	e bel	ow Fil	tered	, Pres	erveo	i or b	oth (F	<u>, P, F/</u>	<u>P) '</u>
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Contact: Patrick Migler LSD: Address: 1505 - 17th Ave SW Calgary AB Phone: Fax: Quote #: Lab Work Order # ALS Sysample: TUMS Sysample: Tume (This description will appear on the report) Contact: Columbia River Dystream Temp: 9, 1, PH: 7, 6 (Columbia River Dystream Temp: 9, 1, PH: 7, 6 (Columbia River Dystream Temp: 9, 1, PH: 7, 6 (Columbia River Dystream Temp: 1, 0 (Columbia River Side Channel Temp: 1, 0	Company;	Resorts of the Canadian Rockies	PO / AFE:															
Address: 1505 - 17th Ave SW Calgary AB Phone: Fax: Quote #. Lab. Work Order # ALS Contact: LS Sample Identification Date (Ith buse only) Sample Identification (Ith description will appear on the report) (eth.mmy) (Ith description will appear on the report) (fig. 3.P.M. (Ith description will appear on the report) (fig. 3.P.M. (Ith description will appear on the report) (fig. 3.P.M. (Ith description will appear on the report) (fig. 3.P.M. (Ith description will appear on the report) (fig. 3.P.M. <t< td=""><td>Contact:</td><td>Patrick Majer</td><td>LSD:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Contact:	Patrick Majer	LSD:															
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WWTP Effluent - UV trough Temp: 8,4 pH: 6,3 MAY 9,18 Z PM Water X	Sample	Sample Identification (This description will appear on the report)	-	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-NO2	Total P	Ortho F	Fecal (Entero	E. Coli		Quun
Columbia River Upstream Temp: 9: pH: 7.6 MAY 1 R ZPM Water X		WWTP Effluent - UV trough Temp: 8,4 pH: 6,8		May 9 18	7PM	Water	X	X	Х	Х	Х	Х	X	X	Х	X		5
Columbia River Down stream Temp: []. [pt 7 g Max 9 ig 3 pm Water X		Columbia River Upstream Temp: 9 pH: 7,9		MAU9 10	ZPM	Water		X	X	X	Х	Х	X	X	X	X		4
Columbia River Side Channel Temp: [0.0 pH: 7,8 // Ax 7 10 3 f/M Water X		Columbia River Down stream Temp: [[, [pH: 7 g]		MAX9 1A	3PM	Water		x	X	X	X	Х	X	X	X	X		4
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab. Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses. SHIPMENT RELEASE (client use) Released by: Date (ds-mm-yr) Time: Verified by: Date: Time:		Columbia River Side Channel Temp: [(), () pH: 7, 8		1/44 9'18	3PM	Water		X	X	X	Х	Х	X	Х	Х	X		4
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GENF 20.00 Front



Microbial Test Results

Samples collected May 9, 2018

Final Report

May 23, 2018

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

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



SAMPLE INFORMATION

Sample ID/		Dates	Dessint	
Internal ID	Collected	Received	Enterococcus test initiation	temperature
L2092146-1 WWTP EFFLUENT – UV TROUGH/	09-May-18 at 1400h	10-May-18 at 1225h	10-May-18 at 1315h	11.7°C
1718-1082-01				
L2092146-2 Columbia River Upstream/	09-May-18 at 1500h	10-May-18 at 1225h	10-May-18 at 1315h	11.9°C
1718-1082-02				
L2092146-3 COLUMBIA RIVER DOWN STREAM/	09-May-18 at 1500h	10-May-18 at 1225h	10-May-18 at 1315h	10.9°C
1718-1082-03				
L2092146-4 COLUMBIA RIVER SIDE CHANNEL/	09-May-18 at 1500h	10-May-18 at 1225h	10-May-18 at 1315h	11.6°C
1718-1082-04				

TEST TYPES

• *Enterococcus* enumeration test

RESULTS

Microbial test results

Samula ID	MPN/100 mL
	Enterococcus
L2092146-1 WWTP EFFLUENT – UV TROUGH	<1
L2092146-2 COLUMBIA RIVER UPSTREAM	3.0
L2092146-3 COLUMBIA RIVER DOWN STREAM	4.1
L2092146-4 COLUMBIA RIVER SIDE CHANNEL	9.7

MPN = Most Probable Number



QA/QC

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



tio

Desplant

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

Report By:

Biologist

Courtney Bogstie, BSc

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



APPENDIX B – Chain-of-custody form



L2092146

CALGARY

Subcontract	Doquact	Form
Subcontract	Request	FORM

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

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

082 TICAL REQUIRED	DATE SAMPLED	
	DUE DATE	Priority Flag
coccus (ENTERO-HQ 1)	Du 5/9/2018 2pr 5/17/2018	-01
соссия (ENTERO-HQ 1) //. 9 С	5/9/2018 3pn 5/17/2018	- 02
NN COCCUS (ENTERO-HQ 1)	5/9/2018 2 3pm 5/17/2018 =	+03
COCCUS (ENTERO-HQ 1)	C 3pm 5/17/2018	-04
John Forbes (403) 291-9897		
Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897	Email: Nancy.Sonompil@als	global.com
ceipt to: Nancy.Sonompil	l@alsglobal.com	
Date Shipped:	4×200ML Bot	tles
Date Received:	208/05/06/	0 12:
Date Verified:		
	Coccus (ENTERO-HQ 1) Coccus (ENTERO-HQ 1) NN Coccus (ENTERO-HQ 1) Coccus (ENTERO-HQ 1) Dohn Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Ceipt to: Nancy.Sonompi Date Shipped: Date Received: Date Verified:	coccus (ENTERO-HQ 1) $4pn 5/17/2018$ 5/ 9/ 2018coccus (ENTERO-HQ 1) $1/.92018$ Soccus (ENTERO-HQ 1) 0.92018 Coccus (ENTERO-HQ 1) 0.92018 John Forbes (403) 291-9897Imail: Nancy Sonompil, B. Sc.2559 29 STREET NECALGARY,AB T1Y 7B5Phone: (403) 291-9897Email: Nancy.Sonompil@alsglobal.comDate Shipped: $200001 BatDate Received:200001 Bat200001 BatDate Verified:$



END OF REPORT



KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received: 17-MAY-18 Report Date: 31-MAY-18 13:58 (MT) Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2096116 Project P.O. #: NOT SUBMITTED Job Reference: WEEK 5 - 2018 SPRING EMS PROGRAM - WW C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

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Environmental 🕽

www.alsglobal.com

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ALS ENVIRONMENTAL ANALYTICAL REPORT

L2096116-1 WWTP EFFLUENT - UV TROUGH Sampled By: CV on 16-MAY-18 @ 14:00 Matrix: WATER Miscellaneous Parameters Ammonia, Total (as N) <0.050 cl p </th <th></th>	
Lossen for 1 WWTP LITEDERT OV TROOGHT Sampled By: CV on 16-MAY-18 @ 14:00 Matrix: WATER Miscellaneous Parameters Ammonia, Total (as N) <0.050	
Matrix:WATERAmmonia, Total (as N)<0.0500.050mg/L27-MAY-18R4057382Biochemical Oxygen Demand2.12.0mg/L17-MAY-18R4052347Orthophosphate-Dissolved (as P)0.1400.010mg/L18-MAY-18R4048029EnterococcusSee Attached11CFU/100mL17-MAY-18R4063307Coliform Bacteria - Fecal<1	
Matrix.WATERMatrix.WATERWATERMiscellaneous Parameters<	
Ammonia, Total (as N) <0.050 mg/L 27-MAY-18 R4057382 Biochemical Oxygen Demand 2.1 2.0 mg/L 17-MAY-18 R4052347 Orthophosphate-Dissolved (as P) 0.140 0.010 mg/L 18-MAY-18 R4063303 Enterococcus See Attached - 1 CFU/100mL 17-MAY-18 R4048192 MPN - E. coli <1	
Biochemical Oxygen Demand 2.1 2.0 mg/L 17-MAY-18 R4052347 Orthophosphate-Dissolved (as P) 0.140 0.010 mg/L 18-MAY-18 R4048029 Enterococcus See Attached 1 CFU/100mL 17-MAY-18 R4063303 Coliform Bacteria - Fecal <1	2
Orthophosphate-Dissolved (as P) 0.140 0.010 mg/L 18-MAY-18 R4048029 Enterococcus See Attached 1 CFU/100mL 17-MAY-18 R4048199 Coliform Bacteria - Fecal <1	.7
Enterococcus See Attached 1 CFU/100mL 17-MAY-18 R4063303 Coliform Bacteria - Fecal <1	9
Coliform Bacteria - Fecal <1 1 CFU/100mL 17-MAY-18 R404819* MPN - E. coli <1	3
MPN - E. coli <1 1 MPN/100mL 17-MAY-18 R4048189 Phosphorus (P)-Total 0.206 0.020 mg/L 24-MAY-18 25-MAY-18 R4056323 Total Suspended Solids <3.0	1
Phosphorus (P)-Total 0.206 0.020 mg/L 24-MAY-18 25-MAY-18 R4056323 Total Suspended Solids <3.0	9
Total Suspended Solids <3.0 3.0 mg/L 23-MAY-18 R4050434	3
	8
NO2. NO3. & (NO2+NO3) in Water	0
Nitrate in Water by IC	
Nitrate (as N) 14.0 0.020 mg/L 18-MAY-18 R4048366	6
Nitrate+Nitrite	
Nitrate and Nitrite (as N) 14.0 0.022 mg/L 22-MAY-18	
Nitrite in Water by IC	
Nitrite (as N) 0.030 0.010 mg/L 18-MAY-18 R4048366	6
L2096116-2 COLUMBIA RIVER UPSTREAM	
Sampled By: CV on 16-MAY-18 @ 15:00	
Matrix: WATER	
Miscellaneous Parameters	
Ammonia, Total (as N) <0.050 0.050 mg/L 27-MAY-18 R4057382	2
Orthophosphate-Dissolved (as P) <0.010 0.010 mg/L 18-MAY-18 R4048029	.9
Enterococcus See Attached 17-MAY-18 R4063303	3
Coliform Bacteria - Fecal 11 1 CFU/100mL 17-MAY-18 R404819	1
MPN - E. coli 5 OCR 1 MPN/100mL 17-MAY-18 R4048189	9
Phosphorus (P)-Total 0.076 0.020 mg/L 24-MAY-18 25-MAY-18 R4056323	.3
Total Suspended Solids 149 3.0 mg/L 23-MAY-18 R4055438	8
NO2, NO3, & (NO2+NO3) in Water	
Nitrate in Water by IC	
Nitrate (as N) 0.134 0.020 mg/L 18-MAY-18 R4048366	6
Nitrate+Nitrite	
Nitrate and Nitrate (as N) 0.154 0.022 mg/L 22-WAT-10	
Nitrite (as N) <0.010 0.010 mg/L 18-MAY-18 R4048366	6
1 2096116-3 COLUMBIA RIVER DOWN STREAM	
Sampled By: CV on 16-MAY-18 @ 15:00	
Matrix: WATER	
Miscellaneous Parameters	
Ammonia. Total (as N) <<0.050 0.050 mg/L 27-MAY-18 R4057382	2
Orthophosphate-Dissolved (as P) <<0.010 0.010 mg/L 18-MAY-18 R4048029	9
Enterococcus See Attached 17-MAY-18 R406330	3
Coliform Bacteria - Fecal 12 1 CFL/100ml 17-MAV-18 P4048104	1
MPN - E, coli 11 OCR 1 MPN/100ml 17-MAV-18 P404819	9
Phosphorus (P)-Total 0 137 0 020 mg/l 24-MAY-18 25-MAY-18 P405632	3
Total Suspended Solids 281 3.0 mg/l 23-MAV-18 P405542	8
NO2. NO3. & (NO2+NO3) in Water	0
Nitrate in Water by IC	
Nitrate (as N) 0.151 0.020 mg/L 18-MAY-18 R4048366	6
Nitrate+Nitrite	
Nitrate and Nitrite (as N) 0.151 0.022 mg/L 22-MAY-18	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2096116-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: CV on 16-MAY-18 @ 15:00							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		18-MAY-18	R4048366
L2096116-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: CV on 16-MAY-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters	0.050		0.050			07 MAY 40	D 4057000
Ammonia, Total (as N)	<0.050		0.050	mg/L		27-MAY-18	R4057382
	<0.010		0.010	mg/L		10-IVIA 1-10	R4048029
Coliform Pactoria Focal	See Attached		4	CELI/100ml		17-IVIA 1-10	R4063303
MPN - E coli	70	OCR	1	MPN/100mL		17-MAV-18	R4040191
Phosphorus (P)-Total	0.047		0 020	ma/l	24-MAY-18	25-MAY-18	R4056323
Total Suspended Solids	68.7		3.020	ma/l		23-MAY-18	R4055438
NO2, NO3, & (NO2+NO3) in Water	00.7		0.0				117000400
Nitrate in Water by IC							
Nitrate (as N)	0.111		0.020	mg/L		18-MAY-18	R4048366
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.111		0.022	mg/L		22-MAY-18	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	ma/l		18-MAY-18	R4048366
	0.010		0.010				

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description		
MS-B	Matrix Spike recovery	could not be accurately calculated due to high	analyte background in sample.
OCR	Parameter is out of cl	lient specific range.	
Test Method R	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is oxygen demand dissolved oxyge BOD (CBOD) is	carried out using proce (BOD) are determined n meter. Dissolved BO determined by adding	dures adapted from APHA Method 5210B - "Bi by diluting and incubating a sample for a speci D (SOLUBLE) is determined by filtering the sar a nitrification inhibitor to the diluted sample pric	ochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a nple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
EC-MPN-CL	Water	MPN - E. coli	APHA 9223B
This analysis is Substrate Colifo sample is mixed The packet is in response are co probability table. Recommended Sample: 1 day Reference: APH	carried out using proce rm Test". E. coli and To with a mixture hydroly: cubated for 18 or 24 hc unted. The final result i Holding Time: A	dures adapted from APHA Method 9223 "Enzy otal Coliform are determined simultaneously. Tl zable substrates and then sealed in a multi-wel ours and then the number of wells exhibiting a p s obtained by comparing the positive response	me he I packet. positive s to a
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is Coliform bacteri involves an initia bacteria (Fecal)	carried out using proce a is enumerated by cult I 24 hour incubation at and is used for non-tur	dures adapted from APHA Method 9222 "Mem turing and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriate bid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". Jume is filtered through a 0.45 micron membrane filter. The test e growth medium. This method is specific for thermotolerant
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is of Chemistry, "Fal.	carried out, on sulfuric low-injection analysis v	acid preserved samples, using procedures mod vith fluorescence detection for the determination	dified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society n of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2+NO3-CAL	C-ED Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by lon C	hromatography with conductivity and/or UV det	tection.
NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by lon C	hromatography with conductivity and/or UV det	tection.
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate dige	carried out using proce estion of the sample.	dures adapted from APHA Method 4500-P "Ph	osphorus". Total Phosphorus is determined colourimetrically after
PO4-DO-COL-E	D Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using proce on a sample that has l	dures adapted from APHA Method 4500-P "Ph been lab or field filtered through a 0.45 micron	osphorus". Dissolved Orthophosphate is determined membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is (TSS) are deterr	carried out using proce nined by filtering a sam	dures adapted from APHA Method 2540 "Solid ple through a glass fibre filter, and by drying th	s". Solids are determined gravimetrically. Total suspended solids e filter at 104 deg. C.
** ALS test metho	ds may incorporate mo	odifications from specified reference methods to	o improve performance.
The last two lett	ers of the above test co	ode(s) indicate the laboratory that performed an	alytical analysis for that test. Refer to the list below:

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

Chain of Custody Numbers:

Reference Information

Test Method References:

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

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



		Workorder:	L209611	6	Report Date: 31-	MAY-18	Pa	ge 1 of 4
Client: K 1 Constant	CICKING HORSE MOU 505 - 17th AVENUE CALGARY AB T2T OF	JNTAIN UTILITY C SW E2	ORPORATIO	NC				
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
		Reference	Result	Quanner			Linin	Analyzeu
BOD-BC-CL	Water							
WG2777847-12 Biochemical Oxy	MB ygen Demand		<2		mg/L			17-MAY-18
EC-MPN-CL	Water							
Batch R44 WG2776545-4 MPN - E. coli	048189 MB		<1		MPN/100mL		1	17-MAY-18
FCC-MF-CL	Water							
Batch R44 WG2776562-1 Coliform Bacteri	048191 MB a - Fecal		<1		CFU/100mL		1	17-MAY-18
NH3-F-CL	Water							
Batch R40 WG2781669-6 Ammonia, Total	057382 LCS (as N)		109.3		%		85-115	27-MAY-18
WG2781669-5 Ammonia, Total	MB (as N)		<0.050		mg/L		0.05	27-MAY-18
NO2-IC-N-ED	Water							
Batch R40	048366							
Nitrite (as N)	203		95.9		%		90-110	18-MAY-18
WG2776347-15 Nitrite (as N)	LCS		100.6		%		90-110	18-MAY-18
WG2776347-17 Nitrite (as N)	LCS		92.2		%		90-110	18-MAY-18
WG2776347-19 Nitrite (as N)	LCS		93.3		%		90-110	19-MAY-18
WG2776347-2 Nitrite (as N)	LCS		94.8		%		90-110	18-MAY-18
WG2776347-1 Nitrite (as N)	МВ		<0.010		mg/L		0.01	18-MAY-18
WG2776347-14 Nitrite (as N)	МВ		<0.010		mg/L		0.01	18-MAY-18
WG2776347-16 Nitrite (as N)	МВ		<0.010		mg/L		0.01	18-MAY-18

WG2776347-18 MB



		Workorder: L2096116		Report Date: 31-MAY-18		Page 2 of 4		
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-ED	Water							
Batch R404	8366							
WG2776347-18 N Nitrite (as N)	ЛВ		<0.010		mg/L		0.01	18-MAY-18
WG2776347-20 N Nitrite (as N)	ЛВ		<0.010		mg/L		0.01	19-MAY-18
NO3-IC-N-ED	Water							
Batch R404	8366							
WG2776347-13 L Nitrate (as N)	.CS		98.6		%		90-110	18-MAY-18
WG2776347-15 L Nitrate (as N)	.CS		99.1		%		90-110	18-MAY-18
WG2776347-17 L Nitrate (as N)	.CS		99.4		%		90-110	18-MAY-18
WG2776347-19 L Nitrate (as N)	.CS		98.2		%		90-110	19-MAY-18
WG2776347-2 L Nitrate (as N)	.CS		96.6		%		90-110	18-MAY-18
WG2776347-1 N Nitrate (as N)	ſВ		<0.020		mg/L		0.02	18-MAY-18
WG2776347-14 Nitrate (as N)	ЛВ		<0.020		mg/L		0.02	18-MAY-18
WG2776347-16 Nitrate (as N)	ЛВ		<0.020		mg/L		0.02	18-MAY-18
WG2776347-18 Nitrate (as N)	ſВ		<0.020		mg/L		0.02	18-MAY-18
WG2776347-20 N Nitrate (as N)	ЛВ		<0.020		mg/L		0.02	19-MAY-18
P-T-COL-ED	Water							
Batch R405	6323							
WG2780139-14 L Phosphorus (P)-Te	. CS otal	KONELAB_1	ГР 103.5		%		80-120	25-MAY-18
WG2780139-13 N Phosphorus (P)-Te	//B otal		<0.020		mg/L		0.02	25-MAY-18
PO4-DO-COL-ED	Water							
Batch R404	8029							
WG2776342-2 L Orthophosphate-D	. CS lissolved (as P)		110.1		%		70-130	18-MAY-18
WG2776342-1 M Orthophosphate-D	IB issolved (as P)		<0.010		mg/L		0.01	18-MAY-18



		Workorder	L209611	6	Report Date: 31	-MAY-18	Pa	ge 3 of 4
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TSS-CL	Water							
Batch R4055438 WG2779025-2 LCS Total Suspended Solid	s		91.1		%		85-115	23-MAY-18
WG2779025-1 MB Total Suspended Solid	S		<3.0		mg/L		3	23-MAY-18

Workorder: L2096116

Report Date: 31-MAY-18

Legend:

Limit DUP	ALS Control Limit (Data Quality Objectives)
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.



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

COC #

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

												_						
Report To			Report Format / Distribution Service Requested (Rush for routine analysis subject to availabilit					ility)										
Company: Kicking Horse Mountain Resort Utility Corporation		🗹 Standard	Other			Regular (Standard Turnaround Times - Business Days)												
Contact: Travis Jobin			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									
	<u> </u>	Email 2:	pmajer@skircr.	<u>com</u>		O Same Day or Weekend Emergency - Contact ALS to Confirm TAT												
Phone:	250-344-8442 Fax:	Email 3:	mskyring@kick	inghorseresort.c	om	Analysis Request												
Invoice To	Same as Report ? 🔲 Yes 🔃 No	Client / Project Information				Please indicate below Filtered, Preserved or both (F, P, F/P)												
Hardcopy of	Invoice with Report? 🔲 Yes 🗹 No	Job #:	Week 5 - 2018	Spring EMS pro	ogram - WW													
Company:	Resorts of the Canadian Rockies	PO/AFE:		_		[- 1		
Contact:	Patrick Majer	LSD:														1		
Address:	1505 - 17th Ave SW Calgary AB																	lers
Phone:	Fax:	Quote #:											1					ıtair
Lab V	Work Order # b use only)	ALS Contact:	LS	Sampler:			-						oliform	occi				ır of Cor
Sample)	Sample Identification (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD5	TSS	N-NH4	N-NO3	N-N02	Total P	Ortha P	Fecal C	Enteroc	E. Colí			Numbe
	WWTP Effluent - UV trough Temp:		MAYIG	7.01	Water	X	Х	X	X	X	X	X	X	X	X			5
	Columbia River Upstream Temp: 10 pH: 7,8		1	314	Water		X	Х	Х	Х	X	X	X	X	X			4
	Columbia River Down stream Temp: 16 pH: 7.8			1	Water		X	Х	X	Х	X	X	X	Х	Х			4
	Columbia River Side Channel Temp: 3 pH: 7.9		J	4	Water		Х	Х	Х	X	X	X	Х	Х	X			4
													_					
	Special Instructions / Regulations with water or land	d use (CCN	E-Freshwater	Aquatic Life/BC	CSR - Commerci	al/AB	Tier 1	1 - Na	tural	, etc)	/ Haz	ardo	us De	tails				
					· · · · · · · · · · · · · · · · · · ·											-		
	Failure to complete all	portions o	f this form may	delay analysis.	Please fill in this	s form	LEG	BLY										
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.																		
SHIPMENT RELEASE (client use) 2000 100 100 100 100 100 100 100 100 10																		
Released by	/: Date (dd-mmm-yy) Time (hh-mm) Received		Date:	Time: 1)7	Temperature:	Veri	fied by	y:		Date););		Time):		Obse Yes /	rvatio No ?	ins:
			$ \Delta /$	16877	Õ ℃											If Yes	add	SIF
					-					•					GENE	20 00	Front	



Microbial Test Results

Samples collected May 16, 2018

Final Report

May 31, 2018

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

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



SAMPLE INFORMATION

Samula ID/		Dessint			
Internal ID	Collected	Collected Received Enterococcus test initiation			
L2096116-1 WWTP EFFLUENT – UV TROUGH/	16-May-18 at 1400h	17-May-18 at 1155h	17-May-18 at 1245h	7.7°C	
1718-1122-01					
L2096116-2 COLUMBIA RIVER UPSTREAM/	16-May-18 at 1500h	17-May-18 at 1155h	17-May-18 at 1245h	7.8°C	
1718-1122-02					
L2096116-3 COLUMBIA RIVER DOWN STREAM/	16-May-18 at 1500h	17-May-18 at 1155h	17-May-18 at 1245h	8.1°C	
1718-1122-03					
L2096116-4 COLUMBIA RIVER SIDE CHANNEL/	16-May-18 at 1500h	17-May-18 at 1155h	17-May-18 at 1245h	8.4°C	
1718-1122-04					

TEST TYPES

• *Enterococcus* enumeration test

RESULTS

Microbial test results

Comula ID	MPN/100 mL				
	Enterococcus				
L2096116-1 WWTP EFFLUENT – UV TROUGH	<1				
L2096116-2 COLUMBIA RIVER UPSTREAM	4.1				
L2096116-3 COLUMBIA RIVER DOWN STREAM	2.0				
L2096116-4 COLUMBIA RIVER SIDE CHANNEL	10.9				
MPN = Most Probable Number					



QA/QC

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

istil

Report By: Courtney Bogstie, BSc Biologist

Destalaret

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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



APPENDIX A – Test data
G NAUTILUS ENVIRONMENTAL			0	luant	ti-Tray	Benc	h She	et -	Enter
					Client	ALSIO	Re	ference	718-112
Techician:		Reagent	eagent usec Lot#/Expin	t: Enteroler	28/18 M	s	ample Infor Dilutio Cor	n Factor:	1
Thermometer Serial #: 160903475		Quan	ti Tray 2000	Lot#/Expin	Y: (INDY	1/07110	012.020		
Incubator Temperature: 40° (must be $41 \pm 0.5^{\circ}$ C)	11								
Results - 24 Hour Incubation Date: 1018/05/18 Time	: 130x	0		Technicia	n CR				
Incubator Temp: U(must be 41 ± 0.5°C)	CT	1718-1172	in sul	21-811-22	Enterococci ()	Fluorescent)			
# Positive Large Wells:	0	0	r	24	q		_		_
# Ambiguous Large Wells:	0	0	0.	0	0				
# Positive Small Wells (Tray 2000 only):	0	0	0	0	1				
# Ambiguous Small Wells (Tray 2000 only):	0	0	0	0	0				
Most Probable Number at 24 hours:	5	1	4.1	2.0	10.9		_		_
Date:Time	10		1	Technicia	n				
Incubator Temp: (must be 41 ± 0.5°C)	ð				Enterococci (F	-luorescent)			
# Confirmed Positive Large Wells:									
# Confirmed Positive Small Wells (Tray 2000 only):									
								-	

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

Nautilus Environmental (Calgary)



APPENDIX B – Chain-of-custody form



CALGARY

Subcontract	Request	Form
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Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

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

NOTES: Please reference on final report and invoice: PO# <u>L2096116</u> ALS requires QC data to be provided with your final results.

Please see enclosed <u>4</u> sample(s) in <u>4</u> Container(s)

SAMPLE NUMBER ANALYTI	ICAL REQUIRED	DATE SAMPLED DUE DATE	Priority Flag
L2096116-1 WWTP EFFLUENT - UV TROUGH	ссия (ENTERO-HO 1) - 0/	5/ 16/ 2018 2-pm	770
L2096116-2 COLUMBIA RIVER UPSTREAM	ссия (ENTERO-HQ 1) - 02	5/ 16/ 2018 3pm 5/25/2018	7.8°
L2096116-3 COLUMBIA RIVER DOWN STREAM	и ссиз (ENTERO-HQ 1) - 03	5/ 16/ 2018 3pr 5/25/2018	8.10
L2096116-4 COLUMBIA RIVER SIDE CHANNEL	ссия (ENTERO-HQ 1) - 04	1 5/16/2018 3pr 5/25/2018	8.42
Subcontract Info Contact: Analysis and reporting info contact:	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5	1718-112	2
Please email confirmation of rece	ipt to: Nancy.Sonomp	Email: Nancy.Sonompil@als	global.com
Shipped By: Jazoo	Date Shipped:	4x 200mL Bo	ttles
Received By: DU	Date Received:	2018/05/17	11:55
Verified By: NOSIT	Date Verified:		
Sample Integrity Issues:	Temperature:		



END OF REPORT



KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received: 22-JUN-18 Report Date: 14-JUL-18 14:50 (MT) Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2117308 Project P.O. #: NOT SUBMITTED Job Reference: RCR - KHMR C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

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

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

Environmental 🕽

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2117308-1 UV TROUGH Sampled By: TJ/CV on 21-JUN-18 @ 11:30 Matrix: water Miscellaneous Parameters Biochemical Oxygen Demand Orthophosphate-Dissolved (as P) Coliform Bacteria - Fecal Phosphorus (P)-Total Total Suspended Solids	3.9 <0.0050 <1 0.074 3.3		2.0 0.0050 1 0.020 3.0	mg/L mg/L CFU/100mL mg/L mg/l	12-JUL-18	22-JUN-18 22-JUN-18 22-JUN-18 12-JUL-18 27-JUN-18	R4098889 R4096656 R4095815 R4123833 R4098294
	3.3		3.0	mg/L		27-JUIN-18	K4U98294

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

Reference Information

L2117308 CONTD.... PAGE 3 of 3

Version: FINAL

Test Method References: ALS Test Code Matrix Method Reference** **Test Description** 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 Fecal Coliform Count-MF Water This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level. 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 Diss. Orthophosphate in Water by Colour **APHA 4500-P PHOSPHORUS** Water 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. **Total Suspended Solids** TSS-CL Water APHA 2540 D-Gravimetric This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C. ** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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

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

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.



	N	Workorder:	L2117308	3	- Report Date: 14-	JUL-18	Pag	e 1 of 2
Client: KICKING H 1505 - 17th CALGARY	ORSE MOUNTA AVENUE SW AB T2T 0E2	IN UTILITY CO	RPORATIO	N			Ū	
Contact: TRAVIS JC	DRIN							
Test	Matrix I	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	Water							
Batch R4098889 WG2808951-2 LCS Biochemical Oxygen Dem	and		99.5		%		85-115	22-JUN-18
WG2808951-1 MB Biochemical Oxygen Dem	and		<2.0		mg/L		2	22-JUN-18
FCC-MF-CL	Water							
Batch R4095815 WG2805418-3 MB Coliform Bacteria - Fecal			<1		CFU/100mL		1	22-JUN-18
P-T-COL-ED	Water							
Batch R4123833								
WG2820628-2 LCS Phosphorus (P)-Total		KONELAB_TP	94.0		%		80-120	12-JUL-18
WG2820628-1 MB Phosphorus (P)-Total			<0.020		mg/L		0.02	12-JUL-18
PO4-DO-COL-CL	Water							
Batch R4096656								
Orthophosphate-Dissolved	d (as P)		100.8		%		80-120	22-JUN-18
WG2804601-17 MB Orthophosphate-Dissolved	d (as P)		<0.0050		mg/L		0.005	22-JUN-18
TSS-CL	Water							
Batch R4098294 WG2808199-2 LCS			07.8		94		95 445	27 11 10 40
WG2808199-1 MB			57.0		70		611-60	21-JUIN-10
Total Suspended Solids			<3.0		mg/L		3	27-JUN-18

Workorder: L2117308

Report Date: 14-JUL-18

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
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.

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



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Report To		<u>,</u>		Report Fo	rmat / Distributi	on		Serv	ice Re	ques	ā				_			
Company:	Kicking Horse Mounta	ain Water Utility	Co. Ltd.	Standard	Other			🖲 Re	gular (S	tandan	d Turn	around	l Times	- Busines	s Days)			
Contact:	Travis Jobin			DF	Excel	Digital	🗹 Fax	O Pri	ority (2-	4 Busii	ness Da	ays) - !	50% Su	rcharge -	Contact A	ALS to Co	ofirm TAT	
Address:	1500 Kicking Horse T	rail		Email 1:	tjobin@kickingh	kickinghorseresort.com O Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm						Confirm TAT						
				Email 2:	pmajer@skircr.c	:om	· · · · · · · · · · · · · · · · · · ·	O Same Day or Weekend Emergency - Contact ALS to Confirm TAT										
Phone:	250-344-6003	Fax:		Email 3:	mskyring@kicki	nghorseresort.c	om					A	nalys	is Requ	lest			
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Contact:	Patrick Majer			LSD:			·····					Ê	1					
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	Also provided on	another Exce	I tab are the A	LS location addresses	s, phone numbe	rs and sample	container / prese	rvatio	n/ho	Iding	y time	e tabl	e for	commo	n analı	/ses.		
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KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1500 Kicking Horse Trail CALGARY AB T2T 0E2 Date Received: 03-AUG-18 Report Date: 17-AUG-18 13:01 (MT) Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2140985 Project P.O. #: NOT SUBMITTED Job Reference: DW-RCR/KHMR C of C Numbers: Legal Site Desc:

Nancy Sonompil, B. Sc. Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled Bv: CV on 02-AUG-18 @ 15:30							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		03-AUG-18	R4161450
Orthophosphate-Dissolved (as P)	0.0812	RRV	0.0050	mg/L		04-AUG-18	R4159612
Note: Sample refiltered and reran, data							
confirmed. Coliform Bacteria - Fecal	-1		1	CEU/100ml		03-4116-18	R/150083
Phosphorus (P)-Total	0.0560		0.0050	ma/l		13-AUG-18	R4168532
Total Suspended Solids	<3.0		3.0	ma/l		08-AUG-18	R4162099
NO2, NO3 and Sum of NO2/NO3	40.0		0.0				102000
Nitrate in Water by IC							
Nitrate (as N)	15.6		0.020	mg/L		03-AUG-18	R4162609
Nitrate+Nitrite			•			40.000	
Nitrate and Nitrite (as N)	15.6		0.050	mg/L		10-AUG-18	
Nitrite in Water by IC Nitrite (as N)	0.036		0.010	ma/L		03-AUG-18	R4162609
				3			

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description		
SPL	Sample was I	Preserved at the laboratory	
Sample Param	eter Qualifier Key:		
Qualifier	Description		
MS-B	Matrix Spike recovery	/ could not be accurately calculated due to high	n analyte background in sample.
RRV	Reported Result Veri	fied By Repeat Analysis	
Test Method R	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is oxygen demand dissolved oxyge BOD (CBOD) is	carried out using proce (BOD) are determined n meter. Dissolved BO determined by adding	dures adapted from APHA Method 5210B - "Bi by diluting and incubating a sample for a spec D (SOLUBLE) is determined by filtering the sar a nitrification inhibitor to the diluted sample prio	ochemical Oxygen Demand (BOD)". All forms of biochemical ified time period, and measuring the oxygen depletion using a nple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is Coliform bacteria involves an initia bacteria (Fecal)	carried out using proce a is enumerated by cul I 24 hour incubation at and is used for non-tur	dures adapted from APHA Method 9222 "Mem turing and colony counting. A known sample vo 44.5 degrees C of the filter with the appropriat bid water with a low background bacteria level.	brane Filter Technique for Members of the Coliform Group". Solume is filtered through a 0.45 micron membrane filter. The test e growth medium. This method is specific for thermotolerant
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with conductivity and/or UV de	tection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with conductivity and/or UV de	tection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate dige	carried out using proce stion of the sample.	dures adapted from APHA Method 4500-P "Ph	osphorus". Total Phosphorus is determined colourimetrically after
PO4-DO-COL-C	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrically	carried out using proce on a sample that has l	dures adapted from APHA Method 4500-P "Ph been lab or field filtered through a 0.45 micron	osphorus". Dissolved Orthophosphate is determined membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is ((TSS) are deterr	carried out using proce nined by filtering a sam	dures adapted from APHA Method 2540 "Solic nple through a glass fibre filter, and by drying th	ls". Solids are determined gravimetrically. Total suspended solids ne filter at 104 deg. C.
** ALS test metho	ds may incorporate mo	odifications from specified reference methods t	o improve performance.
The last two lette	ers of the above test co	ode(s) indicate the laboratory that performed ar	nalytical analysis for that test. Refer to the list below:
Laboratory Defi	nition Code Labo	ratory Location	

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ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



Workorder: L2140985 Report Date: 17-AUG-18 Page 1 of 3 KICKING HORSE MOUNTAIN UTILITY CORPORATION Client: 1500 Kicking Horse Trail CALGARY AB T2T 0E2 TRAVIS JOBIN Contact: Test RPD Matrix Reference Result Qualifier Units Limit Analyzed BOD-BC-CL Water Batch R4161450 WG2844358-3 DUP L2140985-1 **Biochemical Oxygen Demand** <2.0 <2.0 **RPD-NA** mg/L N/A 20 03-AUG-18 WG2844358-2 LCS **Biochemical Oxygen Demand** 103.4 % 85-115 03-AUG-18 WG2844358-1 MB **Biochemical Oxygen Demand** <2.0 mg/L 2 03-AUG-18 FCC-MF-CL Water Batch R4159983 WG2842447-2 DUP L2140985-1 Coliform Bacteria - Fecal <1 <1 **RPD-NA** CFU/100mL N/A 65 03-AUG-18 WG2842447-1 MB Coliform Bacteria - Fecal CFU/100mL <1 1 03-AUG-18 Water NO2-IC-N-CL Batch R4162609 WG2845781-10 LCS Nitrite (as N) 107.3 % 90-110 03-AUG-18 WG2845781-9 MB Nitrite (as N) <0.010 mg/L 0.01 03-AUG-18 Water NO3-IC-N-CL Batch R4162609 WG2845781-10 LCS Nitrate (as N) 97.8 % 90-110 03-AUG-18 WG2845781-9 MB Nitrate (as N) < 0.020 mg/L 0.02 03-AUG-18 P-T-COL-CL Water Batch R4168532 WG2848020-11 DUP L2140985-1 Phosphorus (P)-Total 0.0560 0.0540 mg/L 3.5 20 13-AUG-18 WG2848020-10 LCS Phosphorus (P)-Total 99.6 % 80-120 13-AUG-18 WG2848020-9 MB Phosphorus (P)-Total < 0.0050 mg/L 0.005 13-AUG-18 WG2848020-12 MS L2140985-1 Phosphorus (P)-Total N/A MS-B % 13-AUG-18

PO4-DO-COL-CL

Water



		Workorder	: L214098	5	Report Date: 17	7-AUG-18	Pa	ige 2 of 3
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PO4-DO-COL-CL	Water							
Batch R4159 WG2841812-2 LC Orthophosphate-Dis	612 CS ssolved (as P)		103.4		%		80-120	04-AUG-18
WG2841812-1 M Orthophosphate-Dis	B ssolved (as P)		<0.0050		mg/L		0.005	04-AUG-18
TSS-CL	Water							
Batch R4162 WG2844349-5 LC Total Suspended So	099 CS olids		97.6		%		85-115	08-AUG-18
WG2844349-4 MI Total Suspended So	B olids		<3.0		mg/L		3	08-AUG-18

Workorder: L2140985

Report Date: 17-AUG-18

Legend:

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

Sample Parameter Qualifier Definitions:

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

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

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Report To	Report Fo	ormat / Distributi	on		Service Requested (Rush for routine analysis subject to availability)										
Company: Kicking Horse Mountain Water Utility Co. Ltd.	Standard	Other			• Ree	gular (S	tandard	i Tum	around	Times -	Business	Days)			_
Contact: Travis Jobin	DPDF	Excel	 Digital	🗸 Fax	O Prix	ority (2-	4 Busin	ess Da	3ys) - 5	0% Sur	charge - C	ontact ALS	to Confirm	TAT	
Address: 1500 Kicking Horse Trail	Email 1:	tjobin@kickingh	orseresort.com	1	O Em	iergency	(1-2 B	lus. Da	iys) - 1	00% Su	rcharge -	Contact AL	S to Confirm	TAT	
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Contact: Patrick Majer	LSD:				1 I										
Address: 1505 - 17th Ave SW Calgary AB															ners
Phone: Fax:	Quote #:	Q33059							ð	9					ntai
Lab Work Order # (lab use only)	ALS Contact:	LS	Sampler:	XCV			oliform	Ń	AL	ER0					of Co
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KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received:30-AUG-18Report Date:24-SEP-18 16:34 (MT)Version:FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2156256 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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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2156256-1 UV TROUGH Sampled By: CLIENT on 29-AUG-18 @ 14:30 Matrix: water Miscellaneous Parameters Biochemical Oxygen Demand Orthophosphate-Dissolved (as P) Coliform Bacteria - Fecal Bhospharus (D) Total	<2.0 1.77 <1		2.0 0.0050 1	mg/L mg/L CFU/100mL		01-SEP-18 30-AUG-18 30-AUG-18 24 SEB 18	R4204241 R4196246 R4195610
Phosphorus (P)-rotal	1.76		0.50	mg/L		24-SEP-10	R4236892
			5.0				

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

Reference Information

L2156256 CONTD.... PAGE 3 of 3 Version: FINAL

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**						
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode						
This analysis is carried out oxygen demand (BOD) are dissolved oxygen meter. Di BOD (CBOD) is determined	using proced determined ssolved BOE by adding a	dures adapted from APHA Method 5210B - "Bioch by diluting and incubating a sample for a specifie 0 (SOLUBLE) is determined by filtering the sampl a nitrification inhibitor to the diluted sample prior to	nemical Oxygen Demand (BOD)". All forms of biochemical d time period, and measuring the oxygen depletion using a e through a glass fibre filter prior to dilution. Carbonaceous o incubation.						
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 persulphate digestion of the	using proced e sample.	dures adapted from APHA Method 4500-P "Phos	phorus". Total Phosphorus is determined colourimetrically after						
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS						
This analysis is carried out colourimetrically on a samp	using proced le that has b	dures adapted from APHA Method 4500-P "Phosp een lab or field filtered through a 0.45 micron me	phorus". Dissolved Orthophosphate is determined mbrane filter.						
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric						
This analysis is carried out 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 inc	orporate mo	difications from specified reference methods to in	nprove performance.						

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

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

Chain of Custody Numbers:

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: L2156256 Report Date: 24-SEP-18 Page 1 of 2 KICKING HORSE MOUNTAIN UTILITY CORPORATION Client: 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 TRAVIS JOBIN Contact: Test Qualifier RPD Limit Matrix Reference Result Units Analyzed BOD-BC-CL Water Batch R4204241 WG2869912-2 LCS **Biochemical Oxygen Demand** 109.5 % 85-115 01-SEP-18 WG2869912-1 MB **Biochemical Oxygen Demand** <2.0 mg/L 2 01-SEP-18 FCC-MF-CL Water Batch R4195610 WG2865579-1 MB <1 CFU/100mL Coliform Bacteria - Fecal 1 30-AUG-18 P-T-COL-CL Water Batch R4236892 WG2884824-58 LCS Phosphorus (P)-Total 96.0 % 80-120 24-SEP-18 WG2884824-57 MB Phosphorus (P)-Total < 0.0050 mg/L 0.005 24-SEP-18 PO4-DO-COL-CL Water R4196246 Batch WG2864743-18 LCS Orthophosphate-Dissolved (as P) 91.5 % 80-120 30-AUG-18 WG2864743-17 MB Orthophosphate-Dissolved (as P) < 0.0050 mg/L 0.005 30-AUG-18 TSS-CL Water R4203977 Batch WG2868841-5 LCS 103.6 **Total Suspended Solids** % 85-115 05-SEP-18 WG2868841-4 MB **Total Suspended Solids** <3.0 mg/L 3 05-SEP-18

Workorder: L2156256

Report Date: 24-SEP-18

Legend:

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

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 Canada Toll Free: 1 800 668 9878 <u>Www.alsglobal.com</u>



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Report To		Report Format / Distribution Service Reque																
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	Standard Other Regular (Standard Turnaround Times - Business Days)																
Contact:	Travis Jobin		Excel	Digital	✓ Fax	O Pr	iority (2	-4 Bus	iness D)ays) -	50% St	urcharg	je - Con	tact ALS	S to Co	nfirm T	TAT	
Address:	1500 Kicking Horse Trail	Email 1:	Email 1: tjobin@kickinghorseresort.com 🛛 Emergency (1-2 Bus. Days) - 100% Surcharge - Contact				ntact AL	S to C	onfirm	TAT								
		Email 2:	pmajer@skircr.e	<u>com</u>		Ö Sa	ime Day	/ or We	eekend	Emerg	jency •	Contact	t ALS to	Confirm	n TAT			
Phone:	250-344-6003 Fax:	Email 3:	mskyring@kicki	inghorseresort.co	<u>om</u>						Analys	sis Re	ques	t				
Invoice To	Same as Report ? Yes 🗸 No	Client / Pr	oject Informatio	on		Ple	ease ir	ndicat	te bel	ow Fi	Itered	, Pres	served	or bo	th (F,	P, F/	P)	
Hardcopy of	Invoice with Report? Yes I No	Job #:	RCR - Kicking H	Iorse Mountain F	Resort										Ī			
Company:	Resorts of the Canadian Rockies	PQ / AFE:																
Contact:	Patrick Majer	LSD:																
Address:	1505 - 17th Ave SW Calgary AB														ļ			ers
Phone:	Fax:	Quote #:	Q33059												1			ıtain
Lab	Work Order # ib use only)	ALS Contact:	LS	Sampler:				oliform	hosphate									er of Cor
Sample 3	Sample Identification (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type		TSS	Fecal C	Ortho P	Total P					_			Numbe
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KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received:05-OCT-18Report Date:17-OCT-18 17:55 (MT)Version:FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2176527 Project P.O. #: NOT SUBMITTED Job Reference: WEEK 1 - 2018 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.]

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
2176527-1 WWTP EFFLUENT - UV TROUGH							
Sampled By: TJ/MS on 04-OCT-18 @ 12:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.118		0.050	mg/L		15-OCT-18	R4278727
Biochemical Oxygen Demand	<2.0		2.0	mg/L		05-OCT-18	R4268828
Orthophosphate-Dissolved (as P)	0.308	RRV	0.0050	mg/L		05-OCT-18	R4270707
Enterococcus	See Attached					05-OCT-18	R4283753
Coliform Bacteria - Fecal	<1		1	CFU/100mL		05-OCT-18	R4263437
MPN - E. coli	<1		1	MPN/100mL		05-OCT-18	R4263427
Phosphorus (P)-Total	0.0106	RRV	0.0050	mg/L		12-OCT-18	R4276005
Total Suspended Solids	8.7		3.0	mg/L		11-OCT-18	R4274973
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	16.4		0.020	mg/L		05-OCT-18	R4274215
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	16.5		0.050	mg/L		12-OCT-18	
Nitrite in Water by IC							
Nitrite (as N)	0.051		0.010	mg/L		05-OCT-18	R4274215
L2176527-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/MS on 04-OCT-18 @ 13:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		15-OCT-18	R4278727
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		05-OCT-18	R4270707
Enterococcus	See Attached			0=11/100		05-OCT-18	R4283753
Coliform Bacteria - Fecal	8		1	CFU/100mL		05-OCT-18	R4263437
MPN - E. coli	2	OCR	1	MPN/100mL		05-OCT-18	R4263427
Phosphorus (P)-Total	0.588		0.0050	mg/L		12-OCT-18	R4276005
Total Suspended Solids	6.0		3.0	mg/L		11-OCT-18	R4274973
NO2, NO3 and Sum of NO2/NO3							
Nitrate in water by IC Nitrate (as N)	0.088		0 020	ma/l		05-OCT-18	R4274215
	0.000		0.020	iiig/L		03-001-10	114274215
Nitrate and Nitrite (as N)	0.088		0.050	mg/L		12-OCT-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		05-OCT-18	R4274215
L2176527-3 COLUMBIA RIVER DOWNSTREAM							
Sampled By: TJ/MS on 04-OCT-18 @ 13:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		15-OCT-18	R4278727
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		05-OCT-18	R4270707
Enterococcus	See Attached					05-OCT-18	R4283753
Coliform Bacteria - Fecal	2		1	CFU/100mL		05-OCT-18	R4263437
MPN - E. coli	<1		1	MPN/100mL		05-OCT-18	R4263427
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		15-OCT-18	R4279056
Total Suspended Solids	5.3		3.0	mg/L		11-OCT-18	R4274973
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	0.095		0.020	mg/L		05-OCT-18	R4274215
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.095		0.050	mg/L		12-OCT-18	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

L2176527-3 COLUMBIA RIVER DOWNSTREAM						
Sampled By: TJ/MS on 04-OCT-18 @ 13:00 Matrix: WATER Nitrite in Water by IC						
Nitrite (as N)	<0.010		0.010	mg/L	05-OCT-18	R4274215
L2176527-4 COLUMBIA RIVER SIDE CHANNEL						
Sampled By: TJ/MS on 04-OCT-18 @ 13:00						
Matrix: WATER						
Ammonia Total (as N)	<0.050		0.050	ma/l	15-OCT-18	R4278727
Orthophosphate-Dissolved (as P)	0.0082		0.0050	ma/L	05-OCT-18	R4270707
Enterococcus	See Attached		0.0000		05-OCT-18	R4283753
Coliform Bacteria - Fecal	6		1	CFU/100mL	05-OCT-18	R4263437
MPN - E. coli	5	OCR	1	MPN/100mL	05-OCT-18	R4263427
Phosphorus (P)-Total	0.0155		0.0050	mg/L	15-OCT-18	R4279056
Total Suspended Solids	6.0		3.0	mg/L	11-OCT-18	R4274973
NO2, NO3 and Sum of NO2/NO3						
Nitrate in Water by IC	0.076		0 020	ma/l	05-OCT-18	P/27/215
Nitrate+Nitrite	0.070		0.020	iiig/L	05-001-10	114274215
Nitrate and Nitrite (as N)	0.076		0.050	mg/L	12-OCT-18	
Nitrite in Water by IC						
Nitrite (as N)	<0.010		0.010	mg/L	05-OCT-18	R4274215

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

Reference Information

Sample Parameter Qualifier Key: Qualifier Description OCR Parameter is out of client specific range. RRV Reported Result Verified By Repeat Analysis **Test Method References:** ALS Test Code Matrix Method Reference** **Test Description** BOD-BC-CL Water **Biochemical Oxygen Demand (BOD)** APHA 5210 B-5 day Incub.-O2 electrode This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation. EC-MPN-CL Water MPN - E. coli APHA 9223B This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table. Recommended Holding Time: Sample: 1 day Reference: APHA FCC-MF-CL Fecal Coliform Count-MF APHA 9222D Water This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level. N2N3-CALC-CL Water Nitrate+Nitrite CALCULATION NH3-F-CL Water Ammonia by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC This analysis is carried out, 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-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** Water This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. TSS-CL Water **Total Suspended Solids** APHA 2540 D-Gravimetric This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C. ** ALS test methods may incorporate modifications from specified reference methods to improve performance. The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



Client:

Contact:

Quality Control Report

Workorder: L2176527Report Date: 17-OCT-18Page 1 of 3KICKING HORSE MOUNTAIN UTILITY CORPORATION
1505 - 17th AVENUE SW
CALGARY AB T2T 0E2
TRAVIS JOBINCALGARY AB T2T 0E2
TRAVIS JOBIN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	Water							
Batch R4268828	1							
WG2899740-9 DUP Biochemical Oxygen De	emand	L2176527-1 <2.0	<2.0	RPD-NA	mg/L	N/A	20	05-OCT-18
WG2899740-7 MB Biochemical Oxygen De	emand		<2.0		mg/L		2	05-OCT-18
EC-MPN-CL	Water							
Batch R4263427								
WG2897414-1 MB MPN - E. coli			<1		MPN/100mL		1	05-OCT-18
FCC-MF-CL	Water							
Batch R4263437	,							
WG2897429-1 MB Coliform Bacteria - Fec	al		<1		CFU/100mL		1	05-OCT-18
NH3-F-CL	Water							
Batch R4278727	,							
WG2904016-10 LCS Ammonia, Total (as N)			99.4		%		85-115	15-OCT-18
WG2904016-9 MB Ammonia, Total (as N)			<0.050		mg/L		0.05	15-OCT-18
NO2-IC-N-CL	Water							
Batch R4274215								
WG2901731-11 DUP Nitrite (as N)		L2176527-4 <0.010	<0.010	RPD-NA	mg/L	N/A	20	05-OCT-18
WG2901731-10 LCS Nitrite (as N)			107.3		%		90-110	05-OCT-18
WG2901731-9 MB Nitrite (as N)			<0.010		mg/L		0.01	05-OCT-18
WG2901731-12 MS Nitrite (as N)		L2176527-4	118.7		%		75-125	05-OCT-18
NO3-IC-N-CL	Water							
Batch R4274215								
WG2901731-11 DUP Nitrate (as N)		L2176527-4 0.076	0.076		mg/L	0.8	20	05-OCT-18
WG2901731-10 LCS Nitrate (as N)			102.2		%		90-110	05-OCT-18
WG2901731-9 MB								



		Workorder:	L217652	7	Report Date: 17-	OCT-18	Pa	ge 2 of 3
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-CL	Water							
Batch R4274215 WG2901731-9 MB Nitrate (as N)			<0.020		mg/L		0.02	05-OCT-18
WG2901731-12 MS Nitrate (as N)		L2176527-4	115.9		%		75-125	05-OCT-18
P-T-COL-CL	Water							
Batch R4276005								
WG2902141-2 LCS Phosphorus (P)-Total			95.0		%		80-120	12-OCT-18
WG2902141-1 MB Phosphorus (P)-Total			<0.0050		mg/L		0.005	12-OCT-18
Batch R4279056 WG2904145-2 LCS Phosphorus (P)-Total			105.9		%		80-120	15-OCT-18
WG2904145-1 MB Phosphorus (P)-Total			<0.0050		mg/L		0.005	15-OCT-18
PO4-DO-COL-CL	Water							
Batch R4270707								
WG2897470-2 LCS Orthophosphate-Dissolv	ved (as P)		100.9		%		80-120	05-OCT-18
WG2897470-1 MB Orthophosphate-Dissolv	ved (as P)		<0.0050		mg/L		0.005	05-OCT-18
TSS-CL	Water							
Batch R4274973 WG2901138-2 LCS Total Suspended Solids			92.9		%		85-115	11-OCT-18
WG2901138-1 MB Total Suspended Solids			<3.0		mg/L		3	11-OCT-18

Workorder: L2176527

Report Date: 17-OCT-18

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
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.

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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.



Microbial Test Results

Samples collected October 4, 2018

Final Report

October 17, 2018

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

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



SAMPLE INFORMATION

Samula ID (Dessint			
Internal ID	Collected	Received	Enterococcus test initiation	temperature	
L2176527-1 WWTP EFFLUENT – UV TROUGH/	04-Oct-18 at 1200b	05-Oct-18 at 1345h	05-Oct-18 at 1415h	n/a	
1819-0228-01	120011	13 1311	112311		
L2176527-2 COLUMBIA	04.0 + 10 +	05 0 1 10 1	05 0 1 10 1		
RIVER UPSTREAM/	04-Oct-18 at 1200h	05-Oct-18 at 1345h	05-Oct-18 at 1415h	n/a	
1819-0228-02	120011	13 1311	111511		
L2176527-3 COLUMBIA	04 0 -+ 10 -+	05 0 -+ 10 -+	05 0 -+ 10 -+		
RIVER DOWNSTREAM/	04-Oct-18 at 1200h	05-Oct-18 at 1345h	05-Oct-18 at 1415h	n/a	
1819-0228-03	120011	13 1311	112311		
L2176527-4 COLUMBIA	04 Oct 19 at	05 Oct 19 ot	05 Oct 19 at		
RIVER SIDE CHANNEL/	1200h	1345h	1415h	n/a	
1819-0228-04					

TEST TYPES

• *Enterococcus* enumeration test

RESULTS

Microbial test results

Samala ID	MPN/100 mL		
	Enterococcus		
L2176527-1 WWTP EFFLUENT – UV TROUGH	3.1		
L2176527-2 COLUMBIA RIVER UPSTREAM	<1		
L2176527-3 COLUMBIA RIVER DOWNSTREAM	1.0		
L2176527-4 COLUMBIA RIVER SIDE CHANNEL	5.2		

MPN = Most Probable Number

QA/QC

QA/QC summary	Enterococcus
Protocol deviations	Sample received and set outside of hold-time
Control performance	Acceptable
Test performance	Valid



to

Courtney Bogstie, BSc

Destatard

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

Report By:

Biologist

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
Test Initiation Date: 2018/10/05 Time: 74.7 1415	
Test Initiation Date: 2018/10/05 R Time: #47 1415 R	Client <u>ALSION</u> Reference 1819-0228
Techician: +2	Reagent used: Enterolert [™] Sample Information Reagent Lot#/Expiry: <u>FPしIO 04/Aug/201</u> Comments:
Thermometer Serial #: <u>」しつつっつイチS</u> Incubator #: 子 Incubator Temperature: <u>니 (</u> must be 41 ± 0.5°C)	Quanti Tray 2000 Lot#/Expiry: MNO/4 12/12/2020
Results - 24 Hour Incubation Date: 2081000 Time: 140	Technician:
Incubator Temp: (must be 41 ± 0.5°C) CTI	61 62 62 AN
# Positive Large Wells:	
# Ambiguous Large Wells:	
# Positive Small Wells (Tray 2000 only): # Ambiguous Small Wells (Tray 2000 only):	
Most Probable Number at 24 hours:	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Results - 28 Hour Incubation	1.0
Date: Time:	Technician: M
Incubator Temp: (must be 41 ± 0.5°C) CTL	Enterococci (Fluorescent)
# Confirmed Positive Large Wells:	
# Confirmed Positive Small Wells (Tray 2000 only):	
Most Probable Number at 28 hours:	

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

Nautilus Environmental (Calgary)

File: ENT F106



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

 NOTES:
 Please reference on final report and invoice: PO#
 L2176527

 ALS requires QC data to be provided with your final results.
 L2176527

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

SAMPLE NUMBER					DATE SAMP	LED	Philade
A	NALYTIC	CAL REQUIE	RED	1819-0228	DL	E DATE	Flag
L2176527-1 WWTP EFFLUEN	r - uv				10/ 4/ 2018	12	00
E	interococc	cus (ENTERO	-HQ 1)	-01	10	/17/2018	1
L2176527-2 COLUMBIA RIVE	R	-			10/ 4/ 2018		2018/10/05
Enterc		us (ENTERO	-HQ 1)	-02	10	/17/2018	3
L2176527-3 COLUMBIA RIVER DOWNSTREAM					10/ 4/ 2018	-	JC 4x 400mL bottles
E	interococc	us (ENTERO	-HQ 1)	-03	10	/17/2018	Nos/NoI
L2176527-4 COLUMBIA RIVER SIDE CHANNEL Enteroco			-		10/4/2018		time.
		us (ENTERO	-HQ 1)	-04	10	/17/2018	
Subcontract Info Contact:		John Forb	es (40	3) 291-9897			
Analysis and reporting info co	ntact:	Nancy Sol 2559 29 9		, B. Sc.			
		CALGARY	AB T1	Y 7B5			
		Phone:	(403)	291-9897	Email: Nancy.S	onompil@	alsglobal.com
Please email confirmation	of receip	pt to:	N	lancy.Sonomp	il@alsglobal.com	n	
Shipped By:		_		Date Shipped:			
Received By:		141		Date Received:			
Verified By:				Date Verified:	-		
4			1	Temperature:	-		
Sample Integrity Issues:							



END OF REPORT



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

COC#

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

(ALS) E	En: L2176527-COFC			isgiobal.com										1.0	ac -	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Report To	;=	Report Fo	ormat / Distribut	ion		Serv	ice R	eques	sted ((Rush	for rou	utine a	nalysi	s subj	ect to a	availab [;]	ility)
Company:	Kicking Horse Mountain Resort Utility Corporation	Standard	Other			🖲 Re	- gular (Standar	rd Turr	naround	l Times	s - Busi	iness Da	ays)			
Contact:	Travis Jobin		Excel [®]	Digital	🗹 Fax	() Pri	iority (2	-4 Busi	iness D	ays) - (50% S	urcharg	ge • Coi	ntact A	LS to Cr	onfirm T	AT
Address:	1500 Kicking Horse Trail	Email 1;	tjobin@kickingh	orseresort.com			nergeno	y (1-2	Bus. O	ays) - C	100% 5	Surcha	rge - Co	ontact /	ALS to (Confirm	TAT
		Email 2:	pmajer@skircr.	com		() Sa	ime Day	or We	ekend	Emerge	ency +	Contac	t ALS t	o Confi	rm TAT		-
Phone:	250-344-8442 Fax:	Email 3:	mskyring@kicki	inghorseresort.co	<u>m</u>					A	nalys	sis Re	eques	şt 🗌			
Invoice To	Same as Report ? Yes INO	Client / P	roject Informatio	<u></u> оп		Ple	ase ir	ndicat	e bel	ow Fil	tered	, Pres	served	d or b	oth (F	, P, F/	P)
Hardcopy of Ir	nvoice with Report? Yes I No	Job #:	Week 4 - 2018	Spring EMS proc	gram - WW										\square		
Company:	Resorts of the Canadian Rockies	PO / AFE:	- r –	FALL													
Contact:	Patrick Majer ;	LSD:													1		
Address:	1505 - 17th Ave SW Calgary AB					1						ľ			1		ers
Phone:	Fax:	Quote #:				1											tai
Lab W	Vork Order #	ALS	· · · · · · · · · · · · · · · · · · ·			1							ε				5
(lab	o use only)	Contact:	LS	Sampler:	TJ/MS								difor	8			1 To
Sample	Sample Identification /		Date	Time		<u>د</u>		두	53	8	٩.	4	CO II CO	20	5		ber
#	(This description will appear on the report)		(dd-mmm-yy)	(hh:mm)	Sample Type	B	SS	Ż	N-N	Ž	l otal	Ę	eca	inte	Ŭ U		
	WWTP Effluent - UV trough Temp: (7 pH: 6.8		0644	12 00 PM	Water	X	X	X	X	X	X	X	X	X	X		5
!	Columbia River Upstream Temp: 6 pH: 70		1	1 STO PM	Water		X	X	Х	X	Х	X	X	X	X		4
	Columbia River Down stream Temp: 6 pH: 7 Q				Water		x	X	X	x	x	x	x	x	X	-	4
· ·	Columbia Biver Side Channel Tome: 6 pH: 7 0/		<u>├ </u>	<u>├ - </u>	Mator		÷	$\widehat{}$	~	$\overline{\mathbf{v}}$	~	÷	$\hat{}$				
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	Special Instructions / Regulations with water or la	nd use (CCM	I AE-Eroshwater 4	quatic Life/BC (I CSR - Commerci	ial/AB	l Tier 1	. Na	tural	etci	/ Har	 Iardo		ataile	<u> </u>		
			IL-I ICSIIIIdici J	quarie zneibe (, etty							
	Failure to complete a	Il portions o	of this form may	delay analysis.	Please fill in thi	s forn	n LEG	IBLY									
	By the use of this form the user ack	nowledges a	and agrees with	the Terms and (Conditions as p	rovide	d on	a sep	arate	e Exce	el tab	} .					
	Also provided on another Excel tab are the ALS location	on addresse	s, pho <u>ne numb</u> e	ers and sample o	container / prese	ervatio	on / h	olding	g tim	e tabl	e for	com	mon a	analy	ses.		
	SHIPMENT RELEASE (client use)	SHIP	MENT RECEPT	ION (lab use only)			SI	IIPM	ENT \	/ERIF	FICAT		(lab u	se on	y)	
Released by:	Date (dd-mmm-yy) Time (hh-mm) Received	dby	Date:	June X	Temperature:	Veri	ified b	y:		Date): 		Tim	e:		Obser	vations:
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KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received:11-OCT-18Report Date:07-MAR-19 11:00 (MT)Version:FINAL REV. 2

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2179103 Project P.O. #: NOT SUBMITTED Job Reference: WEEK 2 - 2018 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

Environmental 🕽

www.alsglobal.com

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: T.I/MS on 10-OCT-18 @ 12:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.092		0.050	mg/L		17-OCT-18	R4283643
Biochemical Oxygen Demand	<2.0		2.0	ma/L		11-OCT-18	R4281779
Orthophosphate-Dissolved (as P)	0.330		0.0050	ma/L		11-OCT-18	R4274227
Enterococcus	See Attached			5		11-OCT-18	R4294450
Coliform Bacteria - Fecal	<1		1	CFU/100mL		11-OCT-18	R4276066
MPN - E. coli	<1		1	MPN/100mL		11-OCT-18	R4275430
Phosphorus (P)-Total	0.767		0.0050	ma/L		17-OCT-18	R4283489
Total Suspended Solids	12.0		3.0	ma/L		16-OCT-18	R4283284
NO2, NO3 and Sum of NO2/NO3				5			
Nitrate in Water by IC							
Nitrate (as N)	16.7		0.020	mg/L		12-OCT-18	R4281650
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	16.7		0.050	mg/L		16-OCT-18	
Nitrite in Water by IC	0.043		0.010	ma/l		12 OCT 18	P4281650
	0.045		0.010	iiig/∟		12-001-18	R4201030
Sampled By: TI/MS on 10-OCT-18 @ 12:30							
Motrix: MATER							
Maurx. WATER Miscellaneous Parameters							
Ammonia, Total (as N)	~0.050		0.050	ma/l		17-0CT-18	R4283643
Orthonhosphate-Dissolved (as P)	<0.050		0.000	mg/L		11-OCT-18	R4203043
Enterococcus	See Attached		0.0000	iiig/ L		11-0CT-18	R4274227
Coliform Bacteria - Fecal			1	CELI/100ml		11-OCT-18	R4294430
MPN - E coli	-1		1	MPN/100mL		11-00T-18	R4270000
Phosphorus (P)-Total	<0.0050		0.0050	ma/l		17 OCT 18	R4273430
Total Suspended Solids	<0.0050		2.0050	mg/L		16-OCT-18	R4203409
NO2 NO3 and Sum of NO2/NO3	4.7		3.0	ing/∟		10-001-10	K4203204
Nitrate in Water by IC							
Nitrate (as N)	0.089		0.020	mg/L		12-OCT-18	R4281650
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.089		0.050	mg/L		16-OCT-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		12-OCT-18	R4281650
L2179103-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/MS on 10-OCT-18 @ 12:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		17-OCT-18	R4283643
Orthophosphate-Dissolved (as P)	0.0092		0.0050	mg/L		11-OCT-18	R4274227
Enterococcus	See Attached					11-OCT-18	R4294450
Coliform Bacteria - Fecal	2		1	CFU/100mL		11-OCT-18	R4276066
MPN - E. coli	<1		1	MPN/100mL		11-OCT-18	R4275430
Phosphorus (P)-Total	0.0172		0.0050	mg/L		17-OCT-18	R4283489
Total Suspended Solids	42.7		3.0	mg/L		16-OCT-18	R4283284
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	0 1 1 1		0.020	ma/l		12_OCT 10	D4204650
	0.111		0.020	iiig/L		12-001-10	124201000
Nitrate and Nitrite (as N)	0.111		0.050	ma/L		16-OCT-18	
· · /				3 -			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Par	rameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
1.2170402.0								
Sampled By T.L	/MS on 10-OCT-18 @ 12:30							
Matrix: WA	ATER							
Nitrite in Water	by IC							
Nitrite (as N)		<0.010		0.010	mg/L		12-OCT-18	R4281650
L2179103-4 CC	DLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ	/MS on 10-OCT-18 @ 12:30							
Matrix: W/	ATER							
Miscellaneous I	Parameters						17 007 10	B / 9 9 9 / 9
Ammonia, Total	(as N) Disashuad (as D)	<0.050		0.050	mg/L		17-OCT-18	R4283643
Entergage	-Dissolved (as P)	<0.0050		0.0050	mg/L		11-0CT-18	R4274227
Coliform Bacteri	a - Fecal			1	CEU/100ml		11-OCT-18	R4294450
MPN - E coli		-1		1	MPN/100mL		11-OCT-18	R4270000
Phosphorus (P)-	Total	0.0065		0.0050	ma/l		17-OCT-18	R4283489
Total Suspended	d Solids	6.0		3.0	ma/L		16-OCT-18	R4283284
NO2, NO3 and Su	Im of NO2/NO3							
Nitrate in Water	r by IC							
Nitrate (as N)		0.103		0.020	mg/L		12-OCT-18	R4281650
Nitrate+Nitrite	e (as N)	0 102		0.050	ma/l		16 OCT 19	
Nitrite in Water	hy IC	0.103		0.050	ing/∟		10-001-10	
Nitrite (as N)	by 10	<0.010		0.010	mg/L		12-OCT-18	R4281650
					1			

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

Reference Information

L2179103 CONTD.... PAGE 4 of 5 Version: FINAL REV

	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is carried o oxygen demand (BOD) a dissolved oxygen meter. BOD (CBOD) is determir	out using proc are determine Dissolved BC ned by adding	edures adapted from APHA Method 5210B - " d by diluting and incubating a sample for a spe DD (SOLUBLE) is determined by filtering the s g a nitrification inhibitor to the diluted sample p	Biochemical Oxygen Demand (BOD)". All forms of biochemical cified time period, and measuring the oxygen depletion using a ample through a glass fibre filter prior to dilution. Carbonaceous rior to incubation.
EC-MPN-CL	Water	MPN - E. coli	APHA 9223B
This analysis is carried o Substrate Coliform Test" sample is mixed with a m The packet is incubated response are counted. T probability table. Recommended Holding Sample: 1 day Reference: APHA	ut using proc . E. coli and [⊤] nixture hydrol for 18 or 24 h he final result Time:	edures adapted from APHA Method 9223 "En: Total Coliform are determined simultaneously. yzable substrates and then sealed in a multi-w ours and then the number of wells exhibiting a is obtained by comparing the positive response	zyme The ell packet. positive ses to a
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is carried o Coliform bacteria is enun involves an initial 24 hou bacteria (Fecal) and is u	out using proc nerated by cu r incubation a sed for non-tu	edures adapted from APHA Method 9222 "Me ilturing and colony counting. A known sample at 44.5 degrees C of the filter with the appropria irbid water with a low background bacteria leve	mbrane Filter Technique for Members of the Coliform Group". volume is filtered through a 0.45 micron membrane filter. The test ate growth medium. This method is specific for thermotolerant el.
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried o of Chemistry, "Flow-injec al.	out, on sulfurio ction analysis	c acid preserved samples, using procedures m with fluorescence detection for the determinat	odified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society on 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)
norgania aniona ara ana	lyzed by lon (Chromatography with conductivity and/or UV d	etection.
inorganic amons are ana	ayzed by lon		
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
NO3-IC-N-CL Inorganic anions are ana	Water	Nitrate in Water by IC Chromatography with conductivity and/or UV d	EPA 300.1 (mod) etection.
NO3-IC-N-CL Inorganic anions are ana P-T-COL-CL	Water Ilyzed by Ion (Water	Nitrate in Water by IC Chromatography with conductivity and/or UV d Total P in Water by Colour	EPA 300.1 (mod) etection. APHA 4500-P PHOSPHORUS
NO3-IC-N-CL Inorganic anions are ana P-T-COL-CL This analysis is carried o persulphate digestion of	Water Ilyzed by Ion Water wut using proc the sample.	Nitrate in Water by IC Chromatography with conductivity and/or UV d Total P in Water by Colour edures adapted from APHA Method 4500-P "F	EPA 300.1 (mod) etection. APHA 4500-P PHOSPHORUS Phosphorus". Total Phosphorus is determined colourimetrically afte
NO3-IC-N-CL Inorganic anions are ana P-T-COL-CL This analysis is carried o persulphate digestion of PO4-DO-COL-CL	Water Ilyzed by Ion (Water out using proc the sample. Water	Nitrate in Water by IC Chromatography with conductivity and/or UV d Total P in Water by Colour edures adapted from APHA Method 4500-P "F Diss. Orthophosphate in Water by Colour	EPA 300.1 (mod) etection. APHA 4500-P PHOSPHORUS Phosphorus". Total Phosphorus is determined colourimetrically afte APHA 4500-P PHOSPHORUS
NO3-IC-N-CL Inorganic anions are ana P-T-COL-CL This analysis is carried o persulphate digestion of PO4-DO-COL-CL This analysis is carried o colourimetrically on a sar	Water Water Water out using proc the sample. Water out using proc mple that has	Nitrate in Water by IC Chromatography with conductivity and/or UV d Total P in Water by Colour edures adapted from APHA Method 4500-P "F Diss. Orthophosphate in Water by Colour edures adapted from APHA Method 4500-P "F been lab or field filtered through a 0.45 micro	EPA 300.1 (mod) etection. APHA 4500-P PHOSPHORUS Phosphorus". Total Phosphorus is determined colourimetrically afte APHA 4500-P PHOSPHORUS Phosphorus". Dissolved Orthophosphate is determined in membrane filter.
NO3-IC-N-CL Inorganic anions are ana P-T-COL-CL This analysis is carried o persulphate digestion of PO4-DO-COL-CL This analysis is carried o colourimetrically on a sar	Water Water Water out using proc the sample. Water out using proc mple that has Water	Nitrate in Water by IC Chromatography with conductivity and/or UV d Total P in Water by Colour edures adapted from APHA Method 4500-P "F Diss. Orthophosphate in Water by Colour edures adapted from APHA Method 4500-P "F been lab or field filtered through a 0.45 micro Total Suspended Solids	EPA 300.1 (mod) etection. APHA 4500-P PHOSPHORUS Phosphorus". Total Phosphorus is determined colourimetrically after APHA 4500-P PHOSPHORUS Phosphorus". Dissolved Orthophosphate is determined membrane filter. APHA 2540 D-Gravimetric
NO3-IC-N-CL Inorganic anions are ana P-T-COL-CL This analysis is carried o persulphate digestion of PO4-DO-COL-CL This analysis is carried o colourimetrically on a sau TSS-CL This analysis is carried o (TSS) are determined by	Water Water Water out using proc the sample. Water out using proc mple that has Water out using proc filtering a sa	Nitrate in Water by IC Chromatography with conductivity and/or UV d Total P in Water by Colour edures adapted from APHA Method 4500-P "F Diss. Orthophosphate in Water by Colour edures adapted from APHA Method 4500-P "F been lab or field filtered through a 0.45 micro Total Suspended Solids edures adapted from APHA Method 2540 "Sol mple through a glass fibre filter, and by drying	EPA 300.1 (mod) etection. APHA 4500-P PHOSPHORUS Phosphorus". Total Phosphorus is determined colourimetrically afte APHA 4500-P PHOSPHORUS Phosphorus". Dissolved Orthophosphate is determined membrane filter. APHA 2540 D-Gravimetric ids". Solids are determined gravimetrically. Total suspended solids the filter at 104 deg. C.
NO3-IC-N-CL Inorganic anions are ana P-T-COL-CL This analysis is carried o persulphate digestion of PO4-DO-COL-CL This analysis is carried o colourimetrically on a sat TSS-CL This analysis is carried o (TSS) are determined by	Water Water Water out using proc the sample. Water out using proc mple that has Water out using proc filtering a sa	Nitrate in Water by IC Chromatography with conductivity and/or UV d Total P in Water by Colour edures adapted from APHA Method 4500-P "F Diss. Orthophosphate in Water by Colour edures adapted from APHA Method 4500-P "F been lab or field filtered through a 0.45 microir Total Suspended Solids edures adapted from APHA Method 2540 "Sol mple through a glass fibre filter, and by drying	EPA 300.1 (mod) etection. APHA 4500-P PHOSPHORUS Phosphorus". Total Phosphorus is determined colourimetrically afte APHA 4500-P PHOSPHORUS Phosphorus". Dissolved Orthophosphate is determined nembrane filter. APHA 2540 D-Gravimetric ids". Solids are determined gravimetrically. Total suspended solids the filter at 104 deg. C.

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

Reference Information

L2179103 CONTD.... PAGE 5 of 5 Version: FINAL REV

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



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			Qualit	y Conti	rol Report			
		Workorder:	L217910	3	Report Date: 0	7-MAR-19	Pa	ge 1 of 3
Client: KICKING 1505 - 17 CALGAR Contact: TRAVIS	HORSE MOUN 7th AVENUE SN RY AB T2T 0E2 JOBIN	ITAIN UTILITY C N	ORPORATIC	DN				
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	Water							
Batch R4281779 WG2904987-5 LCS Biochemical Oxygen De	emand		89.7		%		85-115	11-OCT-18
WG2904987-4 MB Biochemical Oxygen De	emand		<2.0		mg/L		2	11-OCT-18
EC-MPN-CL Batch R4275430 WG2902209-4 MB MPN - E. coli	Water		<1		MPN/100mL		1	11-OCT-18
FCC-MF-CL Batch R4276066 WG2902430-1 MB	Water							
Coliform Bacteria - Feca WG2902430-3 MB Coliform Bacteria - Feca	al al		<1 <1		CFU/100mL CFU/100mL		1 1	11-OCT-18 11-OCT-18
NH3-F-CL Batch R4283643 WG2906483-10 LCS	Water							
Ammonia, Total (as N) WG2906483-9 MB Ammonia, Total (as N)			98.1 <0.050		% mg/L		85-115 0.05	17-OCT-18 17-OCT-18
NO2-IC-N-CL Batch R4281650	Water							
WG2905049-10 LCS Nitrite (as N) WG2905049-9 MB			105.5		%		90-110	12-OCT-18
Nitrite (as N)			<0.010		mg/L		0.01	12-OCT-18
NO3-IC-N-CL Batch R4281650 WG2905049-10 LCS Nitrate (as N)	Water		100.8		%		90-110	12 007 19
WG2905049-9 MB Nitrate (as N)			<0.020		mg/L		0.02	12-0CT-18
P-T-COL-CL	Water							

Water



Quality Control Report

		Workorder	: L217910	3	Report Date: 0	7-MAR-19	Pa	ge 2 of 3
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-CL	Water							
Batch R42834 WG2906340-10 LCS Phosphorus (P)-Tota	89 S		99.1		%		80.120	17 OCT 19
WG2906340-9 MB Phosphorus (P)-Tota	I		<0.0050		mg/L		0.005	17-OCT-18
PO4-DO-COL-CL	Water							
Batch R42742 WG2901676-18 LCS Orthophosphate-Diss	27 5 solved (as P)		99.0		%		80-120	11-OCT-18
WG2901676-17 MB Orthophosphate-Diss	olved (as P)		<0.0050		mg/L		0.005	11-OCT-18
TSS-CL	Water							
Batch R42832 WG2904906-2 LCS Total Suspended Sol	84 5 ids		96.0		%		85-115	16-OCT-18
WG2904906-1 MB Total Suspended Sol	ids		<3.0		mg/L		3	16-OCT-18

Quality Control Report

Workorder: L2179103

Report Date: 07-MAR-19

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.



Microbial Test Results

Samples collected October 10, 2018

Final Report

October 23, 2018

Submitted to:

ALS Environmental Calgary, AB

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



SAMPLE INFORMATION

Sample ID/ Internal ID	Collected Received		Enterococcus test initiation	Receipt temperature	
L2179103-1 WWTP EFFLUENT – UV TROUGH/ 1819-0257-01	10-Oct-18 at 1230h	11-Oct-18 at 1125h	11-Oct-18 at 1155h	5.0°C	
L2179103-2 COLUMBIA RIVER UPSTREAM/ 1819-0257-02	10-Oct-18 at 1230h	11-Oct-18 at 1125h	11-Oct-18 at 1155h	4,9°C	
L2179103-3 COLUMBIA RIVER DOWNSTREAM/ 1819-0257-03	10-Oct-18 at 1230h	11-Oct-18 at 1125h	11-Oct-18 at 1155h	5.0°C	
L2179103-4 COLUMBIA RIVER SIDE CHANNEL/ 1819-0257-04	10-Oct-18 at 1230h	11-Oct-18 at 1125h	11-Oct-18 at 1155h	5.1°C	

TEST TYPES

Enterococcus enumeration test

RESULTS

Microbial test results

	MPN/100 mL					
Sample ID	Enterococcus					
L2179103-1 WWTP EFFLUENT – UV TROUGH	<1					
L2179103-2 COLUMBIA RIVER UPSTREAM	<1					
L2179103-3 COLUMBIA RIVER DOWNSTREAM	2.0					
L2179103-4 COLUMBIA RIVER SIDE CHANNEL	1.0					

MPN = Most Probable Number



QA/QC

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



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Report By: Courtney Bogstie, BSc Biologist

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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



APPENDIX A – Test data

6 ENVIRONMENTAL	Quanti-Tray Bench Sheet - Enterococcu
Test Initiation Date: 2018/10111	Client ALSJOU Reference 1819-0257 Reagent used: Enterolert ^{IM} Dilution Factor
Techician: (B) Thermometer Serial #: $16090347S$ Incubator #: 7 (must be 41 ± 0.5°C)	Reagent Lot#/Expiry: P (ol 0/ OU Pr/o, 2009 Comments: Quanti Tray 2000 Lot#/Expiry: (APO 10) 17-1024
Results - 24 Hour Incubation Date: 2018/1012 Tim	ne: 1200 Technician: M.
Incubator Temp: (must be 41 ± 0.5°C)	1819 - 2257 Enterococci (Fluorescent)
# Positive Large Wells: # Ambiguous Large Wells: # Positive Small Wells (2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 200	HO - 50 - 00
# Ambiguous Small Wells (Tray 2000 only): Most Probable Number at 24 hours:	
Results - 28 Hour Incubation Date: ZolS 1012 Time	e: Lecto Technician: M
Incubator Temp: (must be 41 ± 0.5°C)	Enterococci (Fluorescent)
# Confirmed Positive Large Wells: # Confirmed Positive Small Wells (Trav 2000 onto):	
Most Probable Number at 28 hours:	

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

Nautilus Environmental (Calgary)

File: ENT F106



APPENDIX B – Chain-of-custody form

Subcontract Request Formubcontract To: NAUTILUS ENVIRONMENTAL COMPANY INC CALGARY, AB, CAN #4, 6125-12 STREET SE CALGARY, AB T2H 2K1 NOTES: Please reference on final report and invoice: PO# L2129103 ALS requires QC data to be provided with your final results. Please see enclosed 4 sample(s) in 4 Container(s) SAMPLE NUMBER DAT 1619-0257 ANALYTICAL REQUIRED 12179103-1 WWTP EFFLUENT - UV TROUGH 201%/10/11 10/ 125 10/ 125 -01 Enterococcus (ENTERO-HQ 1) Drop offices WoS/NoT 10/ 10/ 10/ 10/ 505/NoT 10/ 10/ 10/ 10/ 10/ 10/ 505/NoT 10/ 10/ 10/ 10/ 10/ 505/NoT 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 505/NoT 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/	n IADA
ubcontract To: NAUTILUS ENVIRONMENTAL COMPANY INC CALGARY, AB, CAN #4, 6125-12 STREET SE CALGARY, AB T2H 2K1 NOTES: Please reference on final report and invoice: PO# L2179103 ALS requires QC data to be provided with your final results. Please see enclosed 4 sample(s) in 4 Container(s) SAMPLE DAT NUMBER DAT 18/9 -0).5 7 ANALYTICAL REQUIRED 10/ 12179103-1 WWTP EFFLUENT - UV 20/8//10//11 10/ -01 Enterococcus (ENTERO-HQ 1) 10/ 10/ -02 Enterococcus (ENTERO-HQ 1) 50//00 L, bottles 10/ -02 Enterococcus (ENTERO-HQ 1) 6000 condition 10/ -03 Enterococcus (ENTERO-HQ 1) 10/ 10/ -041 Enterococcus (ENTERO-HQ 1) 10/ 10/ Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	
NOTES: Please reference on final report and invoice: PO# L2129103 ALS requires QC data to be provided with your final results. Please see enclosed 4 sample(s) in 4 Container(s) SAMPLE NUMBER DAT 1819-0257 ANALYTICAL REQUIRED DAT 12179103-1 WWTP EFFLUENT - UV 201%/10/11 10/ 1.25 201 Enterococcus (ENTERO-HQ 1) 10/ 1.25 10/ 1.25 2179103-2 COLUMBIA RIVER UPSTREAM 02 Enterococcus (ENTERO-HQ 1) 2179103-3 COLUMBIA RIVER OO3 Enterococcus (ENTERO-HQ 1) 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/	
Please see enclosed 4 sample(s) in 4 Container(s) SAMPLE NUMBER DAT 1619-0257 ANALYTICAL REQUIRED L2179103-1 WWTP EFFLUENT - UV TROUGH 201%/10/11 125 10/ 125 -01 Enterococcus (ENTERO-HQ 1) Up of 10 4200 mL bottles L2179103-2 COLUMBIA RIVER UPSTREAM Drop of 10 500 condition 10/ 6000 condition L2179103-3 COLUMBIA RIVER DOWN STREAM 10/ -03 Enterococcus (ENTERO-HQ 1) 10/ 6000 condition L2179103-4 COLUMBIA RIVER SIDE CHANNEL 10/ Enterococcus (ENTERO-HQ 1) 10/ Enterococcus (ENTERO-HQ 1) Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl Email:	
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L2179103-1 WWTP EFFLUENT - UV TROUGH -01 Enterococcus (ENTERO-HQ 1) L2179103-2 COLUMBIA RIVER UPSTREAM -02 Enterococcus (ENTERO-HQ 1) L2179103-3 COLUMBIA RIVER DOWN STREAM -03 Enterococcus (ENTERO-HQ 1) L2179103-4 COLUMBIA RIVER SIDE CHANNEL -04 Enterococcus (ENTERO-HQ 1) L2179103-4 COLUMBIA RIVER SIDE CHANNEL -04 Enterococcus (ENTERO-HQ 1) Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	DUE DATE Flag
L2179103-2 COLUMBIA RIVER UPSTREAM -02 Enterococcus (ENTERO-HQ 1) L2179103-3 COLUMBIA RIVER DOWN STREAM -03 Enterococcus (ENTERO-HQ 1) L2179103-4 COLUMBIA RIVER SIDE CHANNEL -04 Enterococcus (ENTERO-HQ 1) Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	10/2018 1230 5.0 10/23/2018
L2179103-3 COLUMBIA RIVER DOWN 10/ STREAM -0.3 Enterococcus (ENTERO-HQ 1) L2179103-4 COLUMBIA RIVER SIDE 10/ CHANNEL 10/ -0.4 Enterococcus (ENTERO-HQ 1) Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY, AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	10/2018 1230 4.9 10/23/2018
L2179103-4 COLUMBIA RIVER SIDE 10/ CHANNEL 10/ ーのり Enterococcus (ENTERO-HQ 1) Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	10/2018 12.30 5.0 10/23/2018
Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	10/2018 1230 5.1 10/23/2018
Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	
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END OF REPORT





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

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

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Contact:	Patrick Majer	LSD:																
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Microbial Test Results

Samples collected October 10, 2018

Final Report

October 23, 2018

Submitted to:

ALS Environmental Calgary, AB

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



SAMPLE INFORMATION

		Dates					
Sample ID/ Internal ID	Collected	Received	Enterococcus test initiation	Receipt temperature			
L2179103-1 WWTP EFFLUENT – UV TROUGH/ 1819-0257-01	10-Oct-18 at 1230h	11-Oct-18 at 1125h	11-Oct-18 at 1155h	5.0°C			
L2179103-2 COLUMBIA RIVER UPSTREAM/ 1819-0257-02	10-Oct-18 at 1230h	11-Oct-18 at 1125h	11-Oct-18 at 1155h	4,9°C			
L2179103-3 COLUMBIA RIVER DOWNSTREAM/ 1819-0257-03	10-Oct-18 at 1230h	11-Oct-18 at 1125h	11-Oct-18 at 1155h	5.0°C			
L2179103-4 COLUMBIA RIVER SIDE CHANNEL/ 1819-0257-04	10-Oct-18 at 1230h	11-Oct-18 at 1125h	11-Oct-18 at 1155h	5.1°C			

TEST TYPES

Enterococcus enumeration test

RESULTS

Microbial test results

	MPN/100 mL					
Sample ID	Enterococcus					
L2179103-1 WWTP EFFLUENT – UV TROUGH	<1					
L2179103-2 COLUMBIA RIVER UPSTREAM	<1					
L2179103-3 COLUMBIA RIVER DOWNSTREAM	2.0					
L2179103-4 COLUMBIA RIVER SIDE CHANNEL	1.0					

MPN = Most Probable Number



QA/QC

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



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Report By: Courtney Bogstie, BSc Biologist

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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



APPENDIX A – Test data

6 ENVIRONMENTAL	Quanti-Tray Bench Sheet - Enterococcu
Test Initiation Date: 2018/10111	Client ALSJOU Reference 1819-0257 Reagent used: Enterolert ^{IM} Dilution Factor
Techician: (B) Thermometer Serial #: $16090347S$ Incubator #: 7 (must be 41 ± 0.5°C)	Reagent Lot#/Expiry: P (ol 0/ OU Pr/o, 2009 Comments: Quanti Tray 2000 Lot#/Expiry: (APO 10) 17-1024
Results - 24 Hour Incubation Date: 2018/1012 Tim	ne: 1200 Technician: M.
Incubator Temp: (must be 41 ± 0.5°C)	1819 - 2257 Enterococci (Fluorescent)
# Positive Large Wells: # Ambiguous Large Wells: # Positive Small Wells (2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 200	HO - 50 - 00
# Ambiguous Small Wells (Tray 2000 only): Most Probable Number at 24 hours:	
Results - 28 Hour Incubation Date: ZolS 1012 Time	e: Lecto Technician: M
Incubator Temp: (must be 41 ± 0.5°C)	Enterococci (Fluorescent)
# Confirmed Positive Large Wells: # Confirmed Positive Small Wells (Trav 2000 onto):	
Most Probable Number at 28 hours:	

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

Nautilus Environmental (Calgary)

File: ENT F106



APPENDIX B – Chain-of-custody form

Subcontract Request Formubcontract To: NAUTILUS ENVIRONMENTAL COMPANY INC CALGARY, AB, CAN #4, 6125-12 STREET SE CALGARY, AB T2H 2K1 NOTES: Please reference on final report and invoice: PO# L2129103 ALS requires QC data to be provided with your final results. Please see enclosed 4 sample(s) in 4 Container(s) SAMPLE NUMBER DAT 1619-0257 ANALYTICAL REQUIRED 12179103-1 WWTP EFFLUENT - UV TROUGH 201%/10/11 10/ 125 10/ 125 -01 Enterococcus (ENTERO-HQ 1) Drop offices WoS/NoT 10/ 10/ 10/ 10/ 505/NoT 10/ 10/ 10/ 10/ 10/ 10/ 505/NoT 10/ 10/ 10/ 10/ 10/ 505/NoT 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 505/NoT 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/	n IADA
ubcontract To: NAUTILUS ENVIRONMENTAL COMPANY INC CALGARY, AB, CAN #4, 6125-12 STREET SE CALGARY, AB T2H 2K1 NOTES: Please reference on final report and invoice: PO# L2179103 ALS requires QC data to be provided with your final results. Please see enclosed 4 sample(s) in 4 Container(s) SAMPLE DAT NUMBER DAT 18/9 -0).5 7 ANALYTICAL REQUIRED 10/ 12179103-1 WWTP EFFLUENT - UV 20/8//10//11 10/ -01 Enterococcus (ENTERO-HQ 1) 10/ 10/ -02 Enterococcus (ENTERO-HQ 1) 50//00 L, bottles 10/ -02 Enterococcus (ENTERO-HQ 1) 6000 condition 10/ -03 Enterococcus (ENTERO-HQ 1) 10/ 10/ -041 Enterococcus (ENTERO-HQ 1) 10/ 10/ Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	
NOTES: Please reference on final report and invoice: PO# L2129103 ALS requires QC data to be provided with your final results. Please see enclosed 4 sample(s) in 4 Container(s) SAMPLE NUMBER DAT 1819-0257 ANALYTICAL REQUIRED DAT 12179103-1 WWTP EFFLUENT - UV 201%/10/11 10/ 1.25 201 Enterococcus (ENTERO-HQ 1) 10/ 1.25 10/ 1.25 2179103-2 COLUMBIA RIVER UPSTREAM 02 Enterococcus (ENTERO-HQ 1) 2179103-3 COLUMBIA RIVER OO3 Enterococcus (ENTERO-HQ 1) 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/	
Please see enclosed 4 sample(s) in 4 Container(s) SAMPLE NUMBER DAT 1619-0257 ANALYTICAL REQUIRED L2179103-1 WWTP EFFLUENT - UV TROUGH 201%/10/11 125 10/ 125 -01 Enterococcus (ENTERO-HQ 1) Up of 10 4200 mL bottles L2179103-2 COLUMBIA RIVER UPSTREAM Drop of 10 500 condition 10/ 6000 condition L2179103-3 COLUMBIA RIVER DOWN STREAM 10/ -03 Enterococcus (ENTERO-HQ 1) 10/ 6000 condition L2179103-4 COLUMBIA RIVER SIDE CHANNEL 10/ Enterococcus (ENTERO-HQ 1) 10/ Enterococcus (ENTERO-HQ 1) Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl Email:	
SAMPLE NUMBER DAT 1819-0257 ANALYTICAL REQUIRED L2179103-1 WWTP EFFLUENT - UV -01 Enterococcus (ENTERO-HQ 1) -01 Enterococcus (ENTERO-HQ 1) UPSTREAM -02 -02 Enterococcus (ENTERO-HQ 1) -03 Enterococcus (ENTERO-HQ 1) -03 Enterococcus (ENTERO-HQ 1) -04 Enterococcus (ENTERO-HQ 1) -05 Enterococcus (ENTERO-HQ 1) -06 Enterococcus (ENTERO-HQ 1) -07 Enterococcus (ENTERO-HQ 1) -08 Enterococcus (ENTERO-HQ 1) -09 Enterococcus (ENTERO-HQ 1) -01 Enterococcus (ENTERO-HQ 1) -02 Enterococcus (ENTERO-HQ 1) -01 Enterococcus (ENTERO-HQ 1) -01 Enterococcus (ENTERO-HQ 1) Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB TIY 7B5 Phone: (403) 291-9897 Enterol Phone:	
L2179103-1 WWTP EFFLUENT - UV TROUGH -01 Enterococcus (ENTERO-HQ 1) L2179103-2 COLUMBIA RIVER UPSTREAM -02 Enterococcus (ENTERO-HQ 1) L2179103-3 COLUMBIA RIVER DOWN STREAM -03 Enterococcus (ENTERO-HQ 1) L2179103-4 COLUMBIA RIVER SIDE CHANNEL -04 Enterococcus (ENTERO-HQ 1) L2179103-4 COLUMBIA RIVER SIDE CHANNEL -04 Enterococcus (ENTERO-HQ 1) Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	DUE DATE Flag
L2179103-2 COLUMBIA RIVER UPSTREAM -02 Enterococcus (ENTERO-HQ 1) L2179103-3 COLUMBIA RIVER DOWN STREAM -03 Enterococcus (ENTERO-HQ 1) L2179103-4 COLUMBIA RIVER SIDE CHANNEL -04 Enterococcus (ENTERO-HQ 1) Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	10/2018 1230 5.0 10/23/2018
L2179103-3 COLUMBIA RIVER DOWN 10/ STREAM -0.3 Enterococcus (ENTERO-HQ 1) L2179103-4 COLUMBIA RIVER SIDE 10/ CHANNEL 10/ -0.4 Enterococcus (ENTERO-HQ 1) Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY, AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	10/2018 1230 4.9 10/23/2018
L2179103-4 COLUMBIA RIVER SIDE 10/ CHANNEL 10/ ーのり Enterococcus (ENTERO-HQ 1) Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	10/2018 12.30 5.0 10/23/2018
Subcontract Info Contact: John Forbes (403) 291-9897 Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	10/2018 1230 5.1 10/23/2018
Analysis and reporting info contact: Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	
Phone: (403) 291-9897 Email: Please email confirmation of receipt to: Nancy.Sonompil@alsgl	Nanau Canamail@alcalabal.com
	obal.com
Snipped by: Date Snipped:	
Received By: Date Received:	
Verified By:Date Verified:	
Temperature:	



END OF REPORT



KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received:17-OCT-18Report Date:07-MAR-19 11:01 (MT)Version:FINAL REV. 3

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2182289 Project P.O. #: NOT SUBMITTED Job Reference: WEEK 3 - 2018 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

Environmental 🕽

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: T.J on 16-OCT-18 @ 12:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.082		0.050	mg/L		22-OCT-18	R4292091
Biochemical Oxygen Demand	<2.0		2.0	ma/L		18-OCT-18	R4294669
Orthophosphate-Dissolved (as P)	0.527		0.0050	ma/L		18-OCT-18	R4288687
Enterococcus	See Attached			3		17-OCT-18	R4311728
Coliform Bacteria - Fecal	<1		1	CFU/100mL		17-OCT-18	R4287047
MPN - E. coli	<1		1	MPN/100mL		17-OCT-18	R4287008
Phosphorus (P)-Total	0.792		0.0050	ma/L		20-OCT-18	R4289779
Total Suspended Solids	9.3		3.0	ma/L		19-OCT-18	R4294912
NO2, NO3 and Sum of NO2/NO3	0.0		010				
Nitrate in Water by IC							
Nitrate (as N)	15.1		0.020	mg/L		18-OCT-18	R4288567
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	15.2		0.050	mg/L		19-OCT-18	
Nitrite in Water by IC	0.000		0.040			40.007.40	D 4000507
	0.039		0.010	mg/∟		18-001-18	R4288567
L2182289-2 COLUMBIA RIVER UPSTREAM							
Sampled By: IJ on 16-OCI-18 @ 12:30							
Matrix: WATER							
Miscellaneous Parameters	0.050		0.050			00 OOT 40	D 4000004
Ammonia, Total (as N)	<0.050		0.050	mg/∟		22-0CT-18	R4292091
	<0.0050		0.0050	mg/∟		18-0CT-18	R4288687
Californ Destaria Facal	See Attached		4			17-001-18	R4311728
Collform Bacteria - Fecal	2	000	1			17-001-18	R4287047
MPN - E. COII Dheapharus (D) Total	2	UCK	1	MPN/100mL		17-0CT-18	R4287008
Filosphorus (P)-rotai	<0.0050		0.0050	mg/∟		20-0CT-18	R4289779
lotal Suspended Solids	3.3		3.0	mg/L		19-001-18	R4294912
Noz, NOS and Sum of NOZ/NOS							
Nitrate (as N)	0.090		0.020	ma/L		18-OCT-18	R4288567
Nitrate+Nitrite	0.000		0.020				
Nitrate and Nitrite (as N)	0.090		0.050	mg/L		19-OCT-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		18-OCT-18	R4288567
L2182289-3 COLUMBIA RIVER DOWNSTREAM							
Sampled By: TJ on 16-OCT-18 @ 12:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		22-OCT-18	R4292091
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		18-OCT-18	R4288687
Enterococcus	See Attached					17-OCT-18	R4311728
Coliform Bacteria - Fecal	1		1	CFU/100mL		17-OCT-18	R4287047
MPN - E. coli	<1		1	MPN/100mL		17-OCT-18	R4287008
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		20-OCT-18	R4289779
Total Suspended Solids	6.7		3.0	mg/L		19-OCT-18	R4294912
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	0.095		0.020	mg/L		18-OCT-18	R4288567
Nitrate+Nitrite	0.005		0.050	ma//		10 007 40	
ויונומוש מווע ויונוונש (מז ויי)	0.095		0.050	ing/∟		19-001-10	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.
ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
1 2182289-3 COLUMBIA RIVER DOWNSTREAM							
Sampled By: TJ on 16-OCT-18 @ 12:30							
Matrix: WATER							
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		18-OCT-18	R4288567
L2182289-4 COLUMBIA RIVER SIDE CHANNEL							
Sampled By: TJ on 16-OCT-18 @ 12:30							
Matrix: WATER Miscellaneous Parameters							
Ammonia. Total (as N)	<0.050		0.050	ma/l		22-OCT-18	R4292091
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		18-OCT-18	R4288687
Enterococcus	See Attached			5		17-OCT-18	R4311728
Coliform Bacteria - Fecal	1		1	CFU/100mL		17-OCT-18	R4287047
MPN - E. coli	1	OCR	1	MPN/100mL		17-OCT-18	R4287008
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		20-OCT-18	R4289779
Total Suspended Solids	<3.0		3.0	mg/L		19-OCT-18	R4294912
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC Nitrate (as N)	0.086		0 020	ma/l		18-OCT-18	R4288567
Nitrate+Nitrite	0.000		0.020	iiig/ E			114200307
Nitrate and Nitrite (as N)	0.086		0.050	mg/L		19-OCT-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		18-OCT-18	R4288567

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

Reference Information

Sample Parameter Qualifier Key:

Chain of Custody Numbers:

Qualifier	Description		
OCR	Parameter is out of	client specific range.	
est Method	References:		
ALS Test Code	e Matrix	Test Description	Method Reference**
30D-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is oxygen deman dissolved oxyg 3OD (CBOD) i	carried out using proc d (BOD) are determined en meter. Dissolved BC s determined by adding	edures adapted from APHA Method 5210B - "B d by diluting and incubating a sample for a spec DD (SOLUBLE) is determined by filtering the sa a nitrification inhibitor to the diluted sample pri	iochemical Oxygen Demand (BOD)". All forms of biochemical cified time period, and measuring the oxygen depletion using a mple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
EC-MPN-CL	Water	MPN - E. coli	APHA 9223B
This analysis is Substrate Colif sample is mixe The packet is i response are c orobability table Recommendec Sample: 1 day Reference: AP	s carried out using proc orm Test". E. coli and T d with a mixture hydroly ncubated for 18 or 24 h ounted. The final result e. I Holding Time:	edures adapted from APHA Method 9223 "Enz Total Coliform are determined simultaneously. T yzable substrates and then sealed in a multi-we ours and then the number of wells exhibiting a is obtained by comparing the positive response	yme The III packet. positive es to a
CC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is Coliform bacte nvolves an init pacteria (Fecal	s carried out using proc ria is enumerated by cu ial 24 hour incubation a) and is used for non-tu	edures adapted from APHA Method 9222 "Men Ituring and colony counting. A known sample v it 44.5 degrees C of the filter with the appropria Irbid water with a low background bacteria level	nbrane Filter Technique for Members of the Coliform Group". olume is filtered through a 0.45 micron membrane filter. The test te growth medium. This method is specific for thermotolerant
N2N3-CALC-C	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is of Chemistry, " al.	s carried out, on sulfurio Flow-injection analysis	c acid preserved samples, using procedures mo with fluorescence detection for the determination	odified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society on 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)
norganic anior	ns are analyzed by Ion	Chromatography with conductivity and/or UV de	etection.
103-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
norganic anior	is are analyzed by Ion (Chromatography with conductivity and/or UV de	etection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is persulphate dig	s carried out using proc pestion of the sample.	edures adapted from APHA Method 4500-P "Pl	nosphorus". Total Phosphorus is determined colourimetrically after
PO4-DO-COL-	CL Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is colourimetrical	carried out using proc y on a sample that has	edures adapted from APHA Method 4500-P "Pl been lab or field filtered through a 0.45 micron	nosphorus". Dissolved Orthophosphate is determined membrane filter.
SS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is TSS) are dete	s carried out using proc rmined by filtering a sa	edures adapted from APHA Method 2540 "Solio mple through a glass fibre filter, and by drying t	ds". Solids are determined gravimetrically. Total suspended solids he filter at 104 deg. C.
ALS test meth	ods may incorporate m	odifications from specified reference methods	to improve performance.
The last two le	tters of the above test o	code(s) indicate the laboratory that performed a	nalytical analysis for that test. Refer to the list below:
Laboratory De	finition Code Lab	oratory Location	
CL	ALS	ENVIRONMENTAL - CALGARY, ALBERTA, C	ANADA

Reference Information

L2182289 CONTD.... PAGE 5 of 5 Version: FINAL REV

Test Method References:

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

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



Workorder: L2182289

Report Date: 07-MAR-19

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 R4294669 WG2911409-3 DUP Biochemical Oxygen De	emand	L2182289-1 <2.0	<2.0	RPD-NA	mg/L	N/A	20	18-OCT-18
WG2911409-2 LCS Biochemical Oxygen De	emand		87.1		%		85-115	18-OCT-18
WG2911409-1 MB Biochemical Oxygen De	emand		<2.0		mg/L		2	18-OCT-18
EC-MPN-CL	Water							
Batch R4287008 WG2907823-3 MB MPN - E. coli			<1		MPN/100mL		1	17-OCT-18
FCC-MF-CL	Water							
Batch R4287047 WG2907836-1 MB Coliform Bacteria - Feca	al		<1		CFU/100mL		1	17-OCT-18
NH3-F-CL	Water							
Batch R4292091 WG2910645-14 LCS Ammonia, Total (as N)			104.3		%		85-115	22-OCT-18
WG2910645-13 MB Ammonia, Total (as N)			<0.050		mg/L		0.05	22-OCT-18
NO2-IC-N-CL	Water							
Batch R4288567 WG2908655-2 LCS Nitrite (as N)			104 6		%		00 110	19 007 19
WG2908655-1 MB Nitrite (as N)			<0.010		mg/L		0.01	18-OCT-18
NO3-IC-N-CL	Water							
Batch R4288567								
WG2908655-2 LCS Nitrate (as N)			97.0		%		90-110	18-OCT-18
WG2908655-1 MB Nitrate (as N)			<0.020		mg/L		0.02	18-OCT-18

P-T-COL-CL

Water



	Wor	korder: L218228	9 Report Dat	e: 07-MAR-19	Page 2	of 3
Test Mat	rix Refe	rence Result	Qualifier Units	RPD I	Limit Analy	/zed
P-T-COL-CL Wa	ter					
Batch R4289779						
WG2909547-14 LCS						
Phosphorus (P)-Total		105.8	%		80-120 20-O	CT-18
WG2909547-13 MB						
Phosphorus (P)-Total		<0.0050	mg/L		0.005 20-0	CT-18
PO4-DO-COL-CL Wa	ter					
Batch R4288687						
WG2907892-2 LCS						
Orthophosphate-Dissolved (a	s P)	103.5	%		80-120 18-O	CT-18
WG2907892-1 MB						
Orthophosphate-Dissolved (a	s P)	<0.0050	mg/L		0.005 18-O	CT-18
TSS-CL Wa	ter					
Batch R4294912						
WG2908785-2 LCS						
Total Suspended Solids		112.4	%		85-115 19-O	CT-18
WG2908785-1 MB						
Total Suspended Solids		<3.0	mg/L		3 19-0	CT-18

Workorder: L2182289

Report Date: 07-MAR-19

Legend:

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

Sample Parameter Qualifier Definitions:

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

Hold Time Exceedances:

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

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against 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 16, 2018

Final Report

October 29, 2018

Submitted to: ALS Environmental Calgary, AB

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



SAMPLE INFORMATION

Sec. 201		Dates		Bernint
Sample ID/ Internal ID	Collected	Received	Enterococcus test initiation	temperature
L2182289-1 WWTP EFFLUENT - UV TROUGH/	16-Oct-18 at	17-Oct-18 at	17-Oct-18 at	13.4°C
1819-0291-01	123011	123011	133011	
L2182289-2 COLUMBIA RIVER UPSTREAM/	16-Oct-18 at	17-Oct-18 at	17-Oct-18 at	13.2°C
1819-0291-02	1230h	12300	133011	
L2182289-3 COLUMBIA RIVER DOWNSTREAM/	16-Oct-18 at	17-Oct-18 at	17-Oct-18 at	13.1°C
1819-0291-03	125011	125011	155011	
L2182289-4 COLUMBIA	10.0.10.1	17.0.110.1	17 0 4 10 4	
RIVER SIDE CHANNEL/	16-Oct-18 at 1230b	17-Oct-18 at 1230h	17-Oct-18 at 1530h	12.3°C
1819-0291-04	125011	12300	200011	

TEST TYPES

• Enterococcus enumeration test

RESULTS

	MPN/100 mL	
Sample ID	Enterococcus	
L2182289-1 WWTP EFFLUENT – UV TROUGH	<1	
L2182289-2 COLUMBIA RIVER UPSTREAM	1.0	
L2182289-3 COLUMBIA RIVER DOWNSTREAM	2.0	
L2182289-4 COLUMBIA RIVER SIDE CHANNEL	4.1	

MPN = Most Probable Number

QA/QC

04/06	Enterococcus	
QA/QC summary	Linerococcus	
Protocol deviations	See below	
Control performance	Acceptable	
Test performance	Valid	

Samples were received and testing initiated outside of the 24 hour hold time.



The

Destabaret

Report By: Courtney Bogstie, BSc Biologist

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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



APPENDIX A – Test data

V TAL

Quanti-Tray Bench Sheet - Enterococcus

Date: Client PLS ID Reference 18.99-00 Date: 25.00 Reagent used: Enterolert ^{IM} Sample Information Dilution Eactor G Sample Information Dilution Eactor C Comments Dilution Time Comments Dilution Time C	r Temp: 내 (must be 41 ± 0.5°C) CTL - 01 - つン - つろ - OY	vells:	Vells (Tray 2000 only):	Ill Wells (Tray 2000 only): 0<	Incubation Date: Time: Technician:	Temp:(must be 41 ± 0.5°C) Enterococci (Fluorescent) CTL CTL	ive Large Wells:	tive Small Wells (Tray 2000 only):
--	--	--------	-------------------------	--	---------------------------------------	---	------------------	------------------------------------

At 28 hours only score marked ambiguos from 24 hours

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

Nautilus Environmental (Calgary)



APPENDIX B - Chain-of-custody form



CALGARY

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

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

Please see	enclosed	<u>4</u> san	nple(s) in	4	Container(s)		
SAMPLE NUMBER	1819-mai	ANALYT	CAL REQU	IRED		DATE SAMPLED	Priority Flag
L2182289-1	WWTP EFFL	UENT - UV			2018/10/17	10/ 16/ 2018	1-2-0
13.4°C	-01	Enterococ	cus (ENTER	0-HQ 1	Associated Cal	as 10/29/2018	-12302
L2182289-2	COLUMBIA	RIVER			DU CONTRA	10/16/2018 /	フマシ
13.2°C	-02	Enterococ	cus (ENTER	О-HQ 1	No Stries	10/29/2018	A
L2182289-3 DOWNSTRE	COLUMBIA	RIVER"	-		Good condition	on 10/16/2018 12	3~)
13.100	-03	Enterococ	cus (ENTER	O-HQ 1	0	10/29/2018	
L2182289-4	COLUMBIA	RIVER SIDE				10/ 16/ 2018	20
12,3°C/	-04	Enterococ	cus (ENTER	O-HQ 1)		10/29/2018	
Subcontract	Info Contact	:	John For	bes (40)3) 291-9897		
Analysis and	reporting inf	fo contact:	Nancy S 2559 29	onompi STREE	I, B. Sc. T NE		
			CALGAR	Y, AB Т1	Y 7B5		
			Phone:	(403)	291-9897	Email: Nancy.Sonompil@	alsglobal.com
Please ema	il confirmat	ion of recei	pt to:		Nancy.Sonompil	@alsglobal.com	
Shipped By:				1.1	Date Shipped:		
Received By:					Date Received:		
/erified By:			_		Date Verified:		
					Temperature:		
Sample Inter	arity Issues:						



END OF REPORT





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

COC #

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

		_																
Report To		Report Fo	ormat / Distribut	ion		Serv	ice R	eque	sted	Rush	for rou	utine a	nalysi	s subj∉	ect to a	availat	oility)	
Company:	Kicking Horse Mountain Resort Utility Corporation	🔽 Standard	l 🚺 Other			Regular (Standard Turnaround Times - Business Days)												
Contact:	ntact: Travis Jobin 🗌 Digital					O Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT												
Address:	1500 Kicking Horse Trail	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											
Phone:	250-344-8442 Fax:	Email 3:	mskyring@kick	inghorseresort.co	<u>2m</u>			_		A	nalys	sis Re	ques	st				
Invoice To	Same as Report ? 🗌 Yes 🗹 No	Client / P	roject Informatio	on		Please indicate below Filtered, Preserved or both (F, P, F/P)												
Hardcopy of I	Invoice with Report? Yes 7 No	Job #:	Week 3 - 2018	Fall EMS progra	am - WW													
Company:	Resorts of the Canadian Rockies	PO / AFE:	*															1
Contact:	Patrick Majer	LSD:															1	
Address:	1505 - 17th Ave SW Calgary AB																-	lers
Phone:	Fax:	Quote #:						1							1 1			Itair
Lab V	Nork Order #	ALS	A 15			1							ε			ł		ပို
(lat	o use only)	Contact:	1 6 7 V S	Sampler:	I JAANS								olifor	<u>, c</u>	1			j
Sample	Sample Identification		Date	Time		ي ک		Ŧ	8	8	<u> </u>	<u>م</u>	ŭ a	2000	ë :			pe
#	(This description will appear on the report)		(dd-mmm-yy)	(hh:mm)	Sample Type	B0	1SS	N-N	z ż	Ž- Z	Tota	- fi	Fec	ШЧ	о ш	1		NU
	WWTP Effluent - UV trough Temp: 2 pH: 6.8		OCTIB	12 PM	Water	X	X	Х	Х	Х	X	X	Х	X	X			5
	Columbia River Upstream Temp: 4 pH7,8			1230FM	Water		Х	Х	Х	Х	X	X	×	X	X			4
	Columbia River Down stream Temp: 4 pH:7,8				Water		Х	X	Х	Х	X	X	X	X	X			4
	Columbia River Side Channel Temp: 4 pH: 7.8			/	Water		Х	X	Х	X	X	X	X	X	X			4
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<u></u>	Special Instructions / Regulations with water or lan	d use (CCM	ME-Freshwater A	Aquatic Life/BC	CSR - Commerci	al/AB	Tier	1 - Na	itural	, etc)	/ Haz	ardo	us De	ails				
			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·									-			-		
	Failure to complete all	l portions o	of this form may	delay analysis.	Please fill in thi	s forn	n LEC	SIBLY	<i>'</i> .									
	By the use of this form the user ackn	iowledges a	and agrees with	the Terms and	Conditions as pr	ovide	d on	a sep	parate	Exc	el tab).						
ļ	Also provided on another Excel tab are the ALS location	n addresse	s, phone numbe	ers and sample	container / prese	rvatio	on / h	oldin	g tim	e tab	le for	com	non a	analy:	ses.			
Released by	SHIPMENT RELEASE (client use)		IData:	Time:		Var	find h	S	нги				IUN (<u>, iad u:</u>	se on	y)	minte	
rkeleased by	. Date (dd-mmm-yy) Iffte (nn-mm) Received	11m	Later /	y ''アメアと〜	emperature:	ven	nea D	ny.			5.		6 11 18	2.		Yes /	No ?	115.
		vel	$\perp I / I / I$	1197	<u>°C</u>											If Yes	s add	SIF
															GENF	20.00	Front	ι



Microbial Test Results

Samples collected October 16, 2018

Final Report

October 29, 2018

Submitted to: ALS Environmental Calgary, AB

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



SAMPLE INFORMATION

Sec. 201		Bernint		
Sample ID/ Internal ID	Collected	Received	Enterococcus test initiation	temperature
L2182289-1 WWTP EFFLUENT - UV TROUGH/	16-Oct-18 at 17-Oct-18 at 17-Oct-18 at		13.4°C	
1819-0291-01	123011	123011	133011	
L2182289-2 COLUMBIA RIVER UPSTREAM/	16-Oct-18 at	17-Oct-18 at	17-Oct-18 at	13.2°C
1819-0291-02	1230h	12300	133011	
L2182289-3 COLUMBIA RIVER DOWNSTREAM/	16-Oct-18 at	17-Oct-18 at	17-Oct-18 at	13.1°C
1819-0291-03	125011	125011	155011	
L2182289-4 COLUMBIA	10.0.10.1	17.0.110.1	17 0 4 10 4	
RIVER SIDE CHANNEL/	16-Oct-18 at 1230b	17-Oct-18 at 1230h	17-Oct-18 at 1530h	12.3°C
1819-0291-04	125011	12300	200011	

TEST TYPES

• Enterococcus enumeration test

RESULTS

	MPN/100 mL	
Sample ID	Enterococcus	
L2182289-1 WWTP EFFLUENT – UV TROUGH	<1	
L2182289-2 COLUMBIA RIVER UPSTREAM	1.0	
L2182289-3 COLUMBIA RIVER DOWNSTREAM	2.0	
L2182289-4 COLUMBIA RIVER SIDE CHANNEL	4.1	

MPN = Most Probable Number

QA/QC

04/06	Enterococcus	
QA/QC summary	Linerococcus	
Protocol deviations	See below	
Control performance	Acceptable	
Test performance	Valid	

Samples were received and testing initiated outside of the 24 hour hold time.



The

Destabaret

Report By: Courtney Bogstie, BSc Biologist

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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



APPENDIX A – Test data

V TAL

Quanti-Tray Bench Sheet - Enterococcus

Date: Client PLS ID Reference 18.99-00 Date: 25.00 Reagent used: Enterolert ^{IM} Sample Information Dilution Eactor G Sample Information Dilution Eactor C Comments Dilution Time Comments Dilution Time C	r Temp: 내 (must be 41 ± 0.5°C) CTL - 01 - つン - つろ - OY	vells:	Vells (Tray 2000 only):	Ill Wells (Tray 2000 only): 0<	Incubation Date: Time: Technician:	Temp:(must be 41 ± 0.5°C) Enterococci (Fluorescent) CTL CTL	ive Large Wells:	tive Small Wells (Tray 2000 only):
--	--	--------	-------------------------	--	---------------------------------------	---	------------------	------------------------------------

At 28 hours only score marked ambiguos from 24 hours

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

Nautilus Environmental (Calgary)



APPENDIX B - Chain-of-custody form



CALGARY

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

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

Please see	enclosed	<u>4</u> san	nple(s) in	4	Container(s)		
SAMPLE NUMBER	1819-mai	ANALYT	CAL REQU	IRED		DATE SAMPLED	Priority Flag
L2182289-1	WWTP EFFL	UENT - UV		-	2018/10/17	10/ 16/ 2018	1-2-0
13.4°C	-01	Enterococ	cus (ENTER	0-HQ 1	Associated Cal	as 10/29/2018	-12302
L2182289-2	COLUMBIA	RIVER			DU CONTRA	10/16/2018 /	フマシ
13.2°C	-02	Enterococ	cus (ENTER	О-HQ 1	No SNo Z	10/29/2018	A
L2182289-3 DOWNSTRE	COLUMBIA	RIVER"	-		Good condition	on 10/16/2018 12	3~)
13.100	-03	Enterococ	cus (ENTER	O-HQ 1	0	10/29/2018	
L2182289-4	COLUMBIA	RIVER SIDE				10/ 16/ 2018	20
12,3°C/	-04	Enterococ	cus (ENTER	O-HQ 1)		10/29/2018	
Subcontract	Info Contact	:	John For	bes (40)3) 291-9897		
Analysis and	reporting inf	fo contact:	Nancy S 2559 29	onompi STREE	I, B. Sc. T NE		
			CALGAR	Y, AB T1	Y 7B5		
			Phone:	(403)	291-9897	Email: Nancy.Sonompil@	alsglobal.com
Please ema	il confirmat	ion of recei	pt to:		Nancy.Sonompil	@alsglobal.com	
Shipped By:				1.1	Date Shipped:		
Received By:				_	Date Received:		
/erified By:			_		Date Verified:		
					Temperature:		
Sample Inter	arity Issues:						



END OF REPORT



KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received:23-OCT-18Report Date:07-MAR-19 11:02 (MT)Version:FINAL REV. 2

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2185867 Project P.O. #: NOT SUBMITTED Job Reference: WEEK 4 - 2018 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

Environmental 🕽

www.alsglobal.com

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: T.I/CII on 23-OCT-18 @ 10:30							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.095		0.050	mg/L		03-NOV-18	R4316490
Biochemical Oxygen Demand	3.9		2.0	mg/L		25-OCT-18	R4307627
Orthophosphate-Dissolved (as P)	0.343		0.0050	mg/L		24-OCT-18	R4298297
Enterococcus	See Attached			Ū		24-OCT-18	R4327757
Coliform Bacteria - Fecal	<1		1	CFU/100mL		24-OCT-18	R4299454
MPN - E. coli	<1		1	MPN/100mL		24-OCT-18	R4299437
Phosphorus (P)-Total	0.517		0.0050	mg/L		26-OCT-18	R4301338
Total Suspended Solids	7.3		3.0	mg/L		26-OCT-18	R4302089
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	13.9		0.020	mg/L		23-OCT-18	R4295796
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	14.0		0.050	mg/L		24-OC1-18	
Nitrite in Water by IC	0.074		0.010	ma/l		23-OCT-18	R4205706
	0.074		0.010	ing/∟		23-001-10	1(4295790
COLUMBIA RIVER UPSTREAM							
Matrix: WATER Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	ma/l		03-NOV-18	P4216400
Arthonhosphate-Dissolved (as P)	<0.050		0.050	mg/L		24 OCT 18	R4310490
Enterococcus	Soo Attachod		0.0050	ing/∟		24-0CT-18	R4290297
Coliform Bacteria - Fecal	Jee Allacheu		1	CEU/100ml		24-0CT-18	R4327737
	-1		1	MPN/100mL		24-0CT-18	R4299434
Phosphorus (P)-Total	0.0080		0.0050	ma/l		24-001-18	R4299437
Total Suspended Solids	0.0080		0.0050	mg/L		26-0CT-18	R4301330
NO2 NO3 and Sum of NO2/NO3	4.7		5.0	ing/∟		20 001 10	R4302009
Nitrate in Water by IC							
Nitrate (as N)	0.100		0.020	mg/L		23-OCT-18	R4295796
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.100		0.050	mg/L		24-OCT-18	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		23-OCT-18	R4295796
L2185867-3 COLUMBIA RIVER DOWN STREAM							
Sampled By: TJ/CU on 23-OCT-18 @ 11:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		03-NOV-18	R4316490
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		24-OCT-18	R4298297
Enterococcus	See Attached					24-OCT-18	R4327757
Coliform Bacteria - Fecal	1		1	CFU/100mL		24-OCT-18	R4299454
MPN - E. coli	1	OCR	1	MPN/100mL		24-OCT-18	R4299437
Phosphorus (P)-Total	0.0062		0.0050	mg/L		26-OCT-18	R4301338
Total Suspended Solids	<3.0		3.0	mg/L		26-OCT-18	R4302089
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							B /007
INITIATE (AS IN)	0.105		0.020	mg/L		23-OC [-18	R4295796
NITRATE+NITRITE Nitrate and Nitrite (as N)	0 105		0.050	mc/l		24-OCT-19	
	0.103		0.030	ing/L		27 001-10	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	200 201011
Sampled By: T.I/CI on 23-OCT-18 @ 11:00	
Matrix: WATER	
Nitrite in Water by IC	
Nitrite (as N) <0.010 0.010 mg/L 23-00	CT-18 R4295796
L2185867-4 COLUMBIA RIVER SIDE CHANNEL	
Sampled By: TJ/CU on 23-OCT-18 @ 11:00	
Matrix: WATER	
Miscellaneous Parameters	
Ammonia, Total (as N) <0.050 0.050 mg/L 03-NC	DV-18 R4316490
Otthopnosphate-Dissolved (as P) <0.0050	CT 18 R4298297
Coliform Bacteria - Fecal 24-00	CT 18 R4327757
MPN - E coli 1 OCR 1 MPN/100mL 24-00	CT-18 R4299434
Phosphorus (P)-Total 0.0089 0.0050 mg/L 26-0	CT-18 R4301338
Total Suspended Solids <3.0 3.0 mg/L 26 O/	CT-18 R4302089
NO2, NO3 and Sum of NO2/NO3	
Nitrate in Water by IC	
Nitrate (as N) 0.104 0.020 mg/L 23-00	CT-18 R4295796
Nitrate+Nitrite	ΥT 10
Nitrate and Nitrate (as N) 0.104 0.050 111g/L 24-00	51-10
Nitrite (as N) <0.010 0.010 mg/L 23-00	CT-18 R4295796

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier Desc	ription		
OCR Para	meter is out of c	client specific range.	
est Method Refere	nces:		
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 oxygen demand (BOD) dissolved oxygen mete BOD (CBOD) is determ	l out using proce) are determined er. Dissolved BC nined by adding	edures adapted from APHA Method 5210B - "E d by diluting and incubating a sample for a spe DD (SOLUBLE) is determined by filtering the sa a nitrification inhibitor to the diluted sample pri	biochemical Oxygen Demand (BOD)". All forms of biochemical cified time period, and measuring the oxygen depletion using a mple through a glass fibre filter prior to dilution. Carbonaceous or to incubation.
EC-MPN-CL	Water	MPN - E. coli	APHA 9223B
This analysis is carried Substrate Coliform Tes sample is mixed with a The packet is incubate response are counted. probability table. Recommended Holding Sample: 1 day Reference: APHA	l out using proce st". E. coli and T mixture hydroly d for 18 or 24 ho The final result g Time:	edures adapted from APHA Method 9223 "Enz otal Coliform are determined simultaneously. zable substrates and then sealed in a multi-we ours and then the number of wells exhibiting a is obtained by comparing the positive respons	yme The II packet. positive es to a
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is carried Coliform bacteria is en involves an initial 24 ho bacteria (Fecal) and is	l out using proce umerated by cul our incubation a used for non-tu	edures adapted from APHA Method 9222 "Mer Ituring and colony counting. A known sample v t 44.5 degrees C of the filter with the appropria rbid water with a low background bacteria leve	nbrane Filter Technique for Members of the Coliform Group". olume is filtered through a 0.45 micron membrane filter. The test te growth medium. This method is specific for thermotolerant
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried of Chemistry, "Flow-inj al.	l out, on sulfuric ection analysis	acid preserved samples, using procedures mo with fluorescence detection for the determination	odified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society on 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 a	nalyzed by Ion C	Chromatography with conductivity and/or UV de	etection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are a	nalyzed by Ion C	Chromatography with conductivity and/or UV de	etection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried persulphate digestion of	l out using proce of the sample.	edures adapted from APHA Method 4500-P "P	hosphorus". Total Phosphorus is determined colourimetrically after
PO4-DO-COL-CL	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried colourimetrically on a s	l out using proce sample that has	edures adapted from APHA Method 4500-P "P been lab or field filtered through a 0.45 micron	hosphorus". Dissolved Orthophosphate is determined membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is carried (TSS) are determined I	l out using proce by filtering a sar	edures adapted from APHA Method 2540 "Soli nple through a glass fibre filter, and by drying t	ds". Solids are determined gravimetrically. Total suspended solids he filter at 104 deg. C.
* ALS test methods ma	y incorporate m	odifications from specified reference methods	to improve performance.
The last two letters of t	the above test c	ode(s) indicate the laboratory that performed a	nalytical analysis for that test. Refer to the list below:
Laboratory Definition	Code Labo	pratory Location	
CI	ALS	ENVIRONMENTAL - CALGARY ALBERTA (

Chain of Custody Numbers:

Reference Information

L2185867 CONTD.... PAGE 5 of 5 Version: FINAL REV

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



		Quality Control Report						
		Workorder	: L218586	57	Report Date: 07-N	/IAR-19	Pa	ige 1 of 3
Client:	Kicking Horse Mo 1505 - 17th Avenue Calgary Ab T2T Travis Jobin	DUNTAIN UTILITY C E SW 0E2	ORPORATI	ON				
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
	matrix	Kelerence	Result	Quanner	onita		Liiiit	Analyzeu
BOD-BC-CL	Water							
Batch R4	307627							
WG2918386-2 Biochemical Ox	LCS vgen Demand		87.8		%		85-115	25-OCT-18
WG2918386-1	MR		01.0		,.		05-115	23 001 10
Biochemical Ox	ygen Demand		<2.0		mg/L		2	25-OCT-18
EC-MPN-CL	Water							
Batch R4	299437							
WG2914204-1	МВ							
MPN - E. coli			<1		MPN/100mL		1	24-OCT-18
FCC-MF-CL	Water							
Batch R4	299454							
WG2914228-1	MB		-1				4	
Comon Dacier					CI 0/100IIIE		I	24-001-18
NH3-F-CL	Water							
Batch R4	316490							
WG2922301-14	LCS							
Ammonia, Tota	l (as N)		109.3		%		85-115	03-NOV-18
WG2922301-13	MB		0.050		"			
Ammonia, Tota	l (as N)		<0.050		mg/L		0.05	03-NOV-18
NO2-IC-N-CL	Water							
Batch R4	295796							
WG2912738-2 Nitrite (as N)	LCS		104 7		%		00 110	22 OCT 18
WG2012738-6	105		104.1		70		90-110	23-001-18
Nitrite (as N)	200		107.9		%		90-110	23-OCT-18
WG2912738-1	МВ							
Nitrite (as N)			<0.010		mg/L		0.01	23-OCT-18
WG2912738-5	МВ							
Nitrite (as N)			<0.010		mg/L		0.01	23-OCT-18
NO3-IC-N-CL	Water							
Batch R4	295796							
WG2912738-2	LCS		102.0		0/		00 440	
MC2040720 C			103.0		/0		90-110	23-001-18
Nitrate (as N)	LC3		104.1		%		90-110	23-OCT-18
WG2912738-1	МВ						-	-



		Workorder:	L218586	7	Report Date: 07	-MAR-19	Pa	ge 2 of 3
Test Ma	atrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-CL W	ater							
Batch R4295796								
WG2912738-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	23-OCT-18
WG2912738-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	23-OCT-18
P-T-COL-CL W	ater							
Batch R4301338								
WG2915151-2 LCS								
Phosphorus (P)-Total			97.0		%		80-120	26-OCT-18
WG2915151-6 LCS								
Phosphorus (P)-Total			97.3		%		80-120	26-OCT-18
WG2915151-1 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	26-OCT-18
WG2915151-5 MB								
Phosphorus (P)-Total			<0.0050		mg/L		0.005	26-OCT-18
PO4-DO-COL-CL W	ater							
Batch R4298297								
WG2913220-10 LCS								
Orthophosphate-Dissolved ((as P)		104.5		%		80-120	24-OCT-18
WG2913220-14 LCS								
Orthophosphate-Dissolved ((as P)		106.8		%		80-120	24-OCT-18
WG2913220-13 MB								
Orthophosphate-Dissolved ((as P)		<0.0050		mg/L		0.005	24-OCT-18
WG2913220-9 MB								
Orthophosphate-Dissolved ((as P)		<0.0050		mg/L		0.005	24-OCT-18
TSS-CL W	ater							
Batch R4302089								
WG2915321-2 LCS								
Total Suspended Solids			94.2		%		85-115	26-OCT-18
WG2915321-1 MB								
Total Suspended Solids			<3.0		mg/L		3	26-OCT-18

Workorder: L2185867

Report Date: 07-MAR-19

Legend:

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

Sample Parameter Qualifier Definitions:

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

Hold Time Exceedances:

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

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

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against 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 23, 2018

Final Report

November 9, 2018

Submitted to:

ALS Environmental Calgary, AB

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



SAMPLE INFORMATION

		Desisted			
Sample ID/	Collected	Received	Enterococcus test initiation	temperature	
L2185867-1 WWTP EFFLUENT – UV TROUGH/	23-Oct-16 at	24-Oct-18 at	24-Oct-18 at	9.4°C	
1819-0332-01	10300	090011	10180		
L2185867-2 COLUMBIA RIVER UPSTREAM/	23-Oct-18 at	24-Oct-18 at	24-Oct-18 at	10.6°C	
1819-0332-02	11000	090011	101811		
L2185867-3 COLUMBIA RIVER DOWN STREAM/	23-Oct-18 at 1100h	24-Oct-18 at 0900h	24-Oct-18 at 1018h	9.8°C	
1819-0332-03					
L2185867-4 COLUMBIA RIVER SIDE CHANNEL/	23-Oct-18 at	24-Oct-18 at	24-Oct-18 at	10.0°C	
1819-0332-04	11000	030011	101011		

TEST TYPES

Enterococcus enumeration test

RESULTS

1

Microbial test results

	MPN/100 mL	
Sample ID	Enterococcus	
L2185867-1 WWTP EFFLUENT – UV TROUGH	<1	
L2185867-2 COLUMBIA RIVER UPSTREAM	<1	
L2185867-3 COLUMBIA RIVER DOWN STREAM	<1	
L2185867-4 COLUMBIA RIVER SIDE CHANNEL	<1	

MPN = Most Probable Number



QA/QC

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



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Reviewed By:

Report By: Courtney Bogstie, BSc Biologist

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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



APPENDIX A – Test data
G RAUTILUS ENVIRONMENTAL			0	luant	i-Tray	Bencl	Shee'	t - Ent	erococci
					Client	ALS10	2 Refere	nce819	-0332
Test Initiation Date: 2018/10124 Time: 1018 Techician: CB	T T T	Reagent	agent used Lot#/Expiry	t Enterolert	HO I ON	Sa AUNDOVO	nple Informat Dilution-Fa	ton to the total t	
Thermometer Serial #: 160903 41S Incubator #:		Quan	ti Tray 2000	Lot#/Expiry	CAPOI	107-118	1202-		
Results - 24 Hour Incubation Date: 2010125 Tim	TIC	Q	1	Techniciar	B				
Incubator Temp: UL (must be 41 ± 0.5°C)	E	- 6/81	14- 1	123	interococci (F	luorescent)			
# Positive Large Wells:	0	0	0	0	0				
# Ambiguous Large Wells:	01	0	0	0		+			
# TOSILIVE SILIAL VEIIS (Tray 2000 only). # Ambiguous Small Wells (Tray 2000 only):	00	00	20	00	20	T			
Most Probable Number at 24 hours:	L/	T	7	17	7				
Results - 28 Hour Incubation Date:				Techniciar					
Incubator Temp: (must be 41 ± 0.5°C)	៩				Enterococci (F	luorescent)			
# Confirmed Positive Large Wells:									
# Confirmed Positive Small Wells (Tray 2000 only):									
Most Probable Number at 28 hours:									

i b

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

Nautilus Environmental (Calgary)

File: ENT F106



APPENDIX B – Chain-of-custody form



CALGARY

L2185867

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

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

Please see enclosed 4 sam	ple(s) in <u>4</u> Container(s)		
SAMPLE 1810 NUMBER ANALYTI	1-0332 CAL REQUIRED	DATE SAMPLED DUE DATE	Priority Flag
L2185867-1 WWTP EFFLUENT - UV TROUGH Enterococ	CUS (ENTERO-HQ 1) -0/	10/23/2018 1のひ	9.48
L2185867-2 COLUMBIA RIVER UPSTREAM Enterococ	CUS (ENTERO-HQ 1) -02	10/ 23/ 2018 100 11/5/2018	10.62
L2185867-3 COLUMBIA RIVER DOWN STREAM Enterococ	сus (ENTERO-HQ 1) -03	10/23/2018 //00 11/5/2018	9.82
L2185867-4 COLUMBIA RIVER SIDE CHANNEL Enterocod	cus (ENTERO-HQ 1) - 04	10/23/2018 100 11/5/2018	10.0%
Subcontract Info Contact: Analysis and reporting info contact:	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897	018/12/24 9:00 wp off x 350mL bottles (plo 05/NoL Email: Nancy.Sonompil@a	Good condition astic) alsglobal.com
Please email confirmation of rece	ipt to: Nancy.Sonompile	@alsglobal.com	
Shipped By:	Date Shipped:		
Received By:	Date Received:		



END OF REPORT







ain of Custody / Analytical Request Form Canada Toli Free: 1 800 668 9878 www.aisglobal.com

COC #

Page <u>1 of 1</u>

Report To			rmat / Distributi	ion		Serv	ice R	eque	sted (Rush	for rou	utine a	nalysi	s subj	ect to :	availat	oility)	
Company:	Kicking Horse Mountain Resort Utility Corporation	Standard	Cther			🖲 Re	gular (Standa	rd Turr	around	l Times	: - Busi	ness Da	iys)				
Contact:	Travis Jobin		Excel	Digitat	🖌 Fax	() Pri	ority (2	?-4 Bus	iness D	ays) -	50% S	urcharg	je - Cor	itact Al	LS to C	onfirm	TAT	
Address:	1500 Kicking Horse Trail	Email 1:	tjobin@kickingh	orseresort.com			nergeno	<u>су (1-2</u>	Bus. D	ays) - 1	100% 5	Surchar	ge - Co	ntact 4	ALS to (Confirm	TAT	
		Email 2:	pmajer@skircr.@	com		() Sa	me Da	y or We	eekend	Emerg	ency -	Contac	t ALS to) Confi	rm TAT			
Phone:	250-344-8442 Fax:	Email 3:	mskyring@kicki	nghorseresort.co	<u>m</u>					Δ	nalys	sis Re	ques	at 📃				
Invoice To	Same as Report ? 🗌 Yes 🗹 No	Client / Pr	oject Informatic	on		Ple	ase i	ndical	te bel	ow Fil	tered	, Pres	erved	l or br	oth (F	<u>, P, F</u>	/P)	
Hardcopy of Ir	nvoice with Report? Yes 🗹 No	Job #:	Week 4 - 2018	Fall EMS progra	am - WW													
Company:	Resorts of the Canadian Rockies	PO/AFE:											i					
Contact:	Patrick Majer	L\$D:												ļ				
Address:	1505 - 17th Ave SW Calgary AB												1				i	Jer
Phone:	Fax:	Quote #:		<u> </u>														ntai
Lab W	Vork Order # 1 21 3/1/~	ALS	10	Complex	TIME THAT								E					Š
(lab	use only) $L \sim 0546$	Contact:	13	Sampler:	International Lakes	1							륑	- <u>S</u>	1			r of
Sample	Sample Identification		Date	Time		1 8		Ŧ	3	02	al P	β	a o	- S	Ξ			mbe
#	(This description will appear on the report)		(dd-mmm-yy)	(hh:mm)	Sample Type	BÖ	TSS	Z-Ż	Ż	Z-Z	Tot	P ₽ 0	L A	ц Ш	ш		_	Ž
	WWTP Effluent - UV trough Temp: [2, 4 pH: 7, 2		0073	[030AM	Water	X	X	X	X	X	X	X	Х	X	Х			5
	Columbia River Upstream Temp: 3.5 pH: 7,8			ILAM	Water		X	X	X	X	X	X	X	Х	X			4
	Columbia River Down stream Temp: 3,5 pH:7,8		. /		Water		X	Х	X	Х	Х	X	X	X	X			4
	Columbia River Side Channel Temp: 3,5 pH: 7,9		\mathbb{V}		Water		X	x	X	Х	X	x	X	X	X			4
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														'				ł
	Special Instructions / Regulations with water or land	d use (CCM	E-Freshwater A	Aquatic Life/BC	CSR - Commerci	al/AB	Tier	1 - Na	atural	, etc)	/ Haz	ardo	us De	tails	·	_		
		· · · · · ·			······								_					
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	Failure to complete all	portions o	f this form may	delay analysis.	Please fill in this	s forn	n LEO	BLY	' .	F								
	By the use of this form the user ackne	owledges a	ind agrees with	the Terms and	Conditions as pr	ovide	d on m / h	a sep oldin	oarate a tim	e tabl	ei tab Ie for). 	mon	analy				
	SHIPMENT RELEASE (client use)	SHIP	MENT RECEPT	ION (lab use only	N		/11/1	S	HIPM	ENT			TION	(lab u	ise on	ly)		
Released by:	Date (dd-mmm-yy) Time (hh-mm) Received	by:	Date: 1	Time:	Temperature:	Veri	fied b	y:		Date	<u></u>		Time	a:		Obse	rvatio	ons:
		Xton	1/11/12	2550	(11) or	1		-		ļ			1			Yes /	No ?	
L			$\mu \gamma \mu \gamma$	<u> </u>	$\chi \circ \circ$								<u> </u>			It Yes	add	SIF
		-		, y	1										GENF	20.00	1 F tou	



Microbial Test Results

Samples collected October 23, 2018

Final Report

November 9, 2018

Submitted to:

ALS Environmental Calgary, AB

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



SAMPLE INFORMATION

		Dates		Desident
Sample ID/	Collected	Received	Enterococcus test initiation	temperature
L2185867-1 WWTP EFFLUENT – UV TROUGH/	23-Oct-16 at	24-Oct-18 at	24-Oct-18 at	9.4°C
1819-0332-01	10300	090011	10180	
L2185867-2 COLUMBIA RIVER UPSTREAM/	23-Oct-18 at	24-Oct-18 at	24-Oct-18 at	10.6°C
1819-0332-02	11000	090011	101811	
L2185867-3 COLUMBIA RIVER DOWN STREAM/	23-Oct-18 at 1100h	24-Oct-18 at 0900h	24-Oct-18 at 1018h	9.8°C
1819-0332-03				
L2185867-4 COLUMBIA RIVER SIDE CHANNEL/	23-Oct-18 at	24-Oct-18 at	24-Oct-18 at	10.0°C
1819-0332-04	11000	030011	101011	

TEST TYPES

Enterococcus enumeration test

RESULTS

1

Microbial test results

	MPN/100 mL	
Sample ID	Enterococcus	
L2185867-1 WWTP EFFLUENT – UV TROUGH	<1	
L2185867-2 COLUMBIA RIVER UPSTREAM	<1	
L2185867-3 COLUMBIA RIVER DOWN STREAM	<1	
L2185867-4 COLUMBIA RIVER SIDE CHANNEL	<1	

MPN = Most Probable Number



QA/QC

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



Istio

Reviewed By:

Report By: Courtney Bogstie, BSc Biologist

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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



APPENDIX A – Test data

G RAUTILUS ENVIRONMENTAL			0	luant	i-Tray	Bencl	Shee'	t - Ent	erococci
					Client	ALS10	2 Refere	nce819	-0332
Test Initiation Date: 2018/10124 Time: 1018 Techician: CB	T T T	Reagent	agent used Lot#/Expiry	t Enterolert	HO I ON	Sa AUNZO19	nple Informat Dilution-Fa	ton to the total t	
Thermometer Serial #: 160903 41S Incubator #:		Quan	ti Tray 2000	Lot#/Expiry	CAPOI	107-118	1202-		
Results - 24 Hour Incubation Date: 2010125 Tim	TIC	Q	1	Techniciar	B				
Incubator Temp: UL (must be 41 ± 0.5°C)	E	- 6/81	14- 1	123	interococci (F	luorescent)			
# Positive Large Wells:	0	0	0	0	0				
# Ambiguous Large Wells:	01	0	0	0		+			
# TOSILIVE SILIAL VEIIS (Tray 2000 only). # Ambiguous Small Wells (Tray 2000 only):	00	00	20	00	20	T			
Most Probable Number at 24 hours:	L/	T	7	17	7				
Results - 28 Hour Incubation Date:				Techniciar					
Incubator Temp: (must be 41 ± 0.5°C)	៩				Enterococci (F	luorescent)			
# Confirmed Positive Large Wells:									
# Confirmed Positive Small Wells (Tray 2000 only):									
Most Probable Number at 28 hours:									

i b

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

Nautilus Environmental (Calgary)

File: ENT F106



APPENDIX B – Chain-of-custody form



CALGARY

L2185867

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL COMPANY INC. - CALGARY, AB, CANADA

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

Please see enclosed 4 sam	ple(s) in <u>4</u> Container(s)		
SAMPLE 1810 NUMBER ANALYTI	1-0332 CAL REQUIRED	DATE SAMPLED DUE DATE	Priority Flag
L2185867-1 WWTP EFFLUENT - UV TROUGH Enterococ	CUS (ENTERO-HQ 1) -0/	10/23/2018 1のひ	9.48
L2185867-2 COLUMBIA RIVER UPSTREAM Enterococ	CUS (ENTERO-HQ 1) -02	10/ 23/ 2018 100 11/5/2018	10.62
L2185867-3 COLUMBIA RIVER DOWN STREAM Enterococ	сus (ENTERO-HQ 1) -03	10/23/2018 //00 11/5/2018	9.82
L2185867-4 COLUMBIA RIVER SIDE CHANNEL Enterocod	cus (ENTERO-HQ 1) - 04	10/23/2018 100 11/5/2018	10.0%
Subcontract Info Contact: Analysis and reporting info contact:	John Forbes (403) 291-9897 Nancy Sonompil, B. Sc. 2559 29 STREET NE CALGARY,AB T1Y 7B5 Phone: (403) 291-9897	018/12/24 9:00 wp off x 350mL bottles (plo 05/NoL Email: Nancy.Sonompil@a	Good condition astic) alsglobal.com
Please email confirmation of rece	ipt to: Nancy.Sonompile	@alsglobal.com	
Shipped By:	Date Shipped:		
Received By:	Date Received:		



END OF REPORT





KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received: 31-OCT-18 Report Date: 07-MAR-19 11:03 (MT) Version: FINAL REV. 3

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2189622 Project P.O. #: NOT SUBMITTED Job Reference: WEEK 5 - 2018 FALL EMS PROGRAM - WW 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

Environmental 🕽

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Sampled By: T.I/MS on 30-OCT-18 @ 14:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	0.116		0.050	mg/L		04-NOV-18	R4317190
Biochemical Oxygen Demand	2.8		2.0	mg/L		31-OCT-18	R4319368
Orthophosphate-Dissolved (as P)	0.392		0.0050	mg/L		31-OCT-18	R4309871
Enterococcus	See Attached					31-OCT-18	R4331155
Coliform Bacteria - Fecal	<1		1	CFU/100mL		31-OCT-18	R4310707
MPN - E. coli	<1		1	MPN/100mL		31-OCT-18	R4310680
Phosphorus (P)-Total	0.541		0.0050	mg/L		01-NOV-18	R4311809
Total Suspended Solids	7.0		3.0	mg/L		02-NOV-18	R4318567
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC							
Nitrate (as N)	15.2		0.020	mg/L		31-OCT-18	R4310586
Nitrate+Nitrite	15.0		0.050	ma/l		01 NOV 19	
Nitrate and Nitrite (as N)	15.3		0.050	mg/∟		01-NOV-18	
Nitrite (as N)	0.071		0.010	mg/L		31-OCT-18	R4310586
L2189622-2 COLUMBIA RIVER UPSTREAM							
Sampled By: TJ/MS on 30-OCT-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		04-NOV-18	R4317190
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		31-OCT-18	R4309871
Enterococcus	See Attached					31-OCT-18	R4331155
Coliform Bacteria - Fecal	1		1	CFU/100mL		31-OCT-18	R4310707
MPN - E. coli	<1		1	MPN/100mL		31-OCT-18	R4310680
Phosphorus (P)-Total	<0.0050		0.0050	mg/L		01-NOV-18	R4311809
Total Suspended Solids	<3.0		3.0	mg/L		02-NOV-18	R4318567
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC						04 00T 40	D / 0 / 0 D 0
Nitrate (as N)	0.094		0.020	mg/L		31-001-18	R4310586
Nitrate+Nitrite Nitrate and Nitrite (as N)	0.094		0.050	ma/l		01-NOV-18	
Nitrite in Water by IC	0.094		0.000	iiig/ L		01110110	
Nitrite (as N)	<0.010		0.010	mg/L		31-OCT-18	R4310586
L2189622-3 COLUMBIA RIVER DOWNSTREAM				_			
Sampled By: TJ/MS on 30-OCT-18 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		04-NOV-18	R4317190
Orthophosphate-Dissolved (as P)	<0.0050		0.0050	mg/L		31-OCT-18	R4309871
Enterococcus	See Attached					31-OCT-18	R4331155
Coliform Bacteria - Fecal	2		1	CFU/100mL		31-OCT-18	R4310707
MPN - E. coli	2	OCR	1	MPN/100mL		31-OCT-18	R4310680
Phosphorus (P)-Total	0.0110		0.0050	mg/L		01-NOV-18	R4311809
Total Suspended Solids	3.0		3.0	mg/L		02-NOV-18	R4318567
NO2, NO3 and Sum of NO2/NO3							
Nitrate in Water by IC	0.000		0.000			21 007 40	D4240500
Nitrate (as N)	0.098		0.020	mg/L		31-001-18	K4310586
Nitrate and Nitrite (as N)	0 098		0.050	ma/l		01-NOV-18	
	0.000		0.000				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details	/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
1 2189622-3								
Sampled By:	TJ/MS on 30-OCT-18 @ 15:00							
Matrix:	WATER							
Nitrite in Wa	ater by IC							
Nitrite (as N)		<0.010		0.010	mg/L		31-OCT-18	R4310586
L2189622-4	COLUMBIA RIVER SIDE CHANNEL							
Sampled By:	TJ/MS on 30-OCT-18 @ 15:00							
Matrix:	WATER							
Miscellaneo	ous Parameters	0.050		0.050			04 NOV 18	D 4047400
Animonia, To	Dial (as N)	<0.050		0.050	mg/L		04-NOV-18	R4317190
Enterococcu	s	See Attached		0.0050	iiig/L		31-OCT-18	R4309071
Coliform Bac	steria - Fecal	1		1	CFU/100ml		31-0CT-18	R4310707
MPN - E. col	i	1	OCR	1	MPN/100mL		31-OCT-18	R4310680
Phosphorus	(P)-Total	<0.0050		0.0050	mg/L		01-NOV-18	R4311809
Total Susper	nded Solids	<3.0		3.0	mg/L		02-NOV-18	R4318567
NO2, NO3 and	Sum of NO2/NO3							
Nitrate in W	ater by IC			_				
Nitrate (as N)	0.092		0.020	mg/L		31-OCT-18	R4310586
Nitrate+Nitri	lte Jitrite (as N)	0.002		0.050	ma/l		01-NOV-18	
Nitrite in Wa	ater by IC	0.092		0.050	iiig/L		01-100-10	
Nitrite (as N)		<0.010		0.010	mg/L		31-OCT-18	R4310586
					1			

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description		
MS-B	Matrix Spike recovery	could not be accurately calculated due to his	gh analyte background in sample.
OCR	Parameter is out of cl	ient specific range.	
Test Method R	eferences:		
ALS Test Code	Matrix	Test Description	Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand dissolved oxyger BOD (CBOD) is	carried out using proce (BOD) are determined n meter. Dissolved BOI determined by adding a	dures adapted from APHA Method 5210B - " by diluting and incubating a sample for a spe D (SOLUBLE) is determined by filtering the s a nitrification inhibitor to the diluted sample p	Biochemical Oxygen Demand (BOD)". All forms of biochemical ecified time period, and measuring the oxygen depletion using a ample through a glass fibre filter prior to dilution. Carbonaceous rior to incubation.
EC-MPN-CL	Water	MPN - E. coli	APHA 9223B
This analysis is of Substrate Colifor sample is mixed The packet is ind response are con probability table. Recommended H Sample: 1 day Reference: APH.	carried out using proce m Test". E. coli and To with a mixture hydrolyz cubated for 18 or 24 ho unted. The final result i Holding Time:	dures adapted from APHA Method 9223 "En: otal Coliform are determined simultaneously. cable substrates and then sealed in a multi-w urs and then the number of wells exhibiting a s obtained by comparing the positive respons	zyme The rell packet. a positive ses to a
FCC-MF-CL	Water	Fecal Coliform Count-MF	APHA 9222D
This analysis is of Coliform bacteria involves an initia bacteria (Fecal)	carried out using proceed a is enumerated by cult I 24 hour incubation at and is used for non-turl	dures adapted from APHA Method 9222 "Me uring and colony counting. A known sample 44.5 degrees C of the filter with the appropria bid water with a low background bacteria leve	mbrane Filter Technique for Members of the Coliform Group". volume is filtered through a 0.45 micron membrane filter. The test ate growth medium. This method is specific for thermotolerant el.
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is o of Chemistry, "Fl al.	carried out, on sulfuric a ow-injection analysis w	acid preserved samples, using procedures m ith fluorescence detection for the determinat	odified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society ion of trace levels of ammonium in seawater", Roslyn J. Waston et
NO2-IC-N-CL	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with conductivity and/or UV d	letection.
NO3-IC-N-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions	are analyzed by Ion C	hromatography with conductivity and/or UV d	letection.
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is o persulphate dige	carried out using proce stion of the sample.	dures adapted from APHA Method 4500-P "F	Phosphorus". Total Phosphorus is determined colourimetrically after
PO4-DO-COL-CI	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is o colourimetrically	carried out using proce on a sample that has b	dures adapted from APHA Method 4500-P "F been lab or field filtered through a 0.45 micro	Phosphorus". Dissolved Orthophosphate is determined n membrane filter.
TSS-CL	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
This analysis is o (TSS) are detern	carried out using proce nined by filtering a sam	dures adapted from APHA Method 2540 "Sol ple through a glass fibre filter, and by drying	lids". Solids are determined gravimetrically. Total suspended solids the filter at 104 deg. C.
** ALS test metho	ds may incorporate mo	difications from specified reference methods	to improve performance.
The last two lette	ers of the above test co	de(s) indicate the laboratory that performed a	analytical analysis for that test. Refer to the list below:

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

Reference Information

L2189622 CONTD.... PAGE 5 of 5 Version: FINAL REV

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



Quality Control Report

			-,	.,				
		Workorder	: L218962	2	Report Date: 07-	MAR-19	Pa	ge 1 of 3
Client:	KICKING HORSE 1505 - 17th AVEI CALGARY AB T	EMOUNTAIN UTILITY (NUE SW 2T 0E2	CORPORATIO	NC				
Contact:	TRAVIS JOBIN							
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	Water							
Batch R	4319368							
WG2923304-2 Biochemical O	LCS xygen Demand		103.5		%		85-115	31-OCT-18
WG2923304-1 Biochemical O	MB xygen Demand		<2.0		mg/L		2	31-OCT-18
EC-MPN-CL	Water							
Batch R	4310680							
WG2920571-1 MPN - E. coli	МВ		<1		MPN/100mL		1	31-OCT-18
FCC-MF-CL	Water							
Batch R WG2920592-1	4310707 MB							
Coliform Bacte	eria - Fecal		<1		CFU/100mL		1	31-OCT-18
NH3-F-CL	Water							
Batch R	4317190							
WG2922595-14 Ammonia, Tota	I LCS al (as N)		102.3		%		85-115	04-NOV-18
WG2922595-1 3 Ammonia, Tota	B MB al (as N)		<0.050		mg/L		0.05	04-NOV-18
NO2-IC-N-CL	Water							
Batch R	4310586							
WG2920511-2 Nitrite (as N)	LCS		102.1		%		90-110	31-OCT-18
WG2920511-1 Nitrite (as N)	MB		<0.010		mg/L		0.01	31-OCT-18
NO3-IC-N-CL	Water							
Batch R	4310586							
WG2920511-2 Nitrate (as N)	LCS		98.0		%		90-110	31-OCT-18
WG2920511-1 Nitrate (as N)	МВ		<0.020		mg/L		0.02	31-OCT-18
P-T-COL-CL	Water							
Batch R	4311809							
WG2920471-22 Phosphorus (F	2 LCS ?)-Total		101.4		%		80-120	01-NOV-18
WG2920471-21	MB							



Quality Control Report

	Workorder:	L218962	2	Report Date: 0	7-MAR-19	Pa	ge 2 of 3
Test Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-CL Water							
Batch R4311809 WG2920471-21 MB Phosphorus (P)-Total		<0.0050		mg/L		0.005	01-NOV-18
PO4-DO-COL-CL Water							
Batch R4309871 WG2919265-11 DUP Orthophosphate-Dissolved (as P)	L2189622-1 0.392	0.396		mg/L	0.9	20	31-OCT-18
WG2919265-10 LCS Orthophosphate-Dissolved (as P)		102.5		%		80-120	31-OCT-18
WG2919265-9 MB Orthophosphate-Dissolved (as P)		<0.0050		mg/L		0.005	31-OCT-18
WG2919265-12 MS Orthophosphate-Dissolved (as P)	L2189622-1	N/A	MS-B	%		-	31-OCT-18
TSS-CL Water							
Batch R4318567							
WG2921776-2 LCS Total Suspended Solids		98.9		%		85-115	02-NOV-18
WG2921776-1 MB Total Suspended Solids		<3.0		mg/L		3	02-NOV-18

Quality Control Report

Workorder: L2189622

Report Date: 07-MAR-19

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.



Microbial Test Results

Samples collected October 30, 2018

Final Report

November 13, 2018

Submitted to: ALS Environmental Calgary, AB

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



SAMPLE INFORMATION

1		Dessint				
Sample ID/ Internal ID	Collected	Received	Enterococcus test initiation	temperatur		
L2189622-1 WWTP EFFLUENT – UV TROUGH/	30-Oct-18 at	31-Oct-18 at	31-Oct-18 at	4.3°C		
1819-0376-01	140011	11451	124011			
L2189622-2 COLUMBIA RIVER UPSTREAM/	30-Oct-18 at	31-Oct-18 at	31-Oct-18 at	4.4°C		
1819-0376-02	130011	114511	124011			
L2189622-3 COLUMBIA RIVER DOWNSTREAM/	30-Oct-18 at	31-Oct-18 at	31-Oct-18 at	3.9°C		
1819-0376-03	150011	11450	12 1011			
L2189622-4 COLUMIA RIVER SIDE CHANNEL/	30-Oct-18 at	31-Oct-18 at	31-Oct-18 at	4.9°C		
1819-0376-04	13000	114311	124011			

TEST TYPES

Enterococcus enumeration test

RESULTS

Microbial test results

	MPN/100 mL	
Sample ID	Enterococcus	
L2189622-1 WWTP EFFLUENT – UV TROUGH	<1	
L2189622-2 COLUMBIA RIVER UPSTREAM	1.0	
L2189622-3 COLUMBIA RIVER DOWNSTREAM	<1	
L2189622-4 COLUMIA RIVER SIDE CHANNEL	1.0	

MPN = Most Probable Number

QA/QC

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



Toto

Report By: Courtney Bogstie, BSc Biologist

Destalaret

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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



APPENDIX A – Test data

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Quanti-Tray Bench Sheet - Enterococcus

Reagent used: Enterolert ^{tu} Sample Information Reagent used: Enterolert ^{tu} Sample Information Reagent Lot#/Expiny: FPL/D I OU AULA 2014 Comments: Ouanti Tray 2000 Lot#/Expiny: Colop R 17 JUL 201 Comments: ne: DUO Technician: C ne: DUO Technician: C	Test Initiation Date: Dots: Dots:
	Contismont Desitive Laure Malla.
CTL	
Enterococci (Fluorescent)	Incubator Temp: (must be $41 \pm 0.5^{\circ}C$)
he: Technician:	Date: Tim
	sults - 28 Hour Incubation
FI FI 10 FI 10 FI 17 FI	ost Probable Number at 24 hours:
0	Ambiguous Small Wells (Tray 2000 only):
	Decitive Small Wells and and a
	Ambiguous Large Wells:
	Positive Large Wells:
Enterococci (Fluorescent)	Incubator Temp: U (must be 41 ± 0.5°C)
ne: DUO Technician: CB	sults - 24 Hour Incubation Date: 2018/11101 Tim
	cubator Temperature: U (must be 41 ± 0.5°C)
Quanti Tray 2000 Lot#/Expiry: Cn0018 17 JUL 2011	hermometer Serial #: 160903475
Reagent used: Enterolert ^{IM} Sample Information Reagent Lot#/Expiry: FPU/D I ON AND 2019 Comments:	Time: 20/8/10/3/ Time: 20/8/10/3/ Techician: CB

and summer At 28 hours only score marked ambiguos from 24 hours

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

Nautilus Environmental (Calgary)



APPENDIX B – Chain-of-custody form





END OF REPORT





Chain of Custody / Analytical Request Form Canada Toll Free: 1 800 668 9878 . <u>www.aisqlobal.com</u> COC #

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

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Columbia River Upstream Temp: pH: Structure X		WWTP Effluent - UV trough Temp: Dr pH: 7.	2	OCT30	2.PM	Water	X	X	X	X	X	X	X	X	X	X		5
Columbia River Down stream Temp: pH: Water X	· · · · · · · · · · · · · · · · · · ·	Columbia River Upstream Temp: 🖉 pH: 7.	.8	1	SPM	Water		X	X	X	X	X	X	. X	X	X		4
Columbia River Side Channel Temp: pH: Water X		Columbia River Down stream Temp: pH:				Water		X	X	X	X	X	X	X	X	X		4
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab. Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses. SHIPMENT.RELEASE (client use) SHIPMENT.RELEASE (client use) SHIPMENT RECEPTION (lab use ohly) SHIPMENT VERIFICATION (lab use only) Released by: Date (usennm-yr) Time (th-mm) Time: Time: Verified by: Date: Time: Verified by: OEBE TOID Stead		Columbia River Side Channel Temp: pH:	<u> </u>			Water		X	X	X	X	X	X	X	X	X		4
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Microbial Test Results

Samples collected October 30, 2018

Final Report

November 13, 2018

Submitted to: ALS Environmental Calgary, AB

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



SAMPLE INFORMATION

1		Dessint				
Sample ID/ Internal ID	Collected	Received	Enterococcus test initiation	temperatur		
L2189622-1 WWTP EFFLUENT – UV TROUGH/	30-Oct-18 at	31-Oct-18 at	31-Oct-18 at	4.3°C		
1819-0376-01	140011	11451	124011			
L2189622-2 COLUMBIA RIVER UPSTREAM/	30-Oct-18 at	31-Oct-18 at	31-Oct-18 at	4.4°C		
1819-0376-02	130011	114511	124011			
L2189622-3 COLUMBIA RIVER DOWNSTREAM/	30-Oct-18 at	31-Oct-18 at	31-Oct-18 at	3.9°C		
1819-0376-03	150011	11450	12 1011			
L2189622-4 COLUMIA RIVER SIDE CHANNEL/	30-Oct-18 at	31-Oct-18 at	31-Oct-18 at	4.9°C		
1819-0376-04	13000	114311	124011			

TEST TYPES

Enterococcus enumeration test

RESULTS

Microbial test results

Sample ID	MPN/100 mL	
	Enterococcus	
L2189622-1 WWTP EFFLUENT – UV TROUGH	<1	
L2189622-2 COLUMBIA RIVER UPSTREAM	1.0	
L2189622-3 COLUMBIA RIVER DOWNSTREAM	<1	
L2189622-4 COLUMIA RIVER SIDE CHANNEL	1.0	

MPN = Most Probable Number

QA/QC

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



Toto

Report By: Courtney Bogstie, BSc Biologist

Destalaret

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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

REFERENCES

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

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


APPENDIX A – Test data

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Quanti-Tray Bench Sheet - Enterococcus

Reagent used: Enterolert ^{tu} Sample Information Reagent used: Enterolert ^{tu} Sample Information Reagent Lot#/Expiny: FPL/D I OU AULA 2014 Comments: Ouanti Tray 2000 Lot#/Expiny: Colop R 17 JUL 201 Comments: ne: DUO Technician: C ne: DUO Technician: C	Test Initiation Date: Dots: Dots:
	Contismont Desitive Laure Malla.
CTL	
Enterococci (Fluorescent)	Incubator Temp: (must be $41 \pm 0.5^{\circ}C$)
he: Technician:	Date: Tim
	sults - 28 Hour Incubation
FI FI 10 FI 10 FI 17 FI	ost Probable Number at 24 hours:
0	Ambiguous Small Wells (Tray 2000 only):
	Decitive Small Wells and and a
	Ambiguous Large Wells:
	Positive Large Wells:
Enterococci (Fluorescent)	Incubator Temp: U (must be 41 ± 0.5°C)
ne: DUO Technician: CB	sults - 24 Hour Incubation Date: 2018/11101 Tim
	cubator Temperature: U (must be 41 ± 0.5°C)
Quanti Tray 2000 Lot#/Expiry: Cn0018 17 JUL 2011	hermometer Serial #: 160903475
Reagent used: Enterolert ^{IM} Sample Information Reagent Lot#/Expiry: FPU/D I ON AND 2019 Comments:	Time: 20/8/10/3/ Time: 20/8/10/3/ Techician: CB

and summer At 28 hours only score marked ambiguos from 24 hours

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

Nautilus Environmental (Calgary)



APPENDIX B – Chain-of-custody form





END OF REPORT



KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received:30-NOV-18Report Date:06-DEC-18 15:44 (MT)Version:FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2204367 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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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2204367-1 UV TROUGH Sampled By: TJ on 30-NOV-18 @ 10:00 Matrix: WATER Miscellaneous Parameters Biochemical Oxygen Demand Orthophosphate-Dissolved (as P)	<2.0 0.694		2.0 0.0050	mg/L mg/L		30-NOV-18 01-DEC-18	R4379047 R4367174
Coliform Bacteria - Fecal	<1		1	CFU/100mL		01-DEC-18	R4367816
Phosphorus (P)-Total	0.605		0.0050	mg/L		05-DEC-18	R4376047
Total Suspended Solids	11.0		3.0	mg/L		03-DEC-18	R4371951

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

Reference Information

Qualifiers for Individual Samples Listed:

Sample Numbe	Client ID	Qualifier	Description	
L2204367-1	UV TROUGH	SP	Sample was Preserve	d at the laboratory
Test Method Re	eferences:			
ALS Test Code	Matrix	Test Description		Method Reference**
BOD-BC-CL	Water	Biochemical Oxygen I	Demand (BOD)	APHA 5210 B-5 day IncubO2 electrode
This analysis is o oxygen demand dissolved oxygen BOD (CBOD) is o	arried out using pro (BOD) are determine meter. Dissolved B determined by addin	cedures adapted from API ed by diluting and incubatin OD (SOLUBLE) is determ g a nitrification inhibitor to	HA Method 5210B - "Bio ng a sample for a specifi ined by filtering the sam the diluted sample prior	chemical Oxygen Demand (BOD)". All forms of biochemical ed time period, and measuring the oxygen depletion using a ple through a glass fibre filter prior to dilution. Carbonaceous to incubation.
FCC-MF-CL	Water	Fecal Coliform Count-	MF	APHA 9222D
This analysis is of Coliform bacteria involves an initial bacteria (Fecal) a	arried out using pro is enumerated by c 24 hour incubation and is used for non-1	cedures adapted from API ulturing and colony counti at 44.5 degrees C of the fi urbid water with a low bac	HA Method 9222 "Memb ng. A known sample volu ilter with the appropriate kground bacteria level.	rane Filter Technique for Members of the Coliform Group". ume is filtered through a 0.45 micron membrane filter. The test growth medium. This method is specific for thermotolerant
P-T-COL-CL	Water	Total P in Water by C	olour	APHA 4500-P PHOSPHORUS
This analysis is opersulphate dige	arried out using pro stion of the sample.	cedures adapted from API	HA Method 4500-P "Pho	sphorus". Total Phosphorus is determined colourimetrically afte
PO4-DO-COL-CL	Water	Diss. Orthophosphate	in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is c colourimetrically	arried out using pro on a sample that ha	cedures adapted from API s been lab or field filtered	HA Method 4500-P "Pho through a 0.45 micron m	sphorus". Dissolved Orthophosphate is determined embrane filter.
TSS-CL	Water	Total Suspended Soli	ds	APHA 2540 D-Gravimetric
This analysis is o (TSS) are determ	arried out using pro nined by filtering a se	cedures adapted from API ample through a glass fibro	HA Method 2540 "Solids e filter, and by drying the	". Solids are determined gravimetrically. Total suspended solids filter at 104 deg. C.
** ALS test metho	ds may incorporate	modifications from specifie	ed reference methods to	improve performance.
The last two lette	rs of the above test	code(s) indicate the labora	atory that performed ana	lytical analysis for that test. Refer to the list below:
Laboratory Defin	nition Code La	ooratory Location		
CL	AL	S ENVIRONMENTAL - CA	LGARY, ALBERTA, CAI	NADA

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.



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			Quality	/ Contr	ol Report			
		Workorder:	L2204367		Report Date: 06-I	DEC-18	Pa	ge 1 of 2
Client: K 1 Contact: T	(ICKING HORSE MOUI 505 - 17th Avenue S Calgary Ab T2T 0e2 RAVIS JOBIN	NTAIN UTILITY C 3W 2	ORPORATION	N				
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	Water							
Batch R4 WG2948185-2 Biochemical Ox	379047 LCS ygen Demand		95.9		%		85-115	30-NOV-18
WG2948185-1 Biochemical Ox	MB ygen Demand		<2.0		mg/L		2	30-NOV-18
FCC-MF-CL	Water							
Batch R4 WG2944826-1 Coliform Bacteri	367816 MB ia - Fecal		<1		CFU/100mL		1	01-DEC-18
P-T-COL-CL	Water							
Batch R4 WG2946912-6 Phosphorus (P)	376047 LCS -Total		106.9		%		80-120	05-DEC-18
WG2946912-5 Phosphorus (P)	MB -Total		<0.0050		mg/L		0.005	05-DEC-18
PO4-DO-COL-CL	Water							
Batch R4	367174							
WG2944227-2 Orthophosphate	LCS -Dissolved (as P)		103.9		%		80-120	01-DEC-18
WG2944227-1 Orthophosphate	MB -Dissolved (as P)		<0.0050		mg/L		0.005	01-DEC-18
TSS-CL	Water							
Batch R4 WG2944959-8 Total Suspende	371951 LCS d Solids		113.1		%		85-115	03-DEC-18
WG2944959-7 Total Suspende	MB d Solids		<3.0		mg/L		3	03-DEC-18

Workorder: L2204367

Report Date: 06-DEC-18

Legend:

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

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 <u>www.alsglobal.com</u>

COC#

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Company:	Resorts of the Canadian Rockies					-											
Contact:	Patrick Majer	L\$D:				-								·			_ ул
Address:	1505 - 17th Ave SW Calgary AB					_	1							1			iner
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Sample #	Sample Identification (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	TSS	Fecat (Ortho F	Total P							Numb
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				_													
	Failure to complete	all portions of	of this form may	delay analysis.	Please fill in thi	s forn	n LEC	SIBLY									
	By the use of this form the user a	cknowledges	and agrees with	the Terms and	Conditions as p	rovide	ed on	a sep	arate	е Ехс	el tab	ь.					
	Also provided on another Excel tab are the ALS loca	tion addresse	s, phone numbe	ers and sample	container / prese	ervatio	on / h	oldin	g tim	e tab	le for	r comi	non a	inalys	es.		. <u></u>
	SHIPMENT RELEASE (client use)	SHIF	MENT RECEPT	ION (lab use only	/)			SI	IIPM	ENT	VERI	FICAT	ION (lab us	e onl	y)	
Released by	/: Date (dd-mmm-yy) Time (hh-mm) Receiv	ved by:	Date:	Time: 3!30	Temperature:	Veri	ified b	oy:		Dat	e:		Time) :		Observ Yes / N If Yes #	ations: o ? idd SIF

GENF 20.00 Front



KICKING HORSE MOUNTAIN UTILITY CORPORATION ATTN: TRAVIS JOBIN 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 Date Received: 27-DEC-18 Report Date: 07-JAN-19 10:32 (MT) Version: FINAL

Client Phone: 250-344-6003

Certificate of Analysis

Lab Work Order #: L2214673 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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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2214073-1 EFFLUENT Sampled By: T L on 27-DEC-18 @ 09:10							
Motrix: WATER							
Maurix. WATER Miscellaneous Parameters							
Biochemical Oxygen Demand	22.9	DLHC	6.0	ma/l		28-DFC-18	R4425752
Orthophosphate-Dissolved (as P)	1.89		0.0050	mg/L		29-DEC-18	R4418962
Coliform Bacteria - Fecal	102000	DLA	1000	CFU/100mL		28-DEC-18	R4419159
Phosphorus (P)-Total	119		0.0050	ma/L		04-JAN-19	R4429279
Total Suspended Solids	21.7		3.0	ma/L		28-DEC-18	R4420569
1 2214673-2 INFLUENT			0.0				
Sampled By: T.I on 27-DEC-18 @ 09:15							
Matrix: WATER							
Miscellaneous Parameters							
Biochemical Oxygen Demand	385	DLHC	75	mg/L		28-DEC-18	R4425752
Total Suspended Solids	425	DLHC	15	mg/L		28-DEC-18	R4420569
				-			

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

Reference Information

Sample Parameter Qualifier Key:

Description

Our lifting

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

Test Method References: ALS Test Code Matrix Method Reference** **Test Description** BOD-BC-CL 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 Fecal Coliform Count-MF APHA 9222D Water This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation at 44.5 degrees C of the filter with the appropriate growth medium. This method is specific for thermotolerant bacteria (Fecal) and is used for non-turbid water with a low background bacteria level. **APHA 4500-P PHOSPHORUS** P-T-COL-CL Water Total P in Water by Colour 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-CI Water **Total Suspended Solids** APHA 2540 D-Gravimetric

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

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

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

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

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

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

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

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

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

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

< - Less than.

D.L. - The reporting limit.

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

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



Quality Control Report

			•	,				
		Workorder:	L2214673	3	Report Date: 07-	JAN-19	Pa	ge 1 of 2
Client:	KICKING HORSE MOUNT 1505 - 17th AVENUE SW CALGARY AB T2T 0E2 FRAVIS JOBIN	AIN UTILITY CO	ORPORATIO	N				
	Matala	D - (Descrit	0	11 11		1.1	A
lest	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-BC-CL	Water							
Batch R4 WG2963722-2 Biochemical Ox	4 25752 LCS sygen Demand		110.2		%		85-115	28-DEC-18
WG2963722-1 Biochemical Ox	MB sygen Demand		<2.0		mg/L		2	28-DEC-18
FCC-MF-CL	Water							
Batch R4 WG2961992-1 Coliform Bacter	419159 MB ria - Fecal		<1		CFU/100mL		1	28-DEC-18
P-T-COL-CL	Water							
Batch R4 WG2964474-2 Phosphorus (P)	1429279 LCS)-Total		107.3		%		80-120	04-JAN-19
WG2964474-1 Phosphorus (P)	MB -Total		<0.0050		mg/L		0.005	04-JAN-19
PO4-DO-COL-CL	Water							
Batch R4 WG2961867-6 Orthophosphate	4 18962 LCS ∋-Dissolved (as P)		93.0		%		80-120	29-DEC-18
WG2961867-5 Orthophosphate	MB e-Dissolved (as P)		<0.0050		mg/L		0.005	28-DEC-18
TSS-CL	Water							
Batch R4 WG2961374-2 Total Suspende	4 20569 LCS ed Solids		98.9		%		85-115	28-DEC-18
WG2961374-1 Total Suspende	MB ed Solids		<3.0		mg/L		3	28-DEC-18

Quality Control Report

Workorder: L2214673

Report Date: 07-JAN-19

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.

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

S) Environmental

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COC#

Page <u>1</u> of ____1

Report To		Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)											
Company:	Kicking Horse Mountain Water Utility Co. Ltd.	Standard Other				Regular (Standard Turnaround Times - Business Days)											
Contact:	Travis Jobin	PDF Excel Digital Fax					O Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT										
Address:	1500 Kicking Horse Trail	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											
Phone:	250-344-8442 Fax:	Email 3: mskyring@kickinghorseresort.com				Analysis Request											
Invoice To Same as Report ? Ses Vo			Client / Project Information				Please indicate below Filtered, Preserved or both (F, P, F/P)										
Hardcopy of Ir	nvoice with Report? 🗌 Yes 🗔 No	Job #: RCR - Kicking Horse Mountain Resort															
Company:	Resorts of the Canadian Rockies	PO / AFE:															
Contact:	Patrick Majer	LSD:															
Address: 1505 - 17th Ave SW Calgary AB														ļ		lers	
Phone:	Fax:	Quote #: Q33059														Itair	
Lab Work Order #			ALS 10 DOLLAR					E	hate							ပိ	
(lab	use only)	Contact:	LŞ	Sampler:				olifo	dsou							٦ م	
Sample	Sample Identification		Date	Time	Commit Time	1		й ы	6 12	d I						be de	
#	(This description will appear on the report)		(dd-mmm-yy)	(hh:mm)	Sample Type	BOI	12S	Бе С	통	Tot						N N	
	Efflueht		27-Dec-18	910AM	Water	X	X	Х	X	Х						3	
	Influent		27-Dec-18	915AM	water	X	X									2	
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	Special Instructions / Regulations with water or lar	id use (CCM	IE-Freshwater A	quatic Life/BC	CSR - Commerci	al/AB	Tier 1	- Na	tural,	etc)	/ Hazar	dous D	etails				
Pailure 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 arreas with the Terms and Conditions as provided on a separate Excel term.																	
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.																	
SHIPMENT RELEASE (client use) SHIPMENT RECEPTION (lab use only) SHIPMENT VERIFICATION (lab use only)																	
Released by:	Date (dd-mmm-yy) Time (hh-mm) Received	by: 🏠	Date:	Time:	Temperature:	Veri	fied by	/:		Date		Tin	ne:	0	bservatio	ons:	
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CERTIFICATE OF INSURANCE										
BROKER Toole Peet & Co. Limited P.O. Box 4650 Station C 1135 - 17 th Avenue SW Calgary, AB T2T 5R5		This certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policies below.								
BROKER'S CLIENT ID:			COMPANIES AFFORDING COVERAGE							
INSURED'S FULL NAME AND MAILIN	IG AD	DRESS	COMPANY A		s under contract MKL2019001					
			COMPANY B	Economical Ir	isurance					
Environmental Diagnostic Inc.	s In	c. and Sabau Holdings	COMPANY C							
#140, 5050 - 106 Ave. SE Calgary, AB T2C 5E9			COMPANY D							
		cov	ERAGES							
This is to certify that the policies of insurar contract or other document with respect t	nce liste o which	ed below have been issued to the insured nam this certificate may be issued or may pertain conditions	ned above for the po . The insurance afford of such policies.	blicy period indicated, notwiths orded by the policies describe	standing any requirement, term or condition of any d herein is subject to all the terms, exclusions and					
LIMITS SHOWN MAY HAVE			POLICY EFFECTI DATE (MM/DD/)	BY PAID CLAIMS EVE POLICY EXPIRATION YY) DATE (MM/DD/YY)	LIMITS OF LIABILITY					
	LIK				EACH OCCURRENCE -BODILY INJURY,					
COMMERCIAL GENERAL LIABILITY	A	BINDER	3/30/2019	3/30/2020	PROPERTY DAMAGE, PERSONAL INJURY \$ 2,000,000 GENERAL AGGREGATE \$ 2,000,000					
PRODUCTS AND / OR COMPLETED OPERATIONS EMPLOYERS' LIABILITY CROSS LIABILITY					PRODUCTS - Comp/Ops Agg. \$ Included TENANT'S LEGAL LIABILITY \$ 500,000					
V TENANT'S LIABILITY NON-OWNED AUTOMOBILES V HIRED					MED EXP (any one person) \$ 2,500 NON-OWNED AUTO \$ 2,000,000					
CONTRACTUAL LIABILITY					\$					
DESCRIBED AUTOMOBILES ALL OWNED AUTOMOBILES LEASED AUTOMOBILES		9/18/2018	9/18/2019	BODILY INJURY PROPERTY DAMAGE COMBINED \$ 2,000,000 BODILY INJURY (Per Person) BODILY INJURY (Per Accident) PROPERTY DAMAGE \$						
**ALL AUTOMOBILES LEASED IN EXCESS OF 30 DAYS WHERE THE INSURED IS REQUIRED TO PROVIDE INSURANCE										
EXCESS LIABILITY UMBRELLA FORM OTHER THAN UMBRELLA FORM (Specify)					\$ \$					
OTHER LIABILITY (SPECIFY)					\$					
ENVIRONMENTAL CONSULTING PROFESSIONAL (ERRORS AND OMISSIONS) LIABILITY-CLAIMS MADE COVERAGE	A	BINDER	4/20/2019	4/20/2020	LIMIT ANY ONE CLAIM/POLICY AGGREGATE \$ 3,000,000					
ENVIRONMENTAL IMPAIRMENT LIABILITY (Claims Made)	A	BINDER	3/30/2019	3/30/2020	EACH CLAIM \$ 1,000,000					
					PERIOD (OFF SITE THIRD PARTY) \$ 1,000,000					
ADDITIONAL INSURED			DES	CRIPTION OF OPERATIO	NS, LOCATIONS/ AUTOMOBILES/ SPECIAL					
			Envi Asse Plan Inc.:	ronmental Diagnostics: Envi ssment, Risk Management P s, Soil and Groundwater Ren : Holding Company	ronmental Site lans, Remedial Action nediation. Sabau Holdings					
CERTIFICATE HOLDER	1		CAN	ICELLATION						
To Whom It May Concern				Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will endeavor to mail \underline{O} days written notice to the certificate holder named to the left, but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or						
SIGNATURE OF AUTHORIZED REPRESENT)	FAX (40)	NUMBER 3) 228-0231	EMAIL ADDRESS eshea@toolepeet.com					
PRINT NAME INCLUDING POSITION HELD Erica Shea, Account Mana	ger		CON Too	IPANY Ie Peet & Co. Limited	DATE April 16, 2019					