

CITY OF ROSSLAND

Annual Water Report - 2010

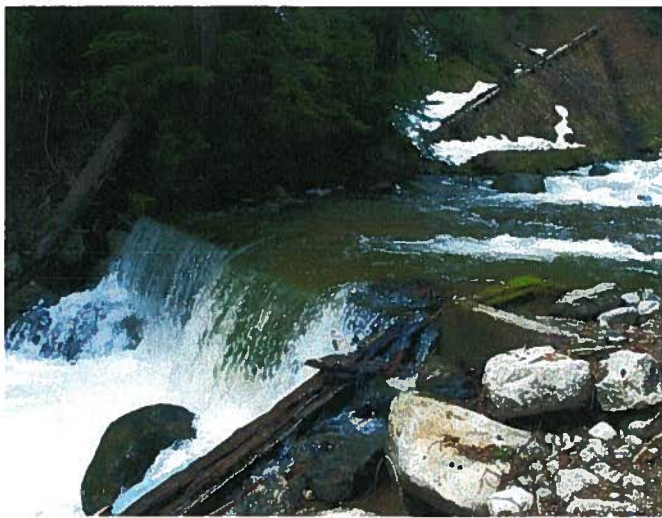


Introduction

The City of Rossland provides drinking water to users connected to the Rossland Water System. This report is provided to City Council for their information, and in fulfillment of the City's obligations under the Provincial Drinking Water Act and associated regulations, as well as the terms and conditions of the City's Water System Operating Permit. Enforcement of the regulations and issuance of water system permits is the responsibility of the Interior Health Authority's Drinking Water Officer.

Raw Water

The City's raw water source is entirely surface water in three alpine creek catchments: Topping Creek, Hanna Creek and Murphy Creek, with intakes adjacent to Highway 3B between Red Mountain and Nancy Greene Summit, ranging in elevation from 1200m to 1550m above sea level. A map of the intake locations is provided in Appendix A.



Hanna Creek Raw Water Intake

The City sampled and undertook complete testing for the one raw water sources in 2010, the results of these tests are provided in Appendix B.

Raw water is collected at Hanna and Murphy Creek intakes and transmitted by pipeline ranging in size from 150mm to 250mm to Ophir Reservoir which has a capacity of approximately 165,000 cubic meters. Ophir Reservoir water is piped to Star Gulch Reservoir along with raw water from Topping Creek intake to fill approximately 120,000 cubic meters. During the Spring Freshet, all three creeks, and the reservoir, overflow water for many months as supply exceeds consumption.

The City of Rossland inspects intakes, pipes and areas immediately around the intakes on a monthly basis in summer, while winter and spring access limits inspections to a couple of times by snowshoe or snowmobile. Much of the watershed is used for recreation, with skiing, mountain biking, horse riding and hiking activities common. The City has erected signage near facilities and along hiking trails indicating that the area is part of the City's watershed.

Hydrant Flushing

The City flushes all fire hydrants annually as a health requirement during the month of May to help maintain water quality with our aging infrastructure. In the fall the City will flush specific hydrants around town where there is minimal flows.

Valve Replacement

The City has an ongoing program to replace aging valves in the water distribution system for better control of directional flushing as well as less disruption when a water repair is required.



Treated Water

Immediately south of the Star Gulch Reservoir is the City's Water Treatment Plant located adjacent to Highway 3B. This facility was built approximately 15 years ago and comprises of three main buildings – two slow sand filter buildings and one control and pumping building. There are six slow sand filter bays drawing water directly from Star Gulch Reservoir. These bays are monitored daily and periodic maintenance includes the removal of build up on the surface of the Smutzdecke (active biological layer). Water passes through the filter bays and is then chlorinated using chlorine gas before being stored in the clearwater tank prior to distribution to the City.

Disinfection equipment is capable of providing sufficient dosage to the water at both high and low flow periods to ensure an appropriate, and compliant, level of residual disinfection capability throughout the distribution system. The dual control chlorinators can provide 0-9 kg per day during low water flow periods and 0-22 kg per day during high demand.

The chlorine disinfection system is maintained by City staff trained to operate the system and who provide scheduled maintenance/overhaul services, as well as do



Downtown Rossland

repair work as required. A stock of extra parts and equipment, as well as quick-connect plumbing and electrical connections ensure complete redundancy of the system at all times, to minimize the chance of extended breakdowns.

Distribution System

The City's distribution system is comprised of a variety of pipe materials, from ductile iron cement lined, mild steel, asbestos cement, copper, PVC and Polyethylene. Replacement of older pipe materials is a slow process, and as opportunities arise through subdivision, building permits, paving work or detected leaks, the City is replacing pipes and service connections.

The City, due to the range of elevations throughout the system, has five pressure zones, these are described below.

Red Mountain Zone

This zone is pumped from the treatment plant up to a concrete reservoir on Granite Mountain above the development in the base area of Red Mountain. A single pipeline in and out of the Granite reservoir proves to be an operational challenge for maintaining high quality water with low occupancy and slower development contributing to lower consumption rates in the base area. This storage also provides backup supply for the remainder of the City in the event of a power failure or other issues with the treatment plant.

Upper Rossland Zone

The Upper Rossland Zone is fed by gravity from the Treatment Plant. This zone essentially services properties at elevations at and above the downtown core.



Kirkup Zone

The Kirkup zone is supplied from a small pump station at the intersection of Kirkup Ave and Plewman Way which is in the Upper Rossland Zone. Water is pumped to a bolted steel reservoir located on Mount Kirkup and feeds residential properties that are located above the minimum pressure zone provided by gravity from the treatment plant.

Lower Rossland Zone

Two Pressure Reducing Valve (PRV) stations separate the upper and lower Rossland Zones. These are located outside City Hall on Columbia Avenue, and on Park Street above the Pinewood subdivision. This zone encounters operational challenges with older infrastructure and low flows in some sections.

Redstone Zone

With the completion of the first phase of the Redstone subdivision, residential water services were provided to this area. A PRV station along Esling Drive reduces the pressure from over 230 psi to around 20 psi to ensure that pressures within the subdivision do not exceed 150 psi.

Star Gulch Reservoir



Water Sampling and Testing Program

Drinking water delivered to users of the City system is subject to a comprehensive and rigorous testing program that ensures quality drinking water. Continuous monitoring of free chlorine residual readings, temperature and pH in the drinking water is accomplished with Hach meters located in the Water Treatment plant (disinfection takes place here). On a daily basis City staff test samples of drinking water from the plant. On a weekly basis City Staff test separate locations for free chlorine residuals (i.e. the presence of chlorine in the water). These tests are conducted with hand-held Hach meters that measure the minute amounts of disinfectant that must be in the drinking water throughout the system to meet regulations. Sample points are located at the start, middle and end of the entire City water distribution system to ensure the effectiveness of the disinfection program. At least 0.2 milligrams of chlorine must be present in every litre of water to meet these standards.

Over six hundred manual chlorine residual tests were conducted by City staff in 2010 at the 5 locations. The lowest residual reading in the distribution system was 1.00 mg/l and the highest reading was 1.53 mg/l. Whenever staff determine that the readings may be trending too low they slightly increase the dosage of disinfectant at the Water Treatment Centre and confirm the results during the next day's tests indicating residual levels have increased.

Water samples are sent, on a weekly basis, to the Caro Environmental Services laboratories to be tested for the presence/absence e-coli and total coliform bacteria. City staff draws these samples and sends them to the Kelowna laboratory. Results are returned to the City within a week.



The standard protocol when a water sample is found to contain the presence of coliforms, however minute, is to resample the water immediately at the same location and resubmit for testing. The provincial Drinking Water Officer will determine if any action by the purveyor is necessary only after a second test also shows the presence of coliforms.

In 2010 the City submitted approximately 130 samples for ecoli and coliform testing and none came back positive for either ecoli or coliforms.

Turbidity is monitored continuously after filtration with the highest reading at 0.18 and the lowest reading of 0.08 during 2010.

See Appendix B & C for test results.

Records

The City uses SCADA (System Control and Data Acquisition) to continuously monitor water quality, flow, pressure and storage. This system assists City staff to maintain a safe drinking water supply by advising when dosage or residual disinfectant levels are outside of set parameters (either high or low) for the system. The SCADA system will alert staff by cell phone or computer message to ensure that corrections can be made before water quality can be adversely affected.

This data is stored at the Water Treatment plant. This data is forwarded on a monthly basis and is used to provide information to the provincial Drinking Water Officer, including the completion of this annual report.

Flow records are taken daily to determine the volume of treated water being produced and distributed. Future upgrades of this system would include the installation of further flow meters for raw water and treated water at key points in the distribution system.

Water Consumption

Water consumption in 2010 was less than in previous years. The total water consumption was 860,148 cubic meters as compared to 914,992 cubic meters in 2009. This can be attributed the increase of water meters installed and increasing awareness of the importance of water conservation within the community.

Consumption at Red Mountain is able to be measured separately as all of the water for this zone is pumped and passes through a flow meter. Typically, the consumption at Red Mountain is lower per unit than in the rest of the City, this is a function of less irrigated landscaping per lot, and lower occupancy levels in the summer.

Minimum daily demands are fairly constant in town throughout the year, ranging between 1,400 to 2,100 cubic meters per day. Maximum day demands occur during summer (June-September) and range approximately from 1,800 to 4,800 cubic meters for irrigation periods.

New Connections

In 2010, the City received 11 building applications for new dwellings which is up from 8 in 2009.

Planning for Topping Creek Intake Upgrades in 2011

The City applied for a grant to assist in funding the upgrade of the Topping Creek Raw Water intake. This project has been a high priority for the City for many years and funding confirmation was received in 2009, with construction to commence in 2011.



Water System Projects

Ophir Reservoir

Construction of the dam was completed in Fall 2008 and was filled by spring of 2009. This dam is designed to hold approximately 165,000 cubic meters of water diverted from Murphy and Hanna Creeks. Filling stopped prior to the winter to ensure that monitoring of the dam could be undertaken before filling continued in the following spring. The City used the reservoir for a test run in 2009 and it ran well. We are monitoring the weir for acceptable levels of seepage which will be on going through 2010.



Ophir Reservoir



WTP Software Upgrade

In 2011 we will be upgrading the dated SCADA software at the water treatment plant that is approximately 15 years old and is obsolete.

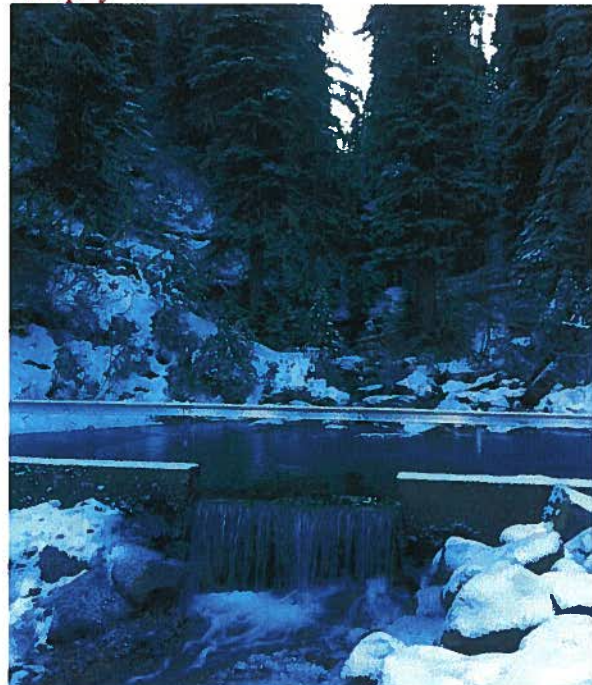
Murphy Creek Intake Upgrades in 2010

The City applied for a grant to assist in funding the upgrade of the Murphy Creek Raw Water intake. This project has been a high priority for the City for many years and funding confirmation was received in 2009, construction commenced in Summer 2010 and was completed by Fall 2010. In 2011, we will be completing the remainder of the contract which includes additional pipe replacement.

Murphy Creek Before



MurphyCreekAfter





Regulatory and Administration

Water Metering and Conservation Program

The City approved Policy #0440 "Residential Water Conservation Incentive Program" in May 2009. The Objectives are the City will provide to every existing residential home one water meter, remote reader and wire, but the home owner must install it at their expense. The funding was provided from the Operating budget and the Community Works Fund-Gas Tax Grant. The program runs until December 31, 2011 when penalties will apply to properties that are not metered. A low flush toilet rebate was also included in the policy and a \$50 rebate provided to home owners for the installation of their toilet.

There were 1662 water connections in early 2010 and 443 of those were metered. By the end of 2010 there were 1681 total connections and 647 were metered.

The City participated in a leak detection study that was provided through Columbia Basin Trust as a Community Leak Detection Program for all to participate in. Over 48 km of water mains were surveyed for possible system leakage and four locations were discovered, reported and repaired immediately following.

Emergency Response Plan and Dam Management

In 2010, the City is still working on their own emergency preparedness program, having previously relied upon the Regional District of Kootenay Boundary for support. As part of the review of the emergency preparedness, the City will be working with Engineers in 2011 to amend the water supply emergency response plan and dam safety plans.

Staffing

Trained, certified City staff work to maintain the 24 hour per day supply of safe drinking water to

users in Rossland. This is accomplished by ensuring that staff is on call every day of the year and that the previously mentioned surveillance, operating and control system (SCADA) is operating continuously. Water distribution work is also done by staff certified for their tasks: water main replacement, water service installation, fire hydrant and valve maintenance. Special tasks such as reservoir cleaning and leak detection are undertaken by qualified staff with the proper equipment and experience to complete the work.

The City has one Water Treatment – Level 1 and one Water Treatment – Level 2 Operator, one Water Distribution Level 2 and one Water Distribution Level 3 Operator, and three operators trained in Chlorine Handling. The City will consider a second Water Treatment Level 2 Operator with consideration of them being in place in 2009 or 2010. The City will consider a second Water Distribution Level 3 Operator with consideration of them being in place in 2009 or 2010.

Conclusion

This 2010 City of Rossland Water System Report is presented to the public, by way of posting on the City of Rossland website, as required by the British Columbia Drinking Water Protection Act and Regulations, as well as to meet the terms and conditions of the City's Water System Operating Permit CITYRO 950 issued by the Interior Health Drinking Water Officer.

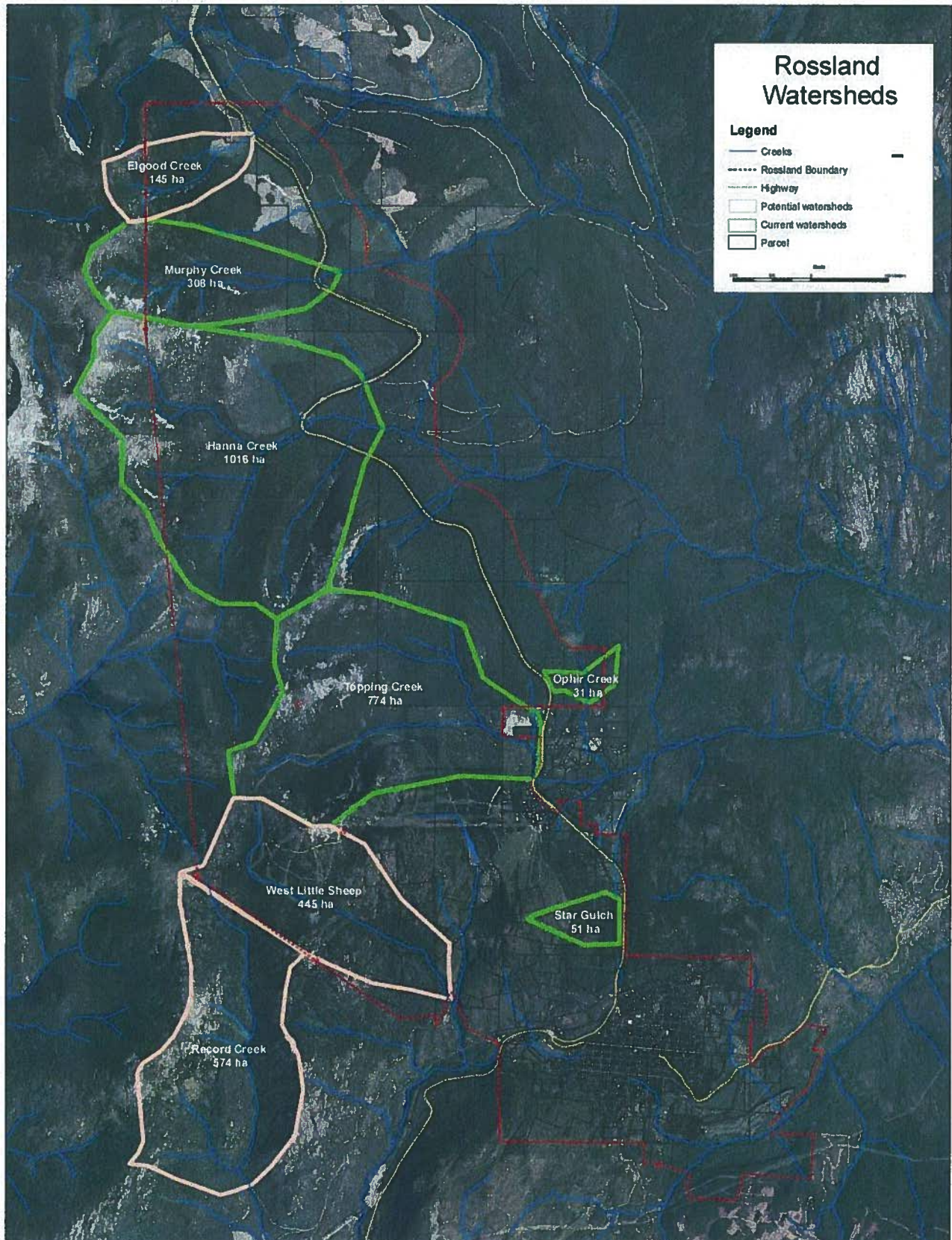
Darrin Albo
Manager of Operations
City of Rossland
Box 1179 Rossland BC
V0G1Y0 Canada

Darrin@rossland.ca
250-362-2328





Appendix A - Watershed Map



Appendix B – CARO Water Analysis Hanna Creek

CERTIFICATE OF ANALYSIS



CLIENT	Rossland, City of 1899 Columbia Ave- PO Box 1179 Rossland BC VOG 1Y0	TEL 1-250-368-7283 FAX 1-250-362-9634
ATTENTION	Darryl Pettitt	
RECEIVED / TEMP REPORTED	Aug-19-10 10:00 / 8.0 °C Aug-27-10	WORK ORDER K0H0797
COC #(s)	COC no #	PROJECT Comprehensive Analysis PROJECT INFO Water Samples

General Comments:

CARO Analytical Services employs methods which are based on those found in "Standard Methods for the Examination of Water and Wastewater", 21st Edition, 2005, published by the American Public Health Association (APHA); US EPA protocols found in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846", 3rd Edition; and protocols published by the British Columbia Ministry of Environment (BCMOE).

Methods not described in these publications are conducted according to procedures accepted by appropriate regulatory agencies, and/or are done in accordance with recognized professional standards using accepted testing methodologies and quality control efforts except where otherwise agreed to by the client.

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 - ug/g = micrograms per gram, equivalent to parts per million (ppm)
 - ug/m3 = micrograms per cubic meter of air
- "RDL" Reported detection limit
- "<" Less than reported detection limit
- "AO" Aesthetic objective
- "MAC" Maximum acceptable concentration (health-related guideline)
- "LAB" RMD = CARO - Richmond location, KEL = CARO - Kelowna location, SUB = Subcontracted

Please contact CARO if more information is needed.

CARO Analytical Services

Final Review Per:

Ed Hoppe, B.Sc, P.Chem For Sarah Speier, B.Sc.
Administration Coordinator (Acting)

SAMPLE DATA



CLIENT Rossland, City of **WORK ORDER #** K0H0797
PROJECT Comprehensive Analysis **REPORTED** Aug-27-10

Analyte	Result	Canadian DW Guidelines (May 08)	RDL	Units	Analyzed Method	Lab	Notes
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General Parameters

Hanna Creek (K0H0797-01) Matrix: Water Sampled: Aug-18-10 09:30

Alkalinity, Total as CaCO3	14.3		1.0	mg/L	Aug-20-10 APHA 2320 B	KEL	
Chloride	2.47	AO ≤ 250	0.10	mg/L	Aug-20-10 APHA 4110 B	KEL	
Colour, True	9	AO ≤ 15	5	Color Unit	Aug-19-10 APHA 2120 B	KEL	
Conductivity (EC)	39		2	uS/cm	Aug-20-10 APHA 2510 B	KEL	
Cyanide (total)	<0.01	MAC = 0.2	0.01	mg/L	Aug-20-10 APHA 4500-CN	KEL	
Fluoride	<0.10	MAC = 1.5	0.10	mg/L	Aug-20-10 APHA 4110 B	KEL	
Hardness, Total (Total as CaCO3)	14.1		2.91	mg/L	Aug-26-10 APHA 2340 B	RMD	
Nitrogen, Nitrate as N	<0.01	MAC = 10	0.01	mg/L	Aug-20-10 APHA 4110 B	KEL	
Nitrogen, Nitrite as N	<0.01	MAC = 3.2	0.01	mg/L	Aug-20-10 APHA 4110 B	KEL	
pH	7.39	AO = 6.5 - 8.5	0.10	pH Units	Aug-20-10 APHA 4500-H+	KEL	
Solids, Total Dissolved	33	AO ≤ 500	5	mg/L	Aug-24-10 APHA 2540 C	KEL	
Sulfate	1.5	AO ≤ 500	1.0	mg/L	Aug-20-10 APHA 4110 B	KEL	
Turbidity	0.2	Varies, See Guidelines	0.1	NTU	Aug-20-10 APHA 2130 B	KEL	
UV Transmittance @ 254nm	84.3		0.1	%	Aug-24-10 APHA 5910B	KEL	

Total Recoverable Metals by ICPMS

Hanna Creek (K0H0797-01) Matrix: Water Sampled: Aug-18-10 09:30

Aluminum	0.059	AO ≤ 0.1	0.050	mg/L	Aug-26-10 EPA 6020A	RMD	
Antimony	<0.0010	MAC = 0.006	0.0010	mg/L	Aug-26-10 EPA 6020A	RMD	
Arsenic	<0.0050	MAC = 0.01	0.0050	mg/L	Aug-26-10 EPA 6020A	RMD	
Barium	0.0113	MAC = 1	0.0050	mg/L	Aug-26-10 EPA 6020A	RMD	
Beryllium	<0.0010		0.0010	mg/L	Aug-26-10 EPA 6020A	RMD	
Boron	<0.040	MAC = 5	0.040	mg/L	Aug-26-10 EPA 6020A	RMD	
Cadmium	<0.00010	MAC = 0.005	0.00010	mg/L	Aug-26-10 EPA 6020A	RMD	
Calcium	4.0		1.0	mg/L	Aug-26-10 EPA 6020A	RMD	
Chromium	<0.0050	MAC = 0.05	0.0050	mg/L	Aug-26-10 EPA 6020A	RMD	
Cobalt	<0.00050		0.00050	mg/L	Aug-26-10 EPA 6020A	RMD	
Copper	<0.0010	AO ≤ 1	0.0010	mg/L	Aug-26-10 EPA 6020A	RMD	
Iron	<0.10	AO ≤ 0.3	0.10	mg/L	Aug-26-10 EPA 6020A	RMD	
Lead	<0.0010	MAC = 0.01	0.0010	mg/L	Aug-26-10 EPA 6020A	RMD	
Magnesium	1.01		0.10	mg/L	Aug-26-10 EPA 6020A	RMD	
Manganese	0.0028	AO ≤ 0.05	0.0020	mg/L	Aug-26-10 EPA 6020A	RMD	
Mercury	<0.00050	MAC = 0.001	0.00050	mg/L	Aug-26-10 EPA 6020A	RMD	
Molybdenum	<0.0010		0.0010	mg/L	Aug-26-10 EPA 6020A	RMD	
Nickel	<0.0020		0.0020	mg/L	Aug-26-10 EPA 6020A	RMD	
Phosphorus	<0.20		0.20	mg/L	Aug-26-10 EPA 6020A	RMD	
Potassium	0.22		0.10	mg/L	Aug-26-10 EPA 6020A	RMD	
Selenium	<0.0030	MAC = 0.01	0.0030	mg/L	Aug-26-10 EPA 6020A	RMD	
Silicon	13.7		2.0	mg/L	Aug-25-10 EPA 6020A	RMD	
Silver	<0.00050		0.00050	mg/L	Aug-26-10 EPA 6020A	RMD	
Sodium	2.13	AO ≤ 200	0.10	mg/L	Aug-26-10 EPA 6020A	RMD	
Uranium	<0.00020	MAC = 0.02	0.00020	mg/L	Aug-26-10 EPA 6020A	RMD	
Vanadium	<0.010		0.010	mg/L	Aug-26-10 EPA 6020A	RMD	
Zinc	<0.010	AO ≤ 5	0.010	mg/L	Aug-26-10 EPA 6020A	RMD	

SAMPLE DATA



CLIENT Rossland, City of **WORK ORDER #** K0H0797
PROJECT Comprehensive Analysis **REPORTED** Aug-27-10

Analyte	Result	Canadian DW Guidelines (May 08)	RDL	Units	Analyzed Method	Lab	Notes
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Microbiological Parameters

Hanna Creek (K0H0797-01) Matrix: Water Sampled: Aug-18-10 09:30

Collforms, Total	150	MAC < 1	1	CFU/100mL	Aug-19-10 APHA 9222	KEL	
Background Colonies	> 200		200	CFU/100mL	Aug-19-10 APHA 9222	KEL	
E. coli	1	MAC < 1	1	CFU/100mL	Aug-19-10 APHA 9222	KEL	



CERTIFICATE OF ANALYSIS

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ATTENTION	Darryl Pettitt		
RECEIVED / TEMP REPORTED	Jun-16-10 09:15 / 13.0 °C Jun-21-10	WORK ORDER	K0F0705
COC #(s)	COC with no #	PROJECT	Drinking Water
		PROJECT INFO	Water Samples

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Please contact CARO if more information is needed.

CARO Analytical Services

Final Review Per:

Sarah Speier, B.Sc.
Administration Coordinator (Acting)

SAMPLE DATA



CLIENT Rossland, City of
PROJECT Drinking Water

WORK ORDER # K0F0705
REPORTED Jun-21-10

Analyte	Result	Canadian DW Guidelines (May 08)	RDL	Units	Analyzed	Method	Lab	Notes
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Volatile Organic Compounds by PT-GCMS

City Hall (K0F0705-01) Matrix: Water Sampled: Jun-15-10 09:45

Bromodichloromethane	<0.001		0.001	mg/L	Jun-17-10	EPA 5030B/8260B	RMD	
Bromoform	<0.001		0.001	mg/L	Jun-17-10	EPA 5030B/8260B	RMD	
Chloroform	0.063		0.001	mg/L	Jun-17-10	EPA 5030B/8260B	RMD	
Dibromochloromethane	<0.001		0.001	mg/L	Jun-17-10	EPA 5030B/8260B	RMD	
Trihalomethanes (total)	0.063	MAC = 0.1	0.004	mg/L	Jun-17-10	EPA 5030B/8260B	RMD	
<i>Surrogate: Toluene-d8</i>	<i>117 %</i>		<i>80-120</i>		<i>Jun-17-10</i>			