

## 108 Waterworks Annual Report

In accordance with Interior Health Permit No. 14-124-00001 for 108 Waterworks; the following is an annual report on the status of the 108 Waterworks for the period of June 2016 to June 2017.

The report contains:

- An overview of maintenance for the system
- Average daily water flows
- Results of bacteriological and chemical water testing
- Well Head Protection Plan
- Groundwater Supply

Please forward questions or concerns to the Cariboo Regional District Environmental Services Department at (250) 392-3351 or 1-800-665-1636.

### **Electoral Areas**

A – Red Bluff-Quesnel South • B – Quesnel West-Bouchie Lake-Ten Mile • C – Barlow-Bowron • D – Wildwood-McLeese Lake  
E – Esler-Dog Creek • F – Horsefly-Likely-150 Mile House • G – Lac La Hache-108 Mile House • H – Canim Lake-Forest Grove  
I – Narcosli-Nazko • J – West Chilcotin • K – East Chilcotin • L – Lone Butte-Interlakes

### **Municipalities**

Quesnel • Wells • Williams Lake • 100 Mile House

## 108 Waterworks Maintenance Schedule

Inspect the total supply area for signs of leaks or abuse of the water system – weekly

Check pump houses to ensure proper operation of the pumps and automatic pump-up system – twice per week.

Service pumps including testing of any standby pumps, and any minor maintenance and cleanup – monthly.

Obtain water samples and deliver to Interior Health – monthly for bacteriological and yearly for chemical.

Clean inside of buildings, paint pipes as required and clear weeds around building annually or as required.

Check heating system in the pump houses during the winter months.

Twice per year, service all fire hydrants and standpipes and ensure clear access. Paint hydrants, standpipes and valve boxes as required.

Flush distribution pipelines 2 times per year and exercise all isolating gate valves.

Reservoirs are cleaned once per year in the spring.

Inspect storage tanks during winter months for any signs of freezing or icing problems. Clean, flush and disinfect annually.

As requested, test and inspect all new water connections, and attend to water service turn-off and turn-on.

Attend to unscheduled inspections, emergency calls and repairs as appropriate.

**2017**  
**108 Water System**  
**Average Daily Water Flows**

<u>Month</u>	<u>Cubic Meters</u>	<u>Imperial Gallons</u>
June	1176	258,720
July	1229	270,380
August	1302	286,440
September	803	176,660
October	749	164,780
November	686	150,920
December	672	147,840
January	638	140,360
February	602	132,440
March	609	133,980
April	659	144,980
May	1093	240,460
June	1347	296,340

## 108 Waterworks

### Microbiological Monthly Monitoring – June 2016 to June 2017

Month	Sampling Point	Total Coliforms Results	E. coli
June 2016	Kylo Road	< 1	< 1
	Easzee Drive	< 1	< 1
	Kitwanga Place	< 1	< 1
	Telqua	< 1	< 1
July 2016	Kylo Road	6	< 1
	Easzee Drive	< 1	< 1
	Kitwanga Place	2	< 1
	Telqua Drive	< 1	< 1
	Sepa Well	< 1	< 1
August 2016	Telqua Drive	< 1	< 1
	Kitwanga Place	< 1	< 1
	Kylo Road	< 1	< 1
	Easzee Drive	< 1	< 1
	Sepa Well	< 1	< 1
September 2016	Easzee Drive	< 1	< 1
	Kitwanga Place	< 1	< 1
	Kylo Road	< 1	< 1
	Telqua	< 1	< 1
	Sepa Well	< 1	< 1
October 2016	Kylo Road	< 1	< 1
	Easzee Drive	< 1	< 1
	Kitwanga Drive	< 1	< 1
	Telqua	< 1	< 1
	Sepa Well	< 1	< 1
November 2016	Kitwanga Drive	< 1	< 1
	Easzee Drive	< 1	< 1
	Kylo Road	< 1	< 1
	Telqua	< 1	< 1
	Sepa Well	< 1	< 1
December 2016	Kylo Road	< 1	< 1
	Kitwanga Drive	< 1	< 1
	Easzee Drive	< 1	< 1
	Telqua	< 1	< 1
	Sepa Well	< 1	< 1
January 2017	Easzee Drive	< 1	< 1
	Kitwanga Place	< 1	< 1
	Kylo Road	< 1	< 1

January 2017 cont.	Telqua Sepa Well	< 1 < 1	< 1 < 1
February 2017	Easzee Drive Kitwanga Place Kylo Road Telqua Sepa Well	< 1 < 1 < 1 < 1 < 1	< 1 < 1 < 1 < 1 < 1
March 2017	Kylo Road Kitwanga Place Easzee Drive Telqua Sepa Well	< 1 < 1 < 1 < 1 < 1	< 1 < 1 < 1 < 1 < 1
April 2017	Easzee Drive Kylo Road Kitwanga Place Telqua Sepa Well	< 1 < 1 < 1 < 1 < 1	< 1 < 1 < 1 < 1 < 1
May 2017	Kitwanga Place Kylo Road Easzee Drive Telqua Sepa Well	< 1 < 1 < 1 < 1 < 1	< 1 < 1 < 1 < 1 < 1
June 2017	Telqua Easzee Drive Kylo Road Kitwanga Place Sepa Well	< 1 < 1 < 1 < 1 < 1	< 1 < 1 < 1 < 1 < 1

Bacteriological tests are performed routinely for total coliforms and E. coli. The water is considered safe when no sample contains more than 10 total coliform organisms per 100 ml and no E.coli is present.

**WATER QUALITY MONITORING**  
**108 WATERWORKS**  
**CHEMICAL ANALYSIS**  
June 28, 2017

<b>Parameters</b>	<b>Sampling Point Sepa Well #2 Readings</b>	<b>Maximum Acceptable Concentration (MAC) – limit</b>	<b>Aesthetic Objective (AO) - limit</b>
<b>Conventional Parameters</b>			
PH, Laboratory	8.44 PH units		6.5-8.5 PH units
True Color	<5 CU		15 CU
Turbidity	<..10 NTU	1 NTU	≤ 5 NTU
Total Dissolved Solids	716 mg/L		500 mg/L
Dissolved Chloride	75 mg/L		250 mg/L
Dissolved Sulphate	76.2 mg/L		500 mg/L
Hardness	508 mg/L		500 mg/L
Nitrate and Nitrite	0.0608 mg/L	45 mg/L	
Nitrite	.0180 mg/L	1 mg/L	
<b>Total Metals Analysis</b>			
Mercury	< 0.010 ug/L	1 ug/L	
Arsenic	1.73 ug/L	10 ug/L	
Barium	13.8 ug/L	1000 ug/L	
Boron	83 ug/L	5000 ug/L	
Cadmium	<0.010 ug/L	5 ug/L	
Chromium	<1 ug/L	50 ug/L	
Lead	< 0.20 ug/L	10 ug/L	
Selenium	< 0.10 ug/L	50 ug/L	
Uranium	4.60 ug/L	20 ug/L	
Copper	1.19 ug/L		1000 ug/L
Iron	<5 ug/L		300 ug/L
Manganese	438 ug/L		50 ug/L
Zinc	<5 ug/L		5000 ug/L

CU = color units

mg/L = milligrams per liter

≤ Less than or equal to detection limit

NTU = nephelometric turbidity units

< = less than detection limit

ug/L = micrograms per liter

**MAC** – This standard sets the maximum acceptable concentration for various substances in the water. Concentration of a given substance above the MAC could be hazardous to health.

**AO** – This standard determines acceptable appearance (cloudiness), smell or taste of the water being tested.

## 108 Waterworks Well Head Protection Plan

The 108 waterworks obtains its water from two large groundwater wells and water quality is considered to be excellent from a health perspective. However, some staining of clothes and plumbing fixtures can occur from higher levels of manganese contained in the water. Protection of the ground water is needed to ensure that future generations can continue to utilize a safe water source.

Experience from elsewhere in Canada, the U.S. and Europe shows that preventing water quality degradation by implementing a well protection plan is the best way to protect a community well water supply. A well protection plan contains realistic protective measures to manage activities in the capture zone (or recharge area) to reduce the risk of contaminating the well supply.

The Ministry of Health in conjunction with the Ministry of Environment and the Ministry of Municipal Affairs have developed procedures and guidelines for the development and implementation of a well head protection plan. The various steps in the planning process include:

- 1) Form a planning team;
- 2) Define the capture zone (recharge area) of the community well;
- 3) Map potential sources of pollution in the capture zone;
- 4) Develop and implement protection measures to prevent pollution;
- 5) Develop a contingency plan against any accidents; and
- 6) Monitor, evaluate, and report on the plan annually.

The Cariboo Regional District, with grant funds that it has received from the Federal Government under the Community Works Fund, has retained the services of an environmental consultant to complete the various steps as listed above.

## **108 WATERWORKS GROUNDWATER SUPPLY AND TREATMENT PLANT**

The Cariboo Regional District has been assessing the effects that the existing groundwater supply wells are having on the water levels of the 108 and Sepa Lakes. Kala Geosciences concluded that the withdrawal of groundwater does affect lake levels by up to 33% during drought conditions, such as those that have occurred over the past few years.

An independent third-party review of all data and reports that suggested falling lake levels were associated with withdrawal of groundwater was conducted by Piteau Associates Engineering Ltd. This review suggests that observed lake levels are more likely the result of climate conditions and that withdrawal of groundwater may account for less than 25% of observed reduction of lake levels. The CRD will continue to monitor groundwater and lake levels.

Construction of the water treatment plant to remove Manganese started in April of 2017, with a scheduled completion by the end of March 2018.