

2015 Annual Water Report



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OVERVIEW

Rayleigh Waterworks District services approximately 701 connections within the improvement district boundaries. Using a multi barrier system, RWWD separates the particles from the water in three stages. Raw water is injected with polymer and then sent to settle in a large tank where the large particles (sludge) settle to the bottom. The water is then forced up through screens where even smaller particles are removed. It is then filtered through a mixed media comprised of Anthracite coal, Silica Sand and HD Sand. Finally the water passes through the UV Filter where even the smallest microbe is inactivated. The water is then dosed with minimal chlorine and pumped to the reservoir, located in the hills east of Rayleigh where gravity takes over and delivers it to your home.

The method of delivery and the quality of water being delivered to homes has changed and with that change RWWD has faced some increased responsibilities to both the rate payer and the governing authorities. We have new equipment that requires specific training, industry specific safety standards and, as always continuing education of our operators to ensure that the safest and cleanest drinking water is provided. We continue to monitor and test every aspect of the system to make sure that it is both safe and in good working order.

There are also other factors that RWWD must now take into consideration. We need to identify any and all possible dangers to not just our water supply, but to the treatment plant itself, the infrastructure and to employees. This takes a great deal of time and, often, money. The strainer that was discussed is now complete and operational. Some things we can't do ourselves so we must hire contractors and experts to help us.

We have now completed all four Interior Health Authority required modules for a water source protection plan. This protection plan gives steps to ensure that those who operate up river from us are aware of our presence and why it is so important that they contact us should anything happen that could pose a hazard. This could be anything from a CN derailment into the river, a transport truck carrying dangerous goods, a chemical spill at a mine in Vavenby or even a farmer who fertilizes his fields all could pose a risk to the water RWWD uses.

2015 was a quiet year and regular routine maintenance occurred throughout the winter months. With new river pumps purchased in 2014 the river intake performed well throughout the year.

The RWWD signed the agreement with the City of Kamloops pertaining to the Rae Mor Park irrigation billing.

RWWD became more stringent on implementing the Cross Connection flow program to protect the Distribution System from contaminants. Yearly certifications are expected to be presented and kept on file with the RWWD office.

WATER TREATMENT PLANT

The water treatment plant has been in operation since July 2009 and most of system glitches have been worked out, it has been running smoothly and performing at expected levels. There will always be some “tweaking” to the chemical dosing system as well as some minor adjustments to compensate for the high turbidity levels of the North Thompson River.

The RWWD staff continues to improve upon the operations of the Water Treatment Plant daily and we are striving to ensure that there is cost savings implemented each year with improved efficiency of the plant.

TURBIDITY

Turbidity is a term that refers to the relative clarity of the water. This ‘dirty’ water consists of fine particles, silt, organic and inorganic matter, plankton (yes!) and other microscopic organisms that get stirred up. Typically, Rayleigh sees extremely high turbidity levels during the spring snow melt, but the levels can increase during period of high rain as well. Bacteria, viruses and parasites such as Giardia and Cryptosporidium can attach themselves to the suspended particles in the water and then be ingested by those members of the population who are at-risk such as the elderly, people with compromised immune systems, or newborns. To help the water treatment plant adjust for changes in turbidity, RWWD has installed devices that count particles in the water at the beginning stage of the treatment process and operators adjust the polymer injection accordingly.

WATER QUALITY MONITORING PROGRAM

As is required by the Provincial Government and Interior Health Authority, RWWD did 405 tests in 2015. Of these 40 samples were sent to an independent lab for analysis. There the water is tested for Coli forms, Fecal coli forms and ecoli over a twenty four (24) hour period. RWWD also conducts internal bacteriological tests on a daily basis as well as testing chlorine levels. Our testing also includes continuous realtime turbidity monitoring of raw and finished water. The chlorine residual monitoring is both continuous realtime on finished water and spot checks on the distribution system.

All tests that were completed in 2015 came back safe.

Below is a sample chart of test results throughout the year.

Cammeray Drive

| <u>Sample Date</u> | <u>Coliform Total</u> | <u>Units of Measure</u> | <u>E.Coli Total</u> |
|--------------------|-----------------------|-------------------------|---------------------|
| | | | |

Davie Road

| <u>Sample Date</u> | <u>Coliform Total</u> | <u>Units of Measure</u> | <u>E.Coli Total</u> |
|--------------------|-----------------------|-------------------------|---------------------|
| 02/16/15 | <1 | CFU/100mL | <1 |
| 06/24/15 | <1 | CFU/100mL | <1 |
| 08/18/15 | <1 | CFU/100mL | <1 |
| 10/20/15 | <1 | CFU/100mL | <1 |

Strawberry Lane

| <u>Sample Date</u> | <u>Coliform Total</u> | <u>Units of Measure</u> | <u>E.Coli Total</u> |
|--------------------|-----------------------|-------------------------|---------------------|
| 03/19/15 | <1 | CFU/100ml | <1 |
| 07/02/15 | <1 | CFU/100ml | <1 |
| 08/25/15 | <1 | CFU/100ml | <1 |
| 10/28/15 | <1 | CFU/100ml | <1 |
| | | | |

Pinantan Place (North)

| <u>Sample Date</u> | <u>Coliform Total</u> | <u>Units of Measure</u> | <u>E.Coli Total</u> |
|--------------------|-----------------------|-------------------------|---------------------|
| 04/13/15 | <1 | CFU/100ml | <1 |
| 07/09/15 | <1 | CFU/100ml | <1 |
| 09/02/15 | <1 | CFU/100ml | <1 |
| 11/05/15 | <1 | CFU/100ml | <1 |
| | | | |

Hvas Place (West)

| <u>Sample Date</u> | <u>Coliform Total</u> | <u>Units of Measure</u> | <u>E.Coli Total</u> |
|--------------------|-----------------------|-------------------------|---------------------|
| 01/23/15 | <1 | CFU/100ml | <1 |
| 05/05/15 | <1 | CFU/100ml | <1 |
| 07/30/15 | <1 | CFU/100ml | <1 |
| 09/24/15 | <1 | CFU/100ml | <1 |
| 11/24/15 | <1 | CFU/100ml | <1 |

Rayleigh Elementary School

| <u>Sample Date</u> | <u>Coliform Total</u> | <u>Units of Measure</u> | <u>E.Coli Total</u> |
|--------------------|-----------------------|-------------------------|---------------------|
| 02/05/15 | <1 | CFU/100mL | <1 |
| 05/21/15 | <1 | CFU/100mL | <1 |
| 05/25/15 | <1 | CFU/100mL | <1 |
| 10/13/15 | <1 | CFU/100mL | <1 |
| 12/15/15 | <1 | CFU/100mL | <1 |

Yellowhead Highway (South)

| <u>Sample Date</u> | <u>Coliform Total</u> | <u>Units of Measure</u> | <u>E.Coli Total</u> |
|--------------------|-----------------------|-------------------------|---------------------|
| 04/20/15 | <1 | CFU/100mL | <1 |
| 07/14/15 | <1 | CFU/100mL | <1 |
| 09/10/15 | <1 | CFU/100mL | <1 |
| 11/09/15 | <1 | CFU/100mL | <1 |
| | | | |

Yellowhead Highway (North)

| <u>Sample Date</u> | <u>Coliform Total</u> | <u>Units of Measure</u> | <u>E.Coli Total</u> |
|--------------------|-----------------------|-------------------------|---------------------|
| 04/27/15 | <1 | CFU/100mL | <1 |
| 07/21/15 | <1 | CFU/100mL | <1 |
| 09/14/15 | <1 | CFU/100mL | <1 |
| 11/16/15 | <1 | CFU/100mL | <1 |

Reighmount Drive

| <u>Sample Date</u> | <u>Coliform Total</u> | <u>Units of Measure</u> | <u>E.Coli Total</u> |
|--------------------|-----------------------|-------------------------|---------------------|
| 01/29/15 | <1 | CFU/100mL | <1 |
| 02/13/15 | <1 | CFU/100mL | <1 |
| 05/14/15 | <1 | CFU/100mL | <1 |
| 08/06/15 | <1 | CFU/100mL | <1 |
| 08/11/15 | <1 | CFU/100mL | <1 |
| 09/28/15 | <1 | CFU/100mL | <1 |
| 10/05/15 | <1 | CFU/100mL | <1 |
| 12/02/15 | <1 | CFU/100mL | <1 |
| 12/08/15 | <1 | CFU/100mL | <1 |

ANNUAL WATER CONSUMPTION

Rayleigh Waterworks District processed and delivered a total of 521,378,310 LITERS of water to its users during 2013. The chart below gives per capita usage for peak and low seasons.

Rayleigh usage - all values in liters

| | | |
|---|---------------------------------|---|
| Total liters per year 535,388.25 | Per capita per year 205,595 | Yearly average per capita / day 563 |
| Peak liters per month (Jul) 27,412,006 | Peak per capita/month 45,540 | Peak per capita / day 1469 |
| Low liters per month (Feb) 3,106,120 | Low per capita/month 4,919 | Low per capita per day 176 |

Est population

701 connections @ 3.5

2453.50

STAFF CERTIFICATION

In accordance to the Interior Health Authority's *Condition on Permit* and the Environmental Operators Certification Program (E.O.C.P), all operators employed by the Raleigh Waterworks District must complete a specific schedule of training and obtain certain levels of certification each year. The following certifications have been achieved to date:

- Water Distribution Level 2
- Water Treatment Level 3
- Confined Spaces Entry
- AWI Filter
- First Aid
- Electronics
- Testing Electronics
- Instrumentation Principles

UPDATED EMERGENCY RESPONSE PLAN

With the new water treatment plant in place and providing clean safe drinking water to every connection within the boundaries of Raleigh Waterworks' District, one would assume that the residents of Raleigh have nothing to worry about. However there are threats to our drinking water that could cause a total shut down of the plant, damage our intakes and/or contaminate our distribution system. RWWD is working to identify and prevent those dangers, but should there be an event whereby the system is suspected of being compromised all residents will be informed in a timely manner via television, radio, newspaper, website AND sandwich boards to be situated at each entrance into Raleigh. Notices will be posted at the Raleigh Petro Can, on the bulletin board in the parking lot and on mail boxes through-out the community. It is our goal to ensure ALL residents of Raleigh are informed of any problems as quickly as possible. If necessary, RWWD will arrange for an alternate water source until we have been assured that the system can deliver safe water once again.

COMMUNITY SEPTIC

As many are aware, RWWD is responsible for maintaining and repairing several septic fields in Raleigh. There are 145 homes connected to the community septic system and these homes are charged accordingly. Historically, there have been very few problems with the fields and systems, but as they age there are a number of things that can go wrong.

Each year all residents are reminded that it is their responsibility to ensure that they are caring for their septic system accordingly by way of a special newsletter entitled The Waterline: Septic Edition. Although the newsletter is geared toward residents who manage their own private septic systems, the hints and tips apply to those connected to the community system as well. As the frequencies of these problems occur, the cost to maintain and repair the system will increase.