City of Courtenay

2016 Annual

Drinking Water Quality Report

CITY OF COURTENAY
Public Works

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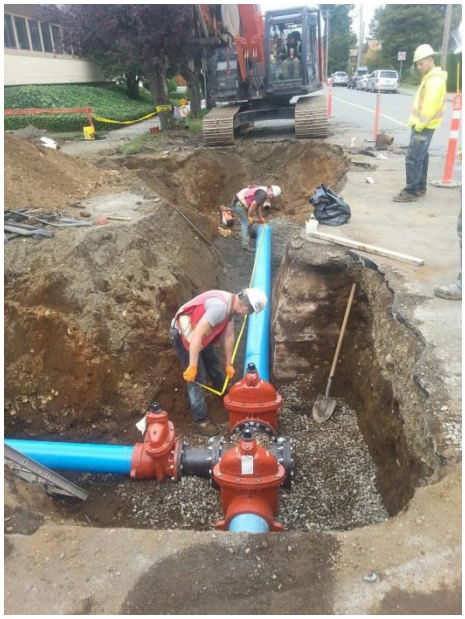
1. Introduction

In 2003, the Provincial Government passed legislation that brought into effect the *British Columbia Drinking Water Protection Act* (the Act) and the *Drinking Water Protection Regulation* (the Regulation). The Act and Regulation detail municipal responsibilities as a water supplier.

The Act covers all water systems other than single-family dwellings and systems excluded through the regulation. It outlines requirements for water suppliers in terms of ensuring that the water supplied to their users is potable — and meets any additional requirements established by the Regulation or by the water supply system's operating permit, as set by the local drinking water officer. The Regulation sets out requirements for drinking water quality including treatment, construction and operation of water systems, monitoring, reporting, and public notification for water quality advisories.

The City of Courtenay (the City) supplies potable water to approximately 25,000 residents and ICIA customers within City boundaries. The City has a bulk water agreement in place to purchase water from the Comox Valley Regional District (CVRD).

2. General Description



The City operates and maintains a Class IV Water Distribution System. This system is designed to adequately supply water to its end users and in the event of an emergency provides the required flow for fire protection.

The City's water system consists of:

- 170 km of water mains;
- 730 hydrants;
- 4 pressure reducing valves;
- 2150 mainline valves; and
- 1 booster station containing 5 pumps.

3. Island Health

Island Health administers the Act and the Regulation. The Drinking Water Officer is responsible for issuing operating permits and monitoring compliance of drinking water systems. In BC the surface water treatment objectives for microbiological parameters are:

- 4 log (99.99%) removal or inactivation of viruses;
- 3 log (99.9%) removal or inactivation of *Giardia Lamblia* and *Cryptosporidium;*
- 2 treatment processes in place;
- 1 NTU or less turbidity in finished water; and
- 0 detected *E.coli*, total and fecal coliforms.

The City of Courtenay is required to meet these objectives under their operating permit.

4. Source Water

The water provided by the CVRD is sourced from Comox Lake and collected from the Puntledge River at the BC Hydro penstock. Water travels from the penstock via two transmission pipelines to the CVRD's chlorination station where it is metered, sampled and chlorinated.

4.1 *Source Water Quality*

The CVRD is in the initial planning stages to construct a new deep water intake in Comox Lake and a treatment plant that includes filtration to meet the Surface Water Objectives by 2021, as required by Island Health.

Comox Lake
photo: Wikimedia Commons

4.2 *Source Water Testing*

Quality of the source water is monitored and tested by the Comox Valley Regional District. The CVRD water quality report for 2016 can be found on their website.
http://www.comoxvalleyrd.ca/EN/main/departments/water-services/water-quality-reports.html

4.3 *Transmission System*

Water supply is distributed to two reservoirs in Courtenay via large transmission mains all owned and operated by the CVRD. The Courtenay East reservoir is located off Ryan Road, the Courtenay West reservoir is located on Lake Trail Road. These reservoirs connect with the City's distribution mains to transport water to residential, commercial and institutional water services.

5. Distribution Sampling

In order to ensure water quality standards and regulations are met the City continuously tests the water quality throughout the distribution system. Under guidance from Island Health the City has installed a series of water sampling test points. The City completes weekly sampling and submits the samples to Island Health for testing.

If a sample shows evidence of Total Coliforms and/or E.coli, the Lab will immediately contact, by phone, both the City Public Works and Island Health in keeping with the requirements of the *Regulation*.

5.1 *Sample Requirements*

The *Regulation* requires the City to take a minimum number of samples per month based on the following population figures:

- Less than 5,000 — 4
- 5,000 to 90,000 — 1 per 1,000 population
- More than 90,000 — 90 plus 1 per 10,000 population in excess of 90,000

5.2 *Sample Stations*

The City has ten sample stations located throughout the distribution system with varying flow patterns, rates and conditions. See Figure 1 for sample station locations.

5.3 *Distribution Sampling Overview*

The City's current population mandates a minimum of 26 samples to be collected and tested each month. Sampling frequency and locations continue to meet the monitoring protocol set out by Island Health.

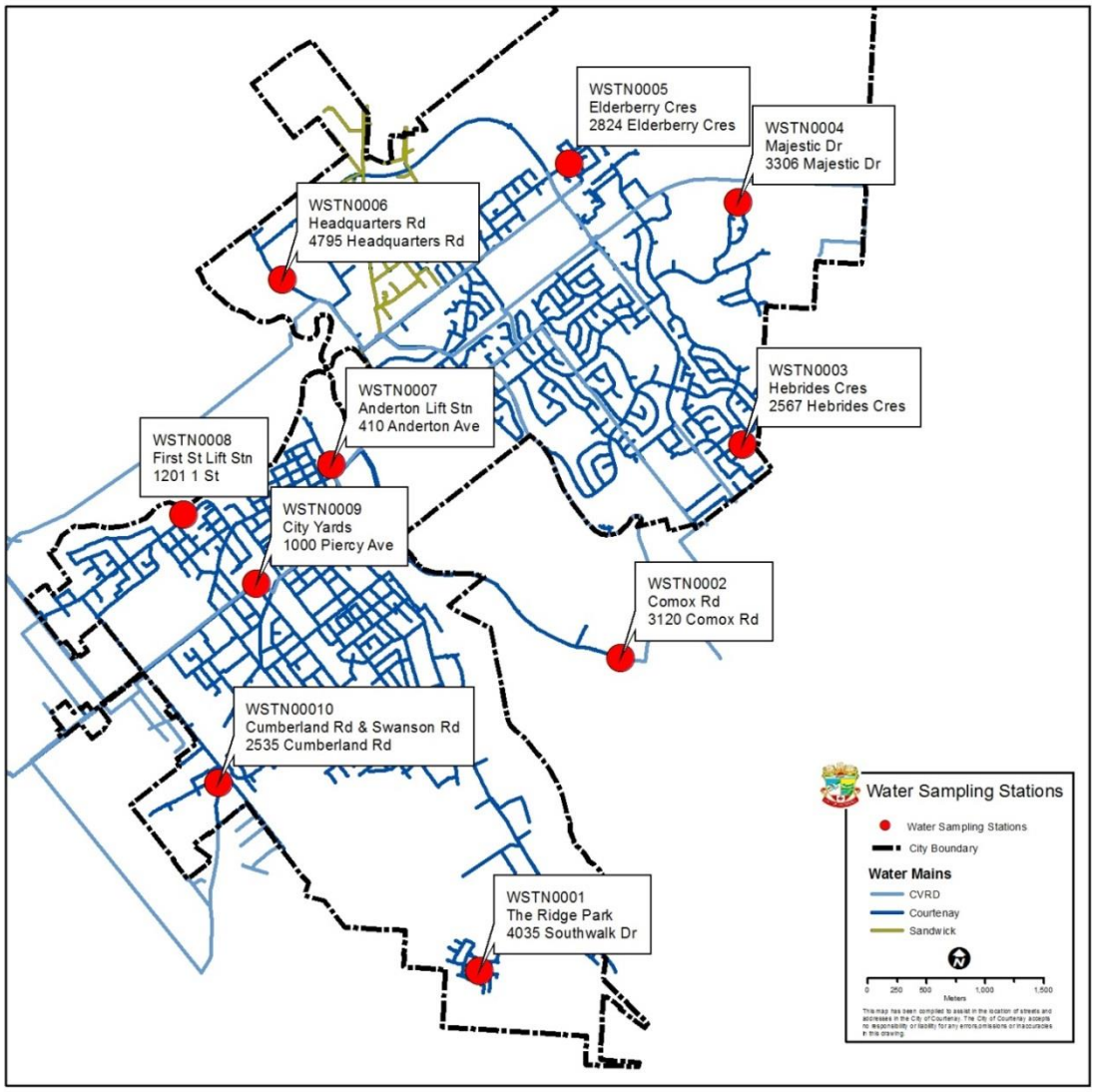


Figure 1. Sample Station Locations.

6. Standards & Regulatory Distribution Testing

The *Regulation* requires a supplier to collect and test samples from the distribution system. The Canadian Centre for Disease Control Laboratory in Vancouver analyzes all water samples sent by Island Health.

Water sampling results for 2016 can be found on the Island Health website:
http://www.viha.ca/mho/water/water_sampling_results.htm

6.1 *Distribution Testing Parameters*

Physical and bacteriological parameters are collected, sampled and tested from each of the City's sampling sites; 4 sites are sampled weekly, 6 are sampled on a rotating biweekly schedule.

6.1.1 Physical Parameters

- Free chlorine residual measured in milligrams per litre (mg/L)
    - Guideline is 0.2mg/L
- Turbidity measured in nephelometric turbidity units (NTU)
    - Guideline is 1 NTU
    - Guideline is < 0.5 µg/L

6.2 Free Chlorine Residual

In order to control the re-growth of bacteria in the distribution system it is important to maintain a disinfectant residual. The minimum disinfectant residual of 0.2 mg/L (milligrams per liter) free chlorine is maintained.

6.2.1 Results

In 2016, 355 samples were collected and tested; 3 samples fell below the benchmark of 0.2mg/L of free chlorine residual.

6.3 Turbidity

Turbidity is a valuable indicator of water quality. Turbidity is a measure of the cloudiness of water caused by suspended particles given in NTU. The measurement is a quantification of the scattering and absorbtion of light by these suspended particles; the higher the turbidity the cloudier the water. Water with high turbidity may shield harmful organisms which increases disinfectant demand.

6.3.1 Results

In 2016 there were 4 boil water advisories issued totalling 48 days due to high turbidity events (> 1NTU) in Comox Lake following heavy rainfall.

6.4 Total Coliforms & Escherichia coli

Total coliform and *E. coli* are typically used as indicators for overall drinking water quality. The *Regulation* established the parameter and standards for the microbiological quality of water.

6.4.1 Total coliform bacteria

Standard:

(a) 1 sample in a 30 day period
No detectable total coliform bacteria per 100 ml

(b) More than 1 sample in a 30 day period.
At least 90% of samples have no detectable total coliform bacteria per 100 ml and no sample has more than 10 total coliform bacteria per 100 ml

6.4.2 Escherichia coli

Standard: No detectable *E. coli* per 100 ml

6.4.3 Results

In 2016, no collected samples tested positive for total coliforms or *E.coli*.

7. Unidirectional Flushing Program

The City of Courtenay's Unidirectional Flushing (UDF) program is aimed to enhance the overall water quality within the water distribution system and improve systems operations by: reducing turbidity, removing sediment, silt and biofilms, lowering chlorine demand, increasing system hydraulic capacity and increasing the life of system components. This program supports the City's Asset Management System as it allows for in situ condition inspections of the water system and helps maintain water infrastructure integrity, thus increasing the service life of the system and its appurtenances.

A pilot study in Area 10 is planned for 2017. See Figure 2 for a map of the UDF areas.

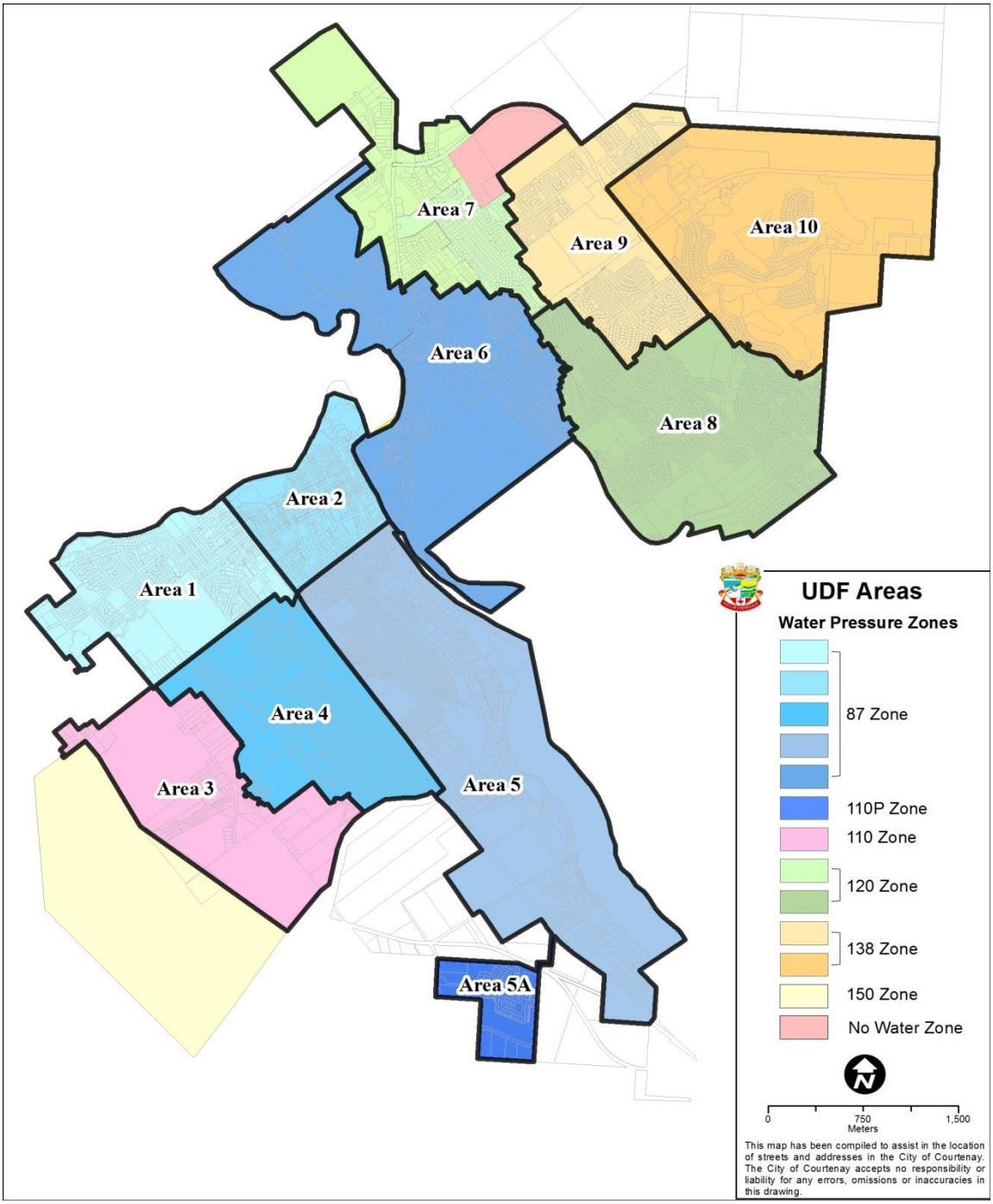


Figure 2.

UDF Areas.

8. Cross Connection Control Program

The City of Courtenay's Cross Connection Control Program is aimed to reduce risks and the likelihood of contamination by eliminating or controlling unprotected cross connections within the potable water system. Initially the program will be focused on City-owned assets, buildings and facilities and then expanded to include ICIA connections.

In 2016 the City of Courtenay contracted MTS Inc. to complete an inventory of all cross connections and existing backflow assemblies or devices and assign a hazard ranking for all City owned buildings and facilities.

A Water Technician position will be developed and filled in 2017; the responsibilities of the position, in part will include the oversight of the CCC program, maintenance program development, system optimization and UDF development. The designate will be a BCWWA-certified backflow inspector and act as the CCC Inspection Officer for the City.

9. System Improvements

The City continues to make improvements to the overall distribution system and its appurtenances. Projects are identified and prioritized within the Asset Management Program enabling sound financial planning to maintain and enhance level of service to the community.

System Improvements in 2016 included:

- Main replacement at 3rd Street - Cliffe Avenue to England Avenue. Replaced ~315 m of AC 150 and AC 200 with PVC 150 and PVC 200.
- Main replacement at Anderton Avenue - 5th Street to 6th Street. Replaced ~110 m of CI 150 with PVC 150 and PVC 200.
- Main replacement at Dingwall Road - Western Road to McLauchlin Drive. Replaced ~330 m of AC 150 and AC 200 with PVC 150, PVC 200 and PVC 250.
- Main replacement Duncan Avenue at 4th Street to 6th Street. Replaced ~ 240m of CI 150 with PVC 150, PVC 200, and PVC 300.
- Sandwick integration engineering design.

10. Operator Qualifications

The Environmental Operator Certification Program (EOCP) is a not-for-profit society that oversees the certification of water and wastewater operators in BC. A Class IV Distribution System is required to have 1Water Distribution Level IV Operator on staff. The City has 11 EOCP-certified water operators with the following qualifications:

- Water Distribution I - 2 certified employees
- Water Distribution II - 7 certified employees
- Water Distribution IV - 2 certified employees
- Water Treatment I - 1 certified employee

11. Emergency Response Plan

The *Operational Maintenance Manual and Emergency Response Plan* has been prepared to provide staff with an effective plan to respond to an emergency related to the City's water distribution system.