



Making a difference...together

**WILDERNESS MOUNTAIN WATER SERVICE
ANNUAL REPORT
OCTOBER 29, 2012**

System Overview

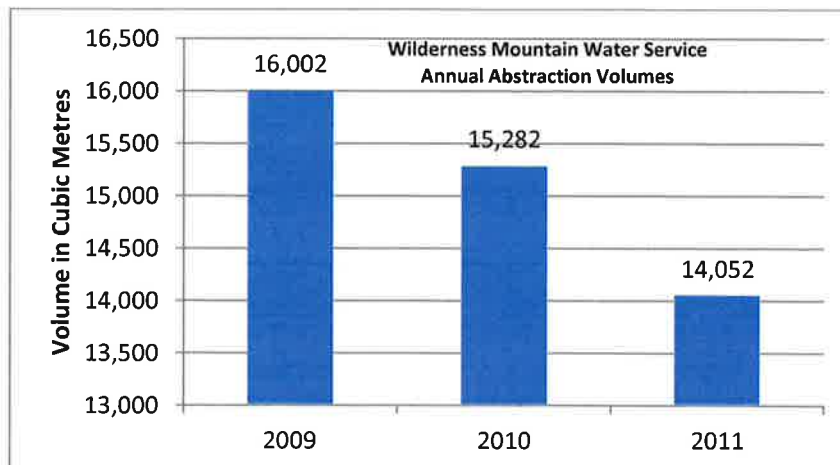
Established in the early 1980's, the small water system consisting of 84 lots, 68 of which are developed, was operated and maintained by a private company until converted into a Capital Regional District (CRD) service in 2009. Conditional to becoming a CRD service, upgrades to the water system to meet current drinking quality guidelines were required. The source of water for the Wilderness Mountain Water System (WMWS) is Wilfred Reservoir, a small surface water body created by the construction of two dams. Prior to the upgrade works, water drawn from the reservoir was disinfected with chlorine. The water was then pumped into the distribution system which is comprised a network of polyvinyl chloride (PVC) water mains. The 60,000 Imperial gallons of balancing storage in two tanks permits the system to operate effectively under all water need situations.

The newly commissioned treatment facility provides filtration, ultraviolet (UV) and chloramination (ammonia and chlorine) primary disinfection to the community's drinking water. In recent years, water purveyors have increasingly turned to chloramination as an alternative to chlorination using only chlorine because the chloramines provide a longer lasting residual in the distribution system, lower chlorinous taste and lower disinfection byproducts.

Water Supply and Consumption

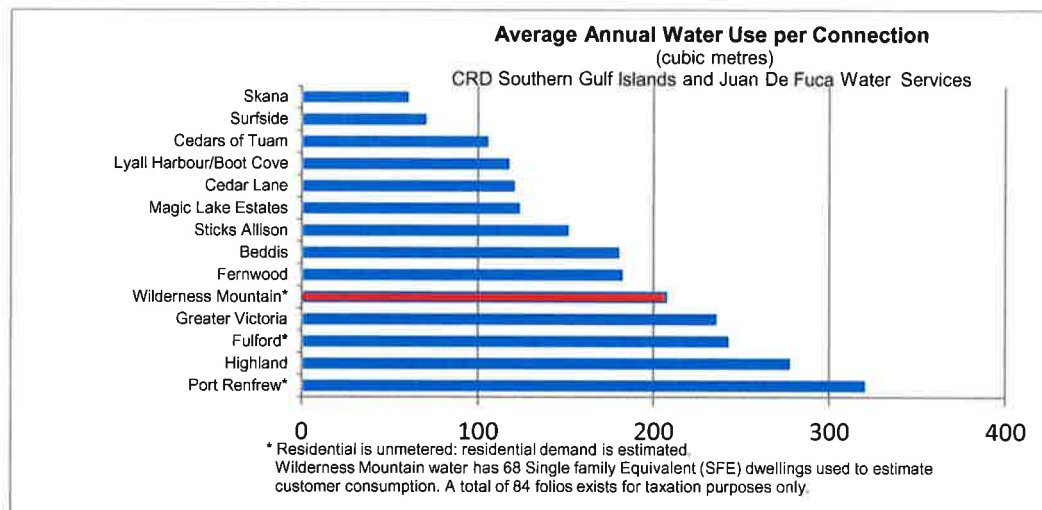
In 2011, 14,052m³ of water was supplied from Wilfred Reservoir, approximately 8% less than the previous year's production of 15,282 m³. The lower water production in 2011 is due primarily to repairing a substantial number of water main leaks early in the year. The water supply trend for the Wilderness Mountain system is shown in **Figure 1**. Based on 2011 volumes, the average annual consumption per individual connection in the Wilderness Mountain Water System was approximately 207 m³. For comparison, the average annual use per connection for other CRD-operated water systems is shown in **Figure 2**.

Figure 1. Annual Water Volumes Supplied from Wilfred Reservoir



Although the majority of customer connections are metered (original to subdivision in 80's), the meters have not been read regularly as their reading accuracy is unknown. Therefore, since water consumption is unknown, the amount of non-revenue water (water loss through fire-fighting, system flushing and illegal connections) is also unknown. Non-revenue water in a typical small water system is presumed to be approximately 20% of its treated water production (Environment Canada 2004 Report *Threats to Water Availability in Canada*). **Figure 1:** Average Annual Water Use per Connection values includes non-revenue water.

Figure 2. Average Annual Water Use per Connection



Drinking Water Quality

Typical Wilderness Mountain Water System water quality characteristics for 2011 include:

Untreated Source Water Entering the Treatment Plant

- In 2011, bacteriological samples were collected once every two weeks. Broadly, there are no specific limits for bacterial level in the untreated source water. However, the levels listed below easily meet the US Environmental Protection Agency limit of 20 *E.coli* in at least 90% of the samples to remain an unfiltered surface water supply.
 - Total coliform bacteria median of 158 colony forming units (CFU) per 100 mL and ranging from 20 to 1,120
 - *E. coli* bacteria median of 1 CFU/100 mL and ranging from 'Not Detectable' to 8.
- Source water turbidity (cloudiness) was usually below the limit of 1 NTU (median of 0.81 and ranging from 0.57 to 1.28)
- Total organic carbon is moderate at 3-4 milligrams per litre (mg/L)
- No *Giardia* or *Cryptosporidium* parasites detected in either summer or winter samples in 2011
- Metals are typically below *Guidelines for Canadian Drinking Water Quality (GCDWQ)* limits
- In 2010, Wilfred Reservoir experienced a substantial spring algal bloom (primarily a yellow-brown algae called *Uroglena sp.*). In 2011, algal numbers have been relatively low. Very low levels of blue-green algae have been observed over the past two years. No water quality complaints were noted.

Treated Distribution System

- The treated water in the distribution system is bacteriologically safe to drink. In 2011, three total coliform positive samples were observed. All re-samples were negative for total coliforms and no single sample contained more than 10 total coliforms.

- Disinfection by-product (total trihalomethanes and halo-acetic acids) results varied in the distribution system with both parameters marginally exceeding the limits at times.

Routine water quality data is posted on the CRD website at:

<http://www.crd.bc.ca/jdf/water/wilderness/qualityreports.htm>

Water System Upgrade Project

As a condition of conversion of the Wilderness Mountain Water System to a CRD local service, the CRD required that the infrastructure be upgraded to comply with legislated drinking water requirements. The original plan was to construct a new water treatment plant based on a Dissolved Air Flotation (DAF) process that had been installed in similar surface water supplied CRD water systems on Salt Spring Island and the Southern Gulf Islands. However, in 2010, the cost to build such a plant was estimated to be substantially more than the available budget. Therefore, an engineering study was completed in April 2011 which recommended a different upgrade approach that was within the project budget and still met the criteria specified by the Vancouver Island Health Authority.

A request for proposals was issued for design and construction engineering services to complete the recommended upgrades. Stantec Consulting Ltd. of Victoria was awarded the contract for these engineering services and their upgrade design was completed in August 2011. A call for construction tenders was issued and two qualified bids were received; however, both exceeded the available budget and the consultant's estimate. Stantec revised the design in an effort to reduce costs to within budget, while still meeting the project objective. The revised design was re-tendered and awarded to the lowest compliant bidder, Ridgeline Mechanical of Courtney BC.

The project is now considered substantially complete and is delivering treated water to the community.

Operations

The WMWS has operated reliably in the past year. Significant maintenance activities in the past year include:

- Replacement of the old mechanical meter with a new magnetic flow meter (mag meter) at the pump house to accurately measure water abstraction from Wilfred Reservoir
- Installation of a flow-controlled chlorine injection pump
- Preventive maintenance, primarily of pump station equipment
- Annual tank cleaning, flushing and exercising of distribution system isolation valves
- Routine water sampling
- Weekly security checks of reservoirs

Financial Report

Attached are copies of the *Statements of Operations (Unaudited)* for Wilderness Mountain Water and Sewer services as prepared by CRD Finance and Corporate Services for the year 2011. The statements provide an overview of the revenues and expenditures for the year.

Revenue includes parcel taxes (*Transfers from government*) and user fees (*Sale of services*), and small amounts for interest on savings and miscellaneous revenue such as connection charges and late payment charges (*Other revenue*). *Expenses* include all costs of providing the service. *General government services* include budget preparation, financial management, utility billing, and risk management services. *Other expenses* includes all other costs to administer and operate the water system, and the principal and interest payments on borrowing to finance capital projects. *Other fiscal services* includes administration costs for loans.

The difference between *revenue* and *expenses* is reported as *Net revenue (expenses)*. Any transfers to or from capital or reserve accounts for the service (*Transfers to own funds*) are deducted from this amount and it is then added to any surplus or deficit carry forward from the prior year, yielding an *Accumulated surplus* (or deficit) that is carried forward to the following year.

The 2011 revenue of \$96,397 included \$42,798 of parcel tax and \$53,334 of user fees. The total expenses were \$79,717 for operation and administration of the service, including all operating expenses and insurance.

The difference between revenue and expenses in 2011 amounted to a net revenue of \$16,680 which was transferred to the Wilderness Mountain Water Service Capital Reserve Fund. As of December 31, 2011, the Wilderness Mountain Water Service held \$272,000 of Capital Funds on hand.

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Concurrence

GP/TT:ls
Attachment: 1

CAPITAL REGIONAL DISTRICT

WATER REVENUE FUND Statement of Operations (Unaudited) For the Year Ended December 31, 2011

| | Wilderness Mountain Water Service |
|---|--|
| Revenue | |
| Transfers from government | \$ 42,798 |
| Sale of services | 53,334 |
| Other revenue from own sources: | |
| Interest earnings | 142 |
| Other revenue | 123 |
| Total revenue | 96,397 |
| | |
| Expenses | |
| General government services | 4,050 |
| Grants in aid | - |
| Other expenses | 75,498 |
| Salaries and wages | - |
| Fiscal services | 169 |
| Recovery | - |
| Total expenses | 79,717 |
| | |
| Net revenue (expenses) | 16,680 |
| Transfers to own funds: | |
| Capital Funds | - |
| Reserve Funds | 16,680 |
| Equipment Replacement Fund | - |
| Transfers from own funds: | |
| Reserve Funds | - |
| | |
| Annual surplus | - |
| Accumulated surplus, beginning of year | - |
| Accumulated surplus, end of year | \$ - |