

REGIONAL DISTRICT OF NANAIMO

Water Service Area Annual Report 2015



Nanoose Bay Peninsula Water Service Area

June 2016

REGIONAL DISTRICT OF NANAIMO

Water & Utility Services Department

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1. Introduction

The following annual report describes the Nanoose Bay Peninsula (NBP) Water Service Area and summarizes the water quality and production data from 2015. This report also includes a summary of inquiries and complaints, completed and proposed maintenance activities, the Emergency Response Plan, and the Cross Connection Control Program. This report is to be submitted to Island Health by the Spring of 2016.

2. Nanoose Bay Peninsula Water System

The Nanoose Bay Peninsula Water System was established in 2005 by amalgamating the water service areas locally known as Madrona, Wall Beach, Driftwood, Nanoose (Beachcomber), Fairwinds, Arbutus Park, and West Bay. The previous service areas, if referred to in this report, are noted as neighbourhoods within the NBP service area. In 2015, the Nanoose Peninsula Water System was comprised of 2098 residential and 67 commercial water service customers.

The water supply originates from a series of groundwater wells located in the area, and is supplemented seasonally (as required) with water from the Englishman River. The water supply is chlorinated and stored in several reservoirs throughout Nanoose Bay. A drinking water filtration plant is located at 2480 Nanoose Road. This filtration plant has been in operation since November 2011, and its purpose is to filter out iron and manganese particulate from Fairwinds Wells #1, 2, and 3, and the West Bay Well #3. A portable back-up generator is available in the event of a power outage. A map of the Nanoose Bay Peninsula Water Service Area is provided in Appendix A for reference.

2.1 Groundwater Wells

Twelve groundwater production wells are located in Nanoose Bay for water supply. Nanoose #7 has not yet been put into service, but is being considered for the Aquifer Storage and Recovery program. Nanoose #6 hasn't been used since 2010 due to operational challenges with chlorination.

Well / Name	Well Depth	Wellhead Protection In Place	Treated/Untreated with Chlorine
Wallbrook #1	16.9 m	Yes	Treated
Madrona #4	52.1 m	Yes	Un-treated
Madrona #8	17.1m	Yes	Treated
Nanoose #2	53.3 m	Yes	Treated
Nanoose #3	52.7 m	Yes	Treated
Nanoose #4	59.1 m	Yes	Treated
Nanoose #6	107.0 m	Yes	(Not in use)
Nanoose #7	60.6 m	Yes	(Not in use)
Fairwinds #1	69.8 m	Yes	Treated
Fairwinds #2	75.3 m	Yes	Treated
Fairwinds #3	72.2 m	Yes	Treated
West Bay #3	75.6 m	Yes	Treated

2.2 Reservoirs

Six water storage reservoirs are present in the Nanoose Bay Peninsula Water System as follows;

- Madrona (concrete) - 485 m³ (100,000 imperial gallons) capacity
- Eagle Heights (concrete) - 341 m³ (75,000 imperial gallons) capacity
- Dolphin (steel) - 455 m³ (100,000 imperial gallons) capacity
- Fairwinds Res #1 (concrete) - 701 m³ (154,000 imperial gallons) capacity
- Fairwinds Res #2 (concrete) - 701 m³ (154,000 imperial gallons) capacity
- Arbutus Park (concrete) - 568 m³ (125, 000 imperial gallons) capacity

The Beachcomber reservoir was demolished in 2015. The cost to repair this aging steel reservoir outweighed its usefulness in the water system. The location of a new water storage reservoir is currently being considered.

2.3 Distribution System

The water distribution system in Nanoose Bay is summarized in the table below. Fire hydrants (287) are located throughout the water service area.

Watermain Material	Length of mains in NBP Water Service Area	Prevalence in Water Service Area
<u>Asbestos-concrete:</u> 150mm or smaller 200mm or larger	9.9 km 2.7 km	12.4% 3.4%
<u>PVC:</u> 150mm or smaller 200mm or larger	22.9 km 33.5 km	28.9% 42.1%
<u>Ductile Iron:</u> 150mm or smaller 200mm or larger	0.2 km 10.3 km	0.2% 13.0%

Note: 'PVC' is poly-vinylchloride (plastic)



Photo of Fairwinds Reservoir No. 1

3. Water Sampling and Testing Program

Water sampling and testing is carried out weekly in the distribution system. The following table includes a summary of all testing:

Timing	Location	Tests
Weekly	RDN (in-house) Laboratory	Total coliforms, E.Coli, pH, TDS, Temperature, Conductivity, Turbidity, Chlorine residual, Salinity
Monthly (Health Dept.)	BC Centre for Disease Control	Total coliforms, E.Coli
Monthly	RDN (in-house) Laboratory	Total Iron and Manganese
Annual Source Water Testing (every Fall)	Maxxam Labs	Complete potability testing of all raw well water, including T-Ammonia
Annual System Water Testing (every Spring)	Maxxam Labs	Complete potability testing of distribution system, including T-Ammonia
Filtration Plant Output Once per month	Maxxam Labs	True colour, Ammonia, Iron, Manganese, and Chloramines

4. Water Quality - Source Water and Distribution System

Up-to-date water quality reports and lab data are posted monthly on the RDN website at www.rdn.bc.ca in the SERVICES section, under “Water Services” then “WaterSmart Communities”. Tables of water quality testing results for both the source water and distribution system are provided at the end of this report under Appendix B.

5. Water Quality Inquiries and Complaints

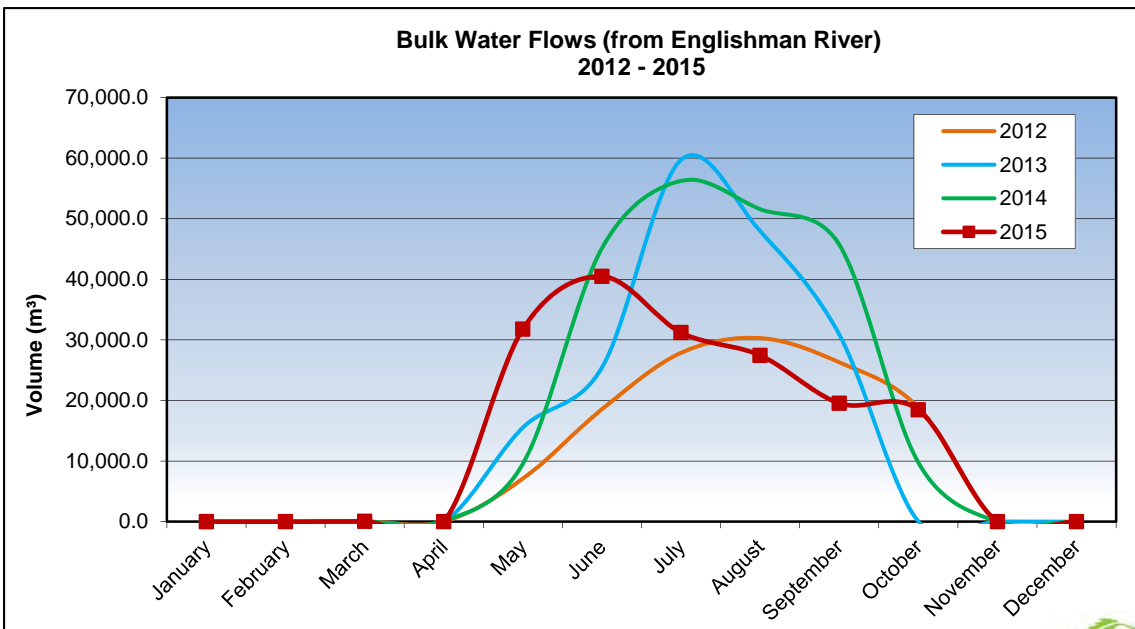
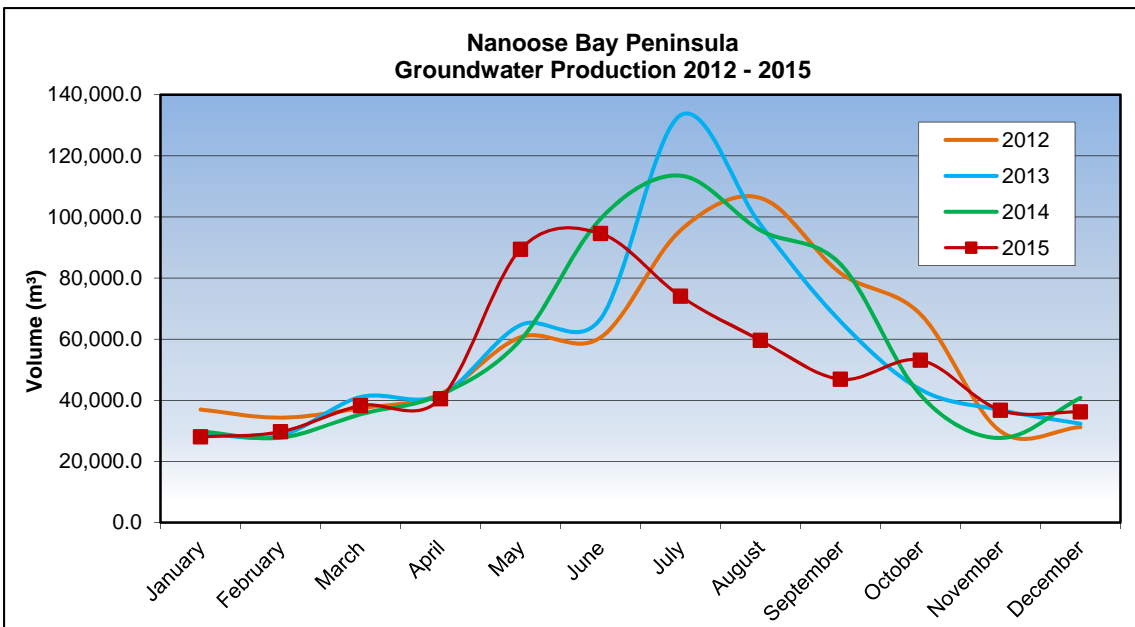
The tap water quality has improved with the installation of the Nanoose Bay Peninsula water filtration plant. Filtered groundwater from the Fairwinds and West Bay wells is mixed with treated water from the Englishman River (seasonally, as required) and stored in the same six reservoirs throughout Nanoose Bay.

Several inquiries were received from the Nanoose Bay Peninsula water service area about whether in-home water softeners were needed. The answer was no, but that a person could use one at their discretion. No additional water supply was available from RDN water sources to facilitate subdivisions in 2015. However, several property owners reportedly purchased water allocations from Maz-Can Investments since extra water was available from the development of the Parker Road well. Three small subdivisions are pending approval in early 2016. A monitoring network of private drinking water wells was set up around the Parker Road well to address concerns from nearby property owners that their wells would go dry.

Iron and manganese water discolouration was still apparent in the drinking water in the Madrona Drive area intermittently in 2015. Flushing watermains and water services cleared things up. Additional complaints were received about high water bills during 2015, and were addressed through leak repairs.

6. Groundwater Production and Consumption

The monthly groundwater well production and bulk water flows for the past 4 years are shown in the charts below. Groundwater production in 2015 was generally lower in comparison to previous years, with the exception of an early peak in May/June, which can be attributed to an unseasonable warm and dry spring. Bulk water flows from the Englishman River also exhibited an early peak, but were typically lower than in 2013 and 2014 because of the Stage 4 watering restrictions that were in place in early July.



Consumption

In the Fall/Winter of 2015, the average usage per home in Nanoose Bay was 0.43 cubic metres per day (95 imperial gallons). In the summer, the average water usage was 1.01 cubic metres per day (222 imperial gallons). Based on these figures, the annual consumption per capita is estimated to be 283 L/day (based on 2.4 people/household). This consumption is 5% more than the RDN system average of 276 L/day/capita in 2015.

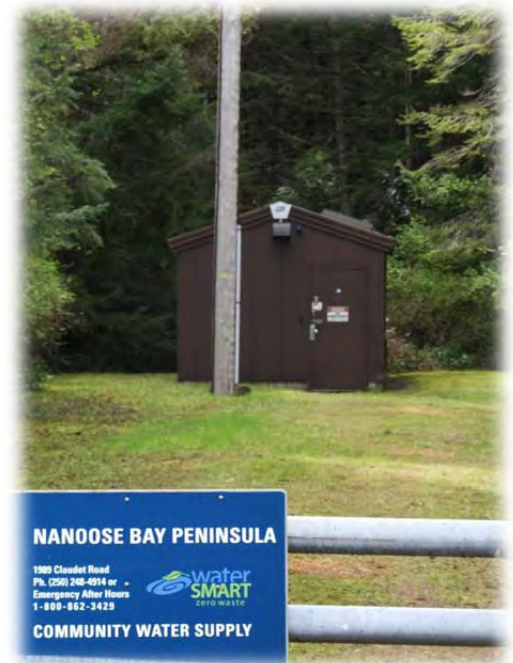
7. Maintenance Program

Weekly pump station inspections are carried out to reduce or eliminate the risk of contamination and system failure, and to ensure the consistent application of chlorine for treatment purposes. Watermains are flushed once annually in the Spring. Fire hydrants are serviced once per year (either ‘A-level’ or ‘B-level’ maintenance). Water storage reservoirs are drained and cleaned once every 3-4 years, as required. Twenty-four hour on-call coverage is in place to respond to water system emergencies and alarms.

8. Water System Projects

8.1 2015 Completed Studies & Projects

- Demolished the Beachcomber reservoir;
- Continued the Parker Road well monitoring program;
- Completed the Development Cost Charge (DCC) bylaw;
- Finalized updates to the Capital Charge bylaw;
- Upgraded watermain and PRV on Garry Oak Drive;
- Upgraded watermains on Spruce Lane, Hemlock Drive, and Ashcraft Road;
- Completed annual watermain flushing;
- Authorized water bill rebates under the RDN Leak Policy;
- Updated the water services asset database to reflect system growth;
- Updated Standard Operating Procedures;
- Updated the Emergency Response Plan;
- Enforced the outdoor sprinkling regulations;
- Carried out a comprehensive water conservation campaign (Team WaterSmart);
- Updated and improved the RDN website at www.rdn.bc.ca;
- Utilized the Auto E-message service to notify member residents of water service disruptions and upcoming maintenance activities;
- Applied a rainwater harvesting incentive (rain barrels);
- Offered free irrigation audits to high water users;
- Updated confined space entry training and purchased additional safety equipment;
- Maintained excellent customer complaint and service request response times;
- Continued quality control through regular testing and monitoring of our water systems; and
- Completed additional educational programs.



Nanoose Well #2 and Pumphouse

8.2 2016 Proposed Projects & Upgrades

- Update the Emergency Response Plans for the water system and for the water filtration plant (2 separate documents);
- Finalize water storage calculations and requirements;
- Complete watermain upgrades on McDivitt Drive and Schirra Drive;
- Complete well rehabilitation of Madrona Well #8;
- Design and install pump station upgrades in Arbutus Park subdivision;
- Finalize the Nanoose Bay Peninsula Water Service Area Capital Charge bylaw;
- Continue to offer a rainwater harvesting (rain barrel) incentive;
- Continue to offer free irrigation audits to high water users; and
- Complete additional educational programs.

9. **Emergency Response Plan**

The Regional District has an Emergency Response Plan (ERP) that contains procedures and contact information to efficiently respond to water system emergencies such as contamination of water supply, loss of supply, and pump failure. The ERP was reviewed and updated in 2015, and copies are available on our website, at each RDN office, in each pumphouse, and in each Water Services vehicle. A copy of the ERP is also attached to this report in Appendix C.

A separate Emergency Response Plan was developed exclusively for the water filtration plant at 2480 Nanoose Road. A copy of this ERP is located at the plant, at each RDN office and on the RDN website.

10. **Cross Connection Control**

In 2012, *Regional District of Nanaimo Water Use Regulation Bylaw No. 1654* was adopted which includes enhanced cross connection control and backflow protection wording. A separate Cross Connection Control bylaw was deemed not to be required.

A database of commercial customers was set-up in order to keep track of the maintenance history of testable backflow prevention assemblies at each site. Two RDN Operators achieved their Backflow Prevention Tester re-certification in 2015.

11. Closing

An annual report for the year 2016 will be prepared and submitted to Island Health in the Spring of 2017. Annual reports are also available on our website at www.rdn.bc.ca in the SERVICES section, under “Water Services” then “WaterSmart Communities”.



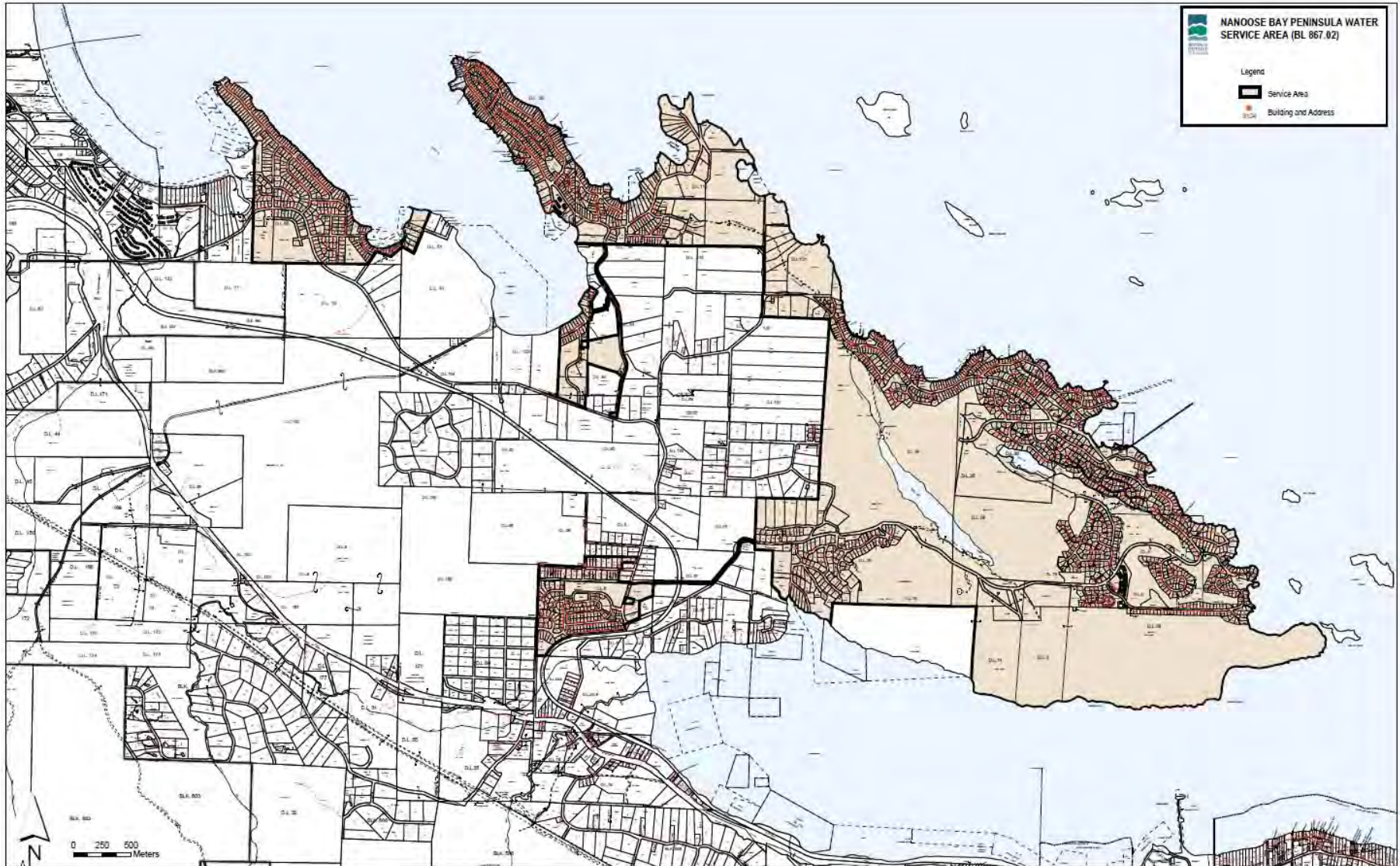
Arrowsmith Dam
April 2014

APPENDIX A

MAP OF NANOOSE BAY PENINSULA

WATER SERVICE AREA

NANOOSE BAY PENINSULA WATER SERVICE AREA



APPENDIX B

WATER QUALITY TESTING RESULTS