City of Parksville

2014 Annual Water Report

April 2015

CITY OF PARKSVILLE

1116 Herring Gull Way
Parksville, BC
V9P 1R2

Phone: 250-248-5412
Fax: 250-248-6140

Table of Contents

1.0 Introduction

All water suppliers, under their Operating Permit and conditions, are required to provide an annual report to their users with information such as explanation of water source, water test results, maintenance programs and improvements to the water system. The following document summarizes these requirements. City of Parksville operating conditions are shown in Appendix F.

This report has been submitted to Island Health and it can be found on the City of Parksville Website. www.Parksville.ca.

2.0 Parksville Water System

The City of Parksville has approximately 4,500 water connections serving over 11,000 permanent and seasonal residents as well as supplying water to the Regional District of Nanaimo (Nanoose Bay Peninsula system) in the summer months.

These users get their drinking water from three sources.

- Englishman River Intake
- Springwood Well Field
- Railway Well Field

The water is treated using either liquid or gaseous chlorine and stored in four reservoirs at both ends of the City.

Railway Well being removed for repairs

2.1 Groundwater Wells

The City's groundwater is pumped from a confined quadra sands aquifer that runs underground alongside the railway tracks from Trill Drive to the City's boundary in the southwest. The City currently has 16 production wells ranging from 2.0 l/s (25.23 IGPM) to 8.6 l/s (113.5 IGPM). See **Appendix A** for Well locations.

Well Name	Well Depth (m)	Production (l/s, Igpm)
Springwood Well #1	25.8	2.3, 30.4
Springwood Well #2	-	-
Springwood Well #3	25.0	3.6, 47.5
Springwood Well #4	9.8	-
Springwood Well #5	30.2	5.4, 71.3
Springwood Well #6	30.2	2.7, 35.6
Springwood Well #7	40.2	3.3, 43.5
Springwood Well #8	38.4	8.6, 113.5
Springwood Well #10	26.0	5.5, 72.6
Springwood Well #11	27.7	6.4, 84.5
Railway Well#1	30.7	3.8, 50.1
Railway Well#2	32.28	4.2, 55.4
Railway Well#3	25.23	2.0, 26.4
Railway Well#4	22.5	2.9, 38.3
Railway Well#5	35.9	7.6, 100.3
Railway Well#6	36.0	7.5, 99
Railway Well#7	37.4	2.7, 35.6
Railway Well #8	28.6	3.8, 50.1
Trill Well#8	25.1	-

Well Depth and Production Information

2.2 River Intake

Between May and October the City pumps water from the Englishman River at a maximum rate of 105 l/s (1390 IGPM) to keep up with summer demands. The water in the Englishman river is partially supplied from the Arrowsmith Dam. The Ministry of Environment, Fisheries and The Arrowsmith Water Service (AWS) developed an operating rule curve in an effort to conserve reservoir storage water for critical fisheries rearing periods. A minimum flow is released into the river based on this curve between June 1st and October 31st.

2.3 Arrowsmith Dam

The City of Parksville, The Regional District of Nanaimo, and The Town of Qualicum are partners in the Arrowsmith Water Service (AWS). A concrete gravity dam is located at Arrowsmith Lake approximately 19km south of Parksville. It was commissioned in September of 2000. The dam has a capacity of 9,000,000 m^3 and is operated and maintained by City of Parksville staff. Water is released to the Englishman river through two pipes, a 900 mm and a 600 mm with flows and lake levels monitored by the City's Supervisory Control and Data Acquisition (SCADA) system.

See **Appendix B** for Arrowsmith Dam Lakes Levels 2014.

2.4 Reservoirs

Water that has been pumped either from the ground or from the river is stored in four reservoirs. Reservoirs numbers 1, 2 and 4 are located in the Springwood Water Compound on Despard Road. These three are concrete with two being partially below ground and one above. Storage capacities are:

- Reservoir #1 - 616 m^3 (135,500 Imp. gal).
- Reservoir #2 - 2023 m^3 (445,000 Imp. gal)
- Reservoir #4 - 4559 m^3 (1,000,000 Imp. gal).

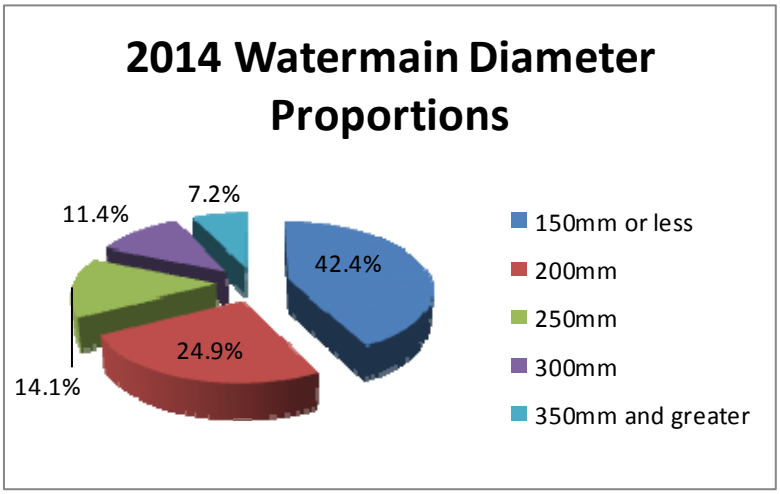
There are two additional reservoirs at the Top Bridge Park area, numbers 3 and 5. Reservoir #5 is a glass fused steel tank, Reservoir #3 is a steel tank although currently not in use. Storage capacities are:

- Reservoir #3 - 671m^3 (148,000 Imp. gal.)
- Reservoir #5 - 4300 m^3 (950,000 Imp. gal).

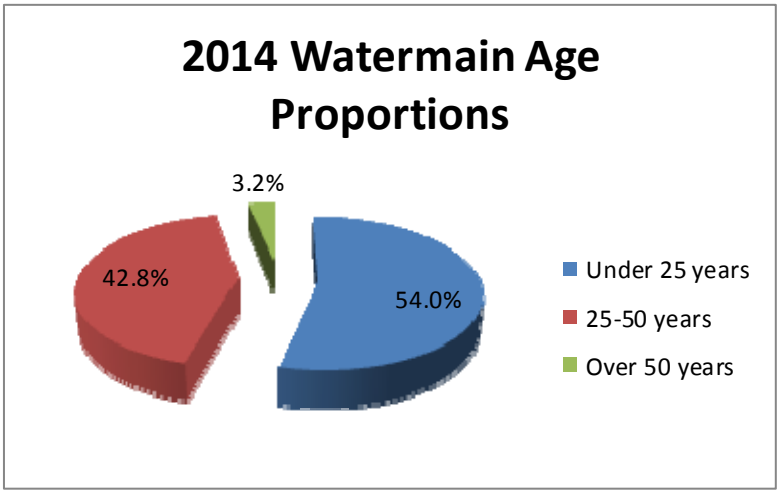
3.0 Distribution System

The distribution system consists of 59.6 km of PVC (plastic) pipe, 8.7 km of Ductile Iron pipe and 27.9 km of AC (Asbestos Cement) pipe. Sizes range from 100mm (4") to 400mm (16").
There are 548 fire hydrants and one Pressure Reducing Valve (PRV).

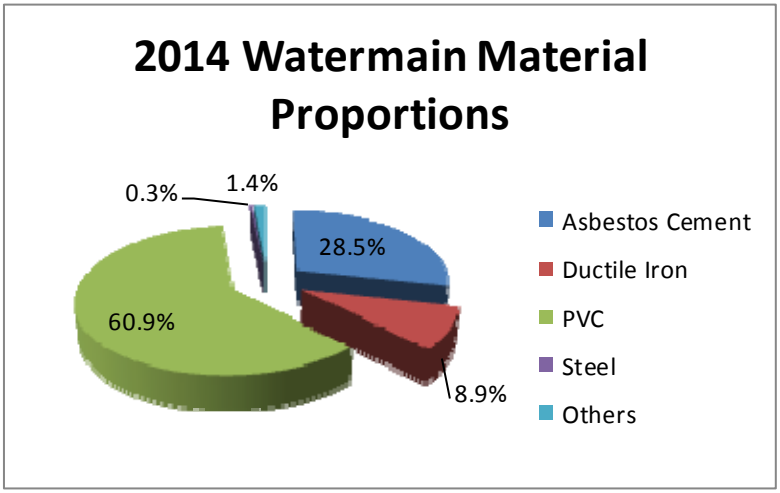
Like all municipalities, the infrastructure is aging and water mains are being replaced through capital improvements and development. The following shows the size, age and material of the mains in the Parksville Water System in 2014. Some of these pipes have been replaced since 2014 but newer data has not yet been updated by the Engineering department.



2014 Watermain Diameter Proportions				
Diameter	**No Pipes**	**Distance (km)**	**Percentage**	**Type**
150 mm or less	676	41.49	42.4%	Distribution Mains 67.3%
200 mm	457	24.38	24.9%	
250 mm	226	13.77	14.1%	Supply Mains 32.7%
300 mm	167	11.10	11.4%	
350 mm and greater	103	7.06	7.2%	
Total:	1629	=97.8	km	



2014 Watermain Age Proportions			
Age	**No Pipes**	**Distance (km)**	**Percentage**
Under 25 Years (≥1990)	920	52.8	54%
25 - 50 Years (1965 - 1990)	526	41.9	42.8%
Over 50 Years (<1965)	48	3.1	3.2%
Total:	1629	97.8	km



2014 Watermain Material Proportions		
Material Types	**Distance (km)**	**Percentage**
Asbestos Cement	27.9	28.5%
Ductile Iron	8.7	8.9%
PVC	59.6	59.6%
Steel	0.32	0.3%
Others	1.32	1.4%
Total:	97.84	m

3.1 Pressure Zones

The City is divided into two pressure zones. A low pressure and a high pressure. The low pressure is a gravity fed system based on the elevation of Reservoir #4 and Reservoir #5. A top water level of 73.74m above sea level (geodetic) gives a range of 55 psi to 85 psi throughout the system, depending on the geographic location.

The high pressure system initially was developed for higher elevation regions of the city that didn't have sufficient pressures or flows to meet fire fighting flows. This high pressure zone has been expanded to areas furthest from the pump stations that lose pressure and flow due to line losses. In order to maintain a balance between high and low pressures but still keep a safe pressure in the lower areas, a PRV was installed to drop the pressure from 80psi to 60psi.

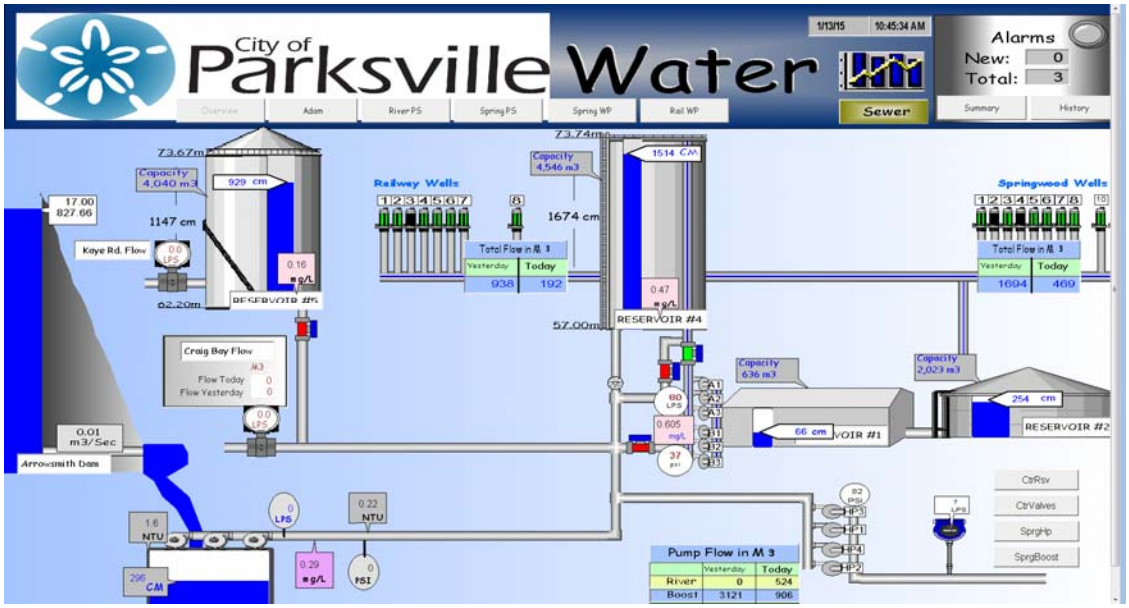
The high pressure water in this zone is supplied from four pumps, a 15hp, 2-40hp and a 100 hp. These pumps are controlled through the SCADA system that automatically watches flows and switches on however many pumps it needs to meet the flow requirements.

See **Appendix C** for Map of Pressure Zone Boundaries.

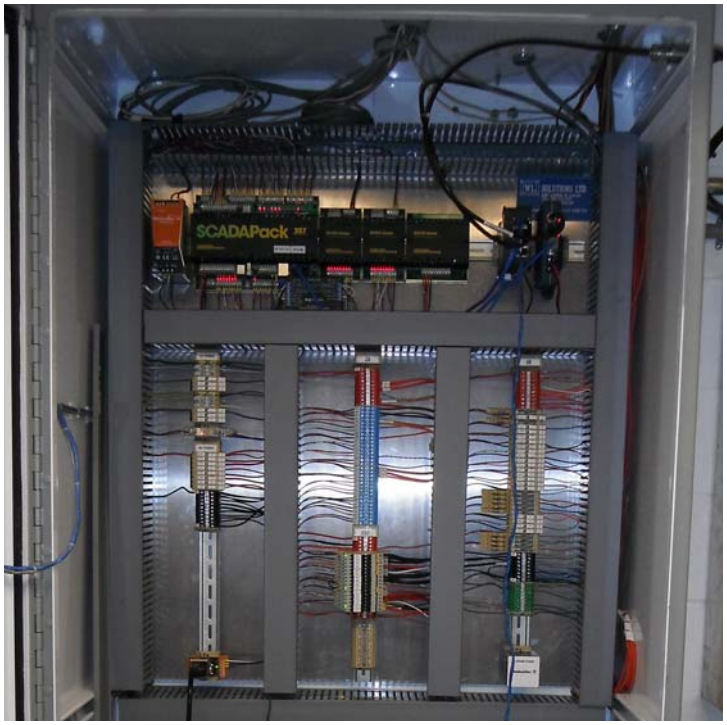
Springwood Pump Station

4.0 SCADA (Supervisory Control and Data Acquisition)

The water system and sewer pump stations are controlled by a computerized control system called SCADA. This system allows the Operators to monitor reservoir levels, the status and flows of pumps, and monitor chlorine residuals. The operator can change set points and monitor the system remotely. Alarms are automatically called out to City staff that monitors the system 24 hours a day, 7 days a week.



SCADA system



5.0 Water Sampling and Testing

5.1 Bacteriological

As required by the Island Health, City staff take weekly bacteriological samples to be tested for Total Coliforms and e-Coli Bacteria. There are 16 dedicated sampling sites throughout the city.

See **Appendix D** for 2014 test results (L1 means Less than 1 - no detectable bacteria - Acceptable)

5.2 Full Spectrum Analysis

In addition to weekly sampling throughout the distribution system, the City also sends samples from the source waters once per year, in the Fall, for a full spectrum analysis. As seen in Appendix E, parameters such as metals (iron, manganese) conventional parameters (pH, Turbidity, Hardness) and disinfection byproducts (Trihalomethane) are tested.

The source water is aesthetically acceptable as set by the "Guidelines for Canadian Drinking Water Summary Table". Aesthetic qualities apply to certain substances or characteristics such as high Iron content which will stain fixtures red or Manganese which will stain black.

Hardness in the water comes from calcium carbonate (CaCO3). The river water is considered "Soft" under the guidelines and the Well water is "Moderate". Hardness levels above 500 mg/l are normally considered unacceptable.

All parameters meet the Canadian Drinking Water Guidelines.

See **Appendix E** for the 2014 Full Spectrum Analysis of the Parksville Water System Source Water. Note: The water tested is in it's Raw form before any type of treatment.

Dedicated sampling site

6.0 Water Quality Complaints & Incidents

The Operations Department had a few water quality complaints throughout 2014. During periods of high flows (summer months) or during water main flushing and fire hydrant maintenance there were a few calls related to "brown or dirty" water. One of these complaints was on a dead end line. City of Parksville crews would either reflush the mains through a hydrant or flushout at a location closest to the dead end or advise the homeowner that running an outside tap for a few minutes would clear up the problem.

There were occasional complaints about the taste of chlorine in the water. Chlorine residuals are tested weekly throughout the system and are kept at a safe level. Besides recommending a filter to remove the chlorine within the home, not much can be done about it.

There were a few hardness related complaints mostly contributed to new homeowners from other municipalities who are used to different water composition. There were also a few calls concerning build up in washing machines and dishwashers although the water is only considered "Moderately Hard" on the Hardness Scale. This rating drops throughout the summer when the river supply (soft water) is mixed with the well supply.

Most of the complaints in 2014 were related to pressure drop. The cause for most of the pressure drop complaints were from a faulty PRV (responsibility of the home owner).

Parksville—Fire Hydrant

Clay Bank at Englishman River

7.0 Englishman River Water Service Joint Venture Agreement

In June 2011, the partners in the Arrowsmith Water Service (AWS) renewed a revised AWS joint venture agreement. The agreement now addresses governance and funding of the bulk water service without referencing participation in the next phase of capital infrastructure. This change addresses Qualicum Beach's interest in not wishing to cost share in the water intake, treatment plant and distribution infrastructure at this time.

Voting of the AWS management board follows a weighted vote system rather than a unanimous vote system to better reflect a governance model that is similar to a regional district governance structure.

The Englishman River Water Service joint venture agreement parallels and complements the Arrowsmith Water Service joint venture agreement; it has only the City of Parksville and the Regional District of Nanaimo as joint venture participants.

The Englishman River Water Service joint venture agreement describes the infrastructure (intake and treatment plant) that will be cost shared by its two joint venture participants, and contains language that gives the option for the Town of Qualicum Beach to join the agreement in the future. While the Town of Qualicum Beach would not be a signatory to the Englishman River joint venture agreement, under the AWS Agreement the town would have the option to "buy in" to this infrastructure at a future date. Qualicum Beach would have the right to do so due to the rights it possesses as a joint venture partner on the AWS water licence for the Englishman River and as joint owner of the Arrowsmith Lake dam and related infrastructure.

Englishman River Water Service joint venture agreement (percentages of interest).

- City of Parksville 74%
- Regional District of Nanaimo 26%

For more information visit
www.arrowsmithwaterservice.ca

englishman river
WATER SERVICE

8.0 Routine Maintenance Program

8.1 Distribution

- Water mains are flushed using a unidirectional flushing program
- Air relief valves are cleaned
- Fireline meters are cleaned
- Fire Hydrants are completely disassembled and inspected on a two year rotation
- Paint and brush out around hydrants as needed
- All irrigation backflow prevention devices tested and repaired if needed

8.2 Wells

- Daily security check of all wells
- Rehabilitation of 1-2 wells per year
- Pumps and motors replaced as necessary
- Filling chlorine tank on Springwood Well #1 as needed
- Annual water sampling

Springwood Well #6

8.3 River Intake

- Winter maintenance of chlorination system while off line
- Weekly blowing of air lines through intake screens
- Daily checks of pump flows and chlorine levels
- Monthly calibration of turbidity analyzers

8.4 Reservoirs

- Daily security check of tanks and compounds
- Yearly cleaning of Reservoir #1 and 2.
- Clean Reservoir #4 and 5 using divers every 5 years.
- Sustaining valves cleaned monthly


Inside of Reservoir #5

8.5 Pump Stations

- Daily checks of pumps and chlorination system
- Security checks of compounds
- Bi-Annual calibration of chlorine analyzers and turbidimeters

9.0 2014 Improvements

- Rebuilt 40 HP pump/motor at Springwood pump station.
- Cross Connection Control program was reintroduced.
- Springwood Well#2 abandoned.
- Replaced most 2” meters
- Installed new communication tower at PW yard.
- Installed a water meter at the sports field at Springwood Park.
- Updated all water meter route maps.
- Updated Operations and Maintenance Manual for the Arrowsmith Dam (Volume I and II).
- Updated the Water Systems Emergency Response Plan.
- Replaced motor on Railway wells 2, 3 and 8 and Springwood well 8.
- Ackerman mainline loop at Highway 19A though Stanhope corridor.

10.0 2014 Capital Projects

- ASR well #2—In Progress.
- Completed the Arrowsmith Dam Inundation Study.
- Replaced water main on Highway 19A from Rushton to Finholm.

11.0 2015 Projects & Improvements

- Continuing the water meter replacement program.
- Continuing to replace aging water mains for better distribution (Banks, Forsyth and Temple Street upgrade).
- Continue developing the Cross Connection Control Program.
- Update flushing maps
- Complete the Arrowsmith Dam Emergency Response Plan

New communication tower

Springwood Well #2 abandonment

40HP pump/motor at Springwood

12.0 Cross Connection Control Program

Double Check Valve Assembly

In 2006 the City of Parksville drafted a cross connection control program. Due to shortage of staff, the program was not able to be properly conducted until 2014. Currently, the Utilities Technician is working on the implementation of this program.

The Cross Connection program is addressing high and severe hazard water use processes first. These include Industrial, Commercial and Institutional (ICI) users. Each ICI user will be assessed as to the potential risk to the water system. Any costs associated with installation, replacement and testing of an approved backflow device will have to be covered by the property owner.

A tracking program called FAST is used to track devices around the City (both City owned and privately owned devices). Property owners are required to send the annual test to the Utilities Technician at the City of Parksville.

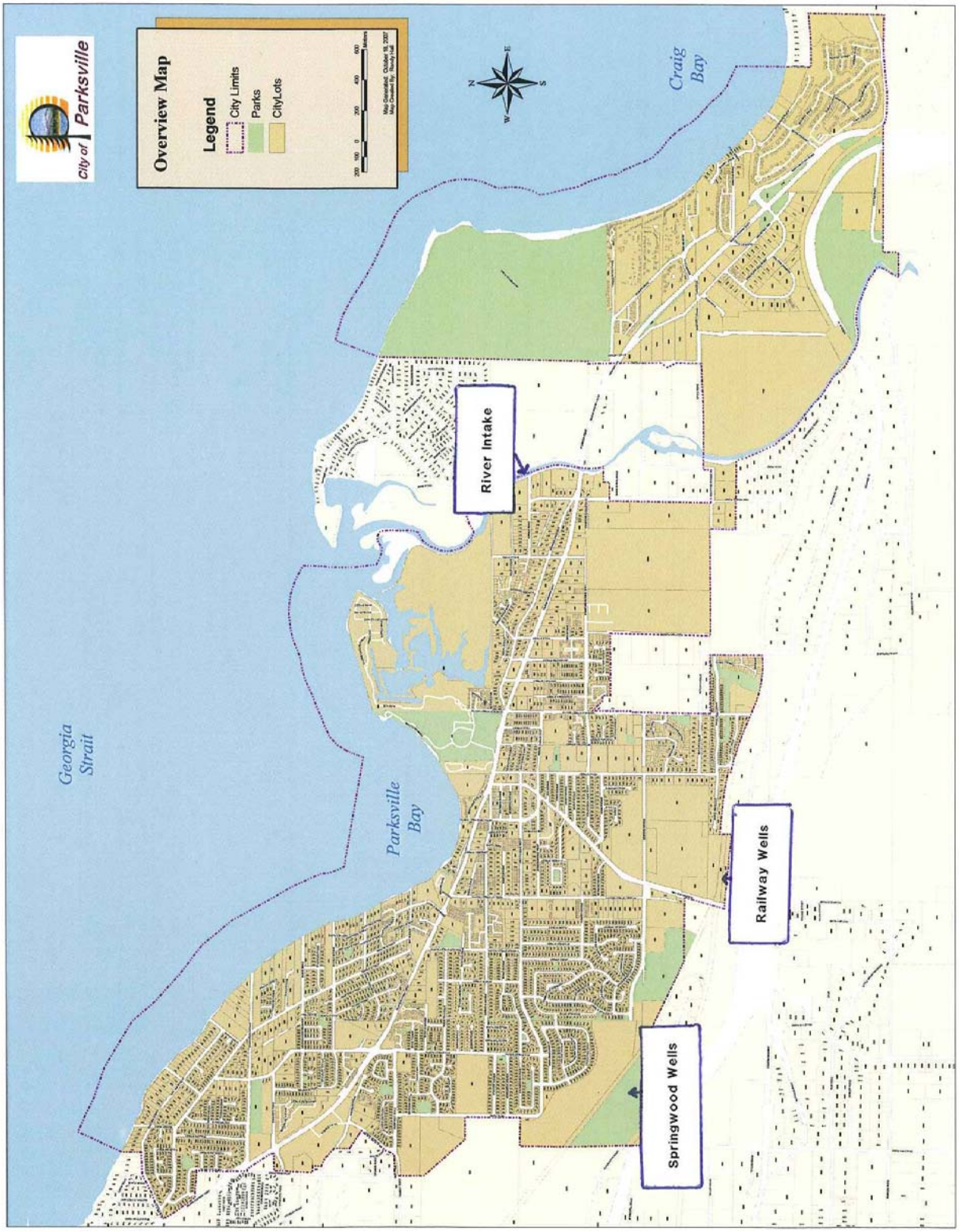
All City owned facilities were assessed and the appropriate backflow preventer were installed. Currently staff is assessing privately owned devices. Due to the large number of ICI users, this assessment may take a couple of years. City staff remains watchful of potential cross connections around the City, and problems are reported to the Utilities Technician, the individual in charge of the Cross Connection Control Program.

13.0 Emergency Response Plan

The City of Parksville has an Emergency Response Plan (ERP) pertaining to the water system available for public viewing at the Operations Department. This document outlines the strategies to deal with events such as contamination of water supply, pump failures and turbidity events. This plan was updated in 2014 and a separate ERP is being created for the Arrowsmith Dam.

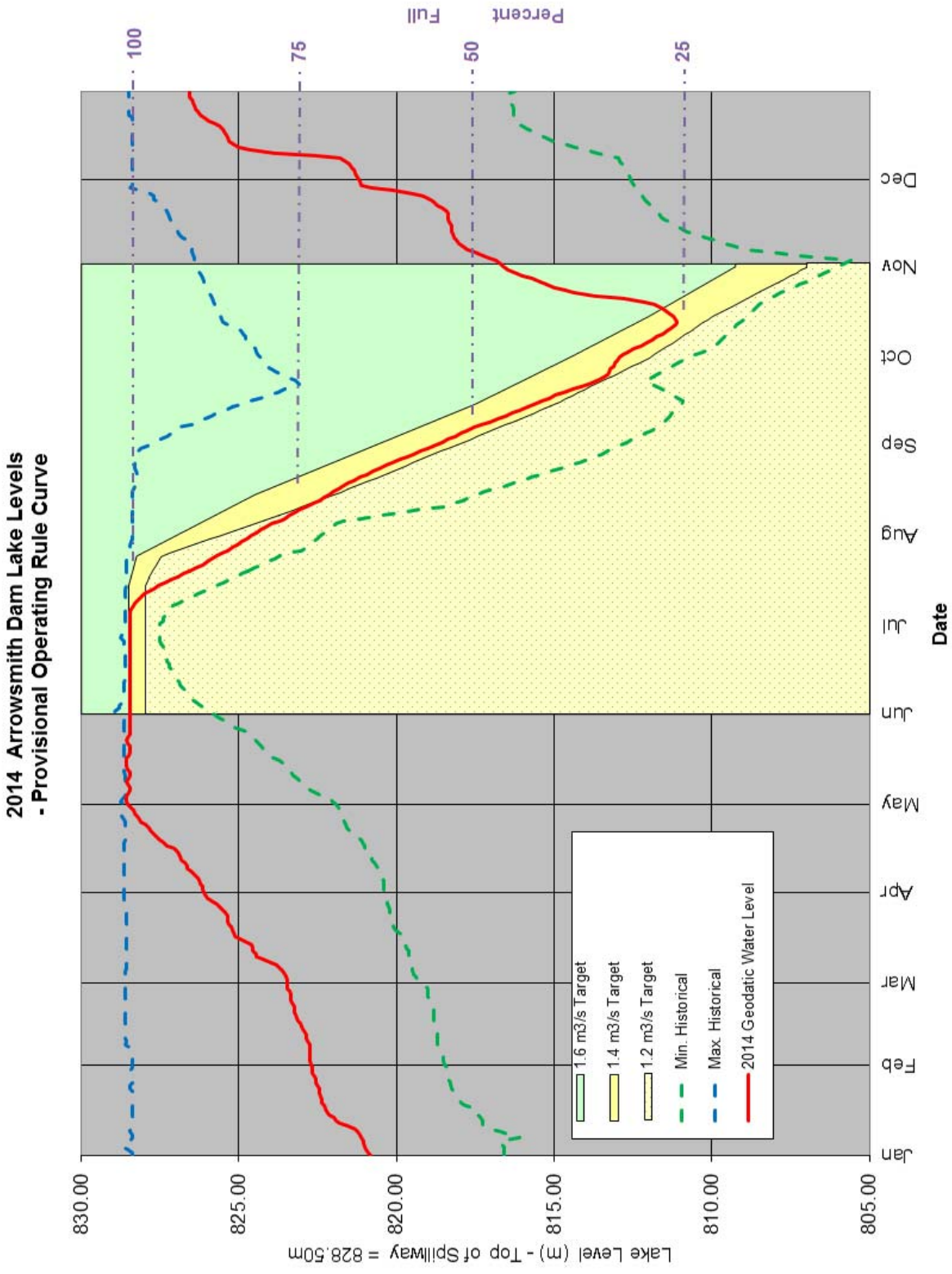
Clay Bank at Englishman River

Appendix A



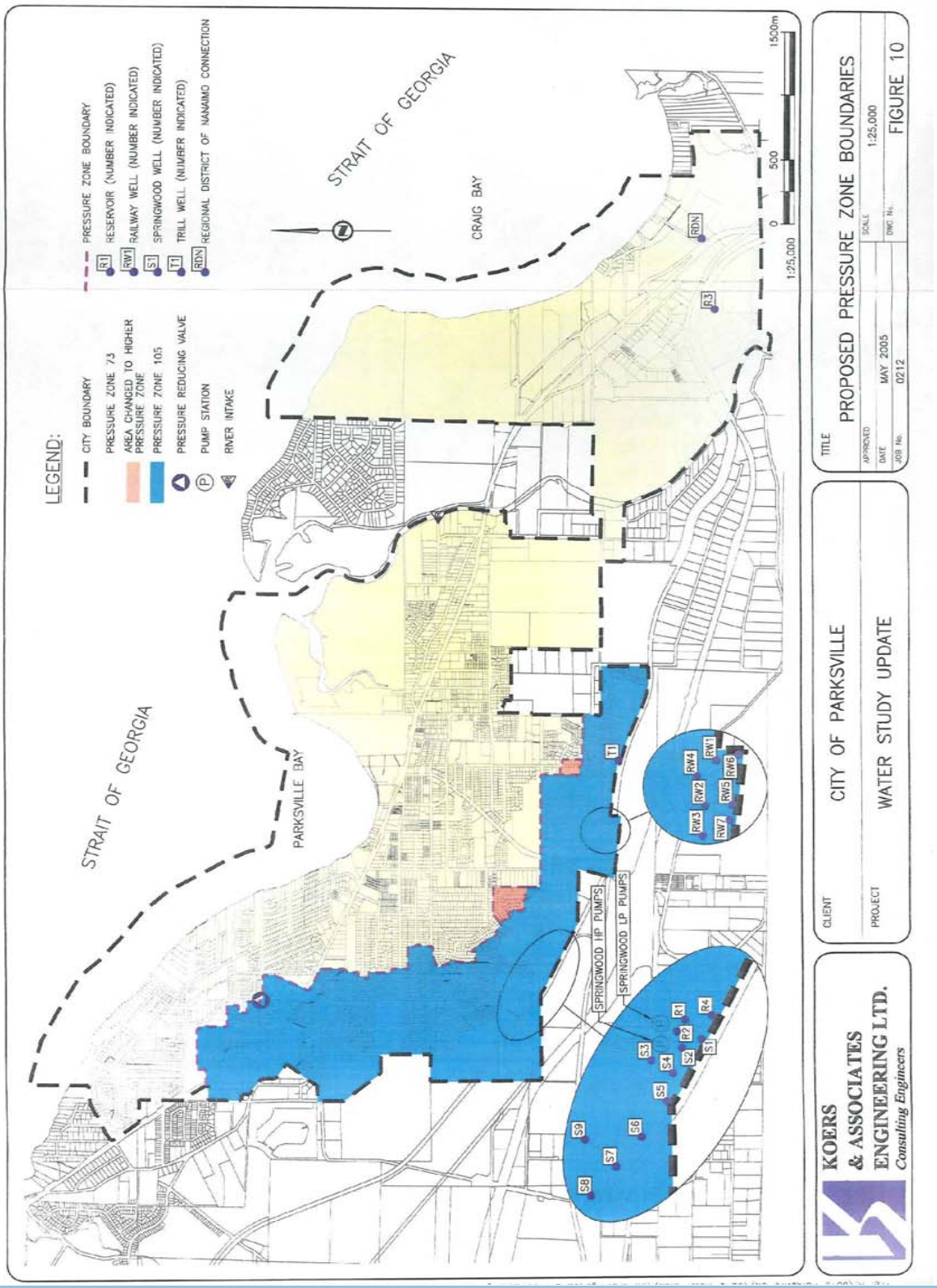
Water Source Locations Map

Appendix B



Arrowsmith Dam Lake Levels

Appendix C



Map of Pressure Zone Boundaries

Appendix D

PARKSVILLE, WWS

Facility Location:
1116 Herring Gull Way
Parksville

Facility Information:
Facility Type: DWT

Facility Sampling History:

Location	Date	Total Coliform	E. Coli
136 Memorial, 136 Memorial	16-Dec-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	16-Dec-2014	L1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	16-Dec-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	16-Dec-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	16-Dec-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	9-Dec-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	9-Dec-2014	L1	L1
770 Soriel , 770 Soriel	9-Dec-2014	L1	L1
River Pump Station, Englishman River Intake	9-Dec-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	9-Dec-2014	L1	L1
851 TEMPLE (beside), 851 Temple	2-Dec-2014	L1	L1
across from 450 Wisteria, 450 Wisteria	2-Dec-2014	L1	L1
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	2-Dec-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	2-Dec-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	2-Dec-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	2-Dec-2014	L1	L1
136 Memorial, 136 Memorial	26-Nov-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	26-Nov-2014	L1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	26-Nov-2014	L1	L1
River Pump Station, Englishman River Intake	26-Nov-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	19-Nov-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	19-Nov-2014	L1	L1
770 Soriel , 770 Soriel	19-Nov-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	19-Nov-2014	L1	L1
across from 450 Wisteria, 450 Wisteria	12-Nov-2014	L1	L1
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	12-Nov-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	12-Nov-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	12-Nov-2014	L1	L1
851 TEMPLE (beside), 851 Temple	4-Nov-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	4-Nov-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	4-Nov-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	4-Nov-2014	L1	L1
136 Memorial, 136 Memorial	29-Oct-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	29-Oct-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	29-Oct-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	29-Oct-2014	L1	L1
River Pump Station, Englishman River Intake	29-Oct-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	21-Oct-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	21-Oct-2014	L1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	21-Oct-2014	L1	L1
across from 450 Wisteria, 450 Wisteria	14-Oct-2014	L1	L1
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	14-Oct-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	14-Oct-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	14-Oct-2014	L1	L1
770 Soriel , 770 Soriel	7-Oct-2014	L1	L1
851 TEMPLE (beside), 851 Temple	7-Oct-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	7-Oct-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	7-Oct-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	30-Sep-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	30-Sep-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	30-Sep-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	23-Sep-2014	L1	L1
770 Soriel , 770 Soriel	23-Sep-2014	L1	L1

Appendix D

Location	Date	Total Coliform	E. Coli
River Pump Station, Englishman River Intake	23-Sep-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	16-Sep-2014	L1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	16-Sep-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	16-Sep-2014	L1	L1
851 TEMPLE (beside), 851 Temple	9-Sep-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	9-Sep-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	9-Sep-2014	L1	L1
136 Memorial, 136 Memorial	2-Sep-2014	L1	L1
across from 450 Wisteria, 450 Wisteria	2-Sep-2014	L1	L1
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	2-Sep-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	2-Sep-2014	L1	L1
136 Memorial, 136 Memorial	26-Aug-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	26-Aug-2014	L1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	26-Aug-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	26-Aug-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	19-Aug-2014	L1	L1
770 Soriel , 770 Soriel	19-Aug-2014	L1	L1
851 TEMPLE (beside), 851 Temple	19-Aug-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	19-Aug-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	12-Aug-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	12-Aug-2014	L1	L1
River Pump Station, Englishman River Intake	12-Aug-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	12-Aug-2014	L1	L1
across from 450 Wisteria, 450 Wisteria	6-Aug-2014	L1	L1
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	6-Aug-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	6-Aug-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	6-Aug-2014	L1	L1
136 Memorial, 136 Memorial	29-Jul-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	29-Jul-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	22-Jul-2014	L1	L1
851 TEMPLE (beside), 851 Temple	22-Jul-2014	L1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	22-Jul-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	15-Jul-2014	L1	L1
770 Soriel , 770 Soriel	15-Jul-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	15-Jul-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	8-Jul-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	8-Jul-2014	L1	L1
River Pump Station, Englishman River Intake	8-Jul-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	8-Jul-2014	L1	L1
across from 450 Wisteria, 450 Wisteria	2-Jul-2014	L1	L1
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	2-Jul-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	2-Jul-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	2-Jul-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	24-Jun-2014	L1	L1
770 Soriel , 770 Soriel	24-Jun-2014	L1	L1
851 TEMPLE (beside), 851 Temple	24-Jun-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	24-Jun-2014	L1	L1
136 Memorial, 136 Memorial	17-Jun-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	17-Jun-2014	L1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	17-Jun-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	17-Jun-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	10-Jun-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	10-Jun-2014	L1	L1
River Pump Station, Englishman River Intake	10-Jun-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	10-Jun-2014	L1	L1

2014 Bacteriological Results

Appendix D

Location	Date	Total Coliform	E. Coli
across from 450 Wisteria, 450 Wisteria	3-Jun-2014	L1	L1
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	3-Jun-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	3-Jun-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	3-Jun-2014	1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	27-May-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	27-May-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	27-May-2014	L1	L1
River Pump Station, Englishman River Intake	27-May-2014	L1	L1
136 Memorial, 136 Memorial	20-May-2014	L1	L1
across from 450 Wisteria, 450 Wisteria	20-May-2014	L1	L1
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	20-May-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	20-May-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	13-May-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	13-May-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	13-May-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	13-May-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	6-May-2014	L1	L1
770 Soriel , 770 Soriel	6-May-2014	L1	L1
851 TEMPLE (beside), 851 Temple	6-May-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	6-May-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	29-Apr-2014	L1	L1
River Pump Station, Englishman River Intake	29-Apr-2014	L1	L1
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	22-Apr-2014	L1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	22-Apr-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	22-Apr-2014	L1	L1
across from 450 Wisteria, 450 Wisteria	16-Apr-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	15-Apr-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	15-Apr-2014	L1	L1
136 Memorial, 136 Memorial	8-Apr-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	8-Apr-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	8-Apr-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	8-Apr-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	1-Apr-2014	L1	L1
770 Soriel , 770 Soriel	1-Apr-2014	L1	L1
851 TEMPLE (beside), 851 Temple	1-Apr-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	1-Apr-2014	L1	L1
136 Memorial, 136 Memorial	25-Mar-2014	L1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	25-Mar-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	25-Mar-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	25-Mar-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	18-Mar-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	18-Mar-2014	L1	L1
River Pump Station, Englishman River Intake	18-Mar-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	18-Mar-2014	L1	L1
across from 450 Wisteria, 450 Wisteria	10-Mar-2014	L1	L1

2014 Bacteriological Results

Appendix D

Location	Date	Total Coliform	E. Coli
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	10-Mar-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	10-Mar-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	10-Mar-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	5-Mar-2014	L1	L1
770 Soriel , 770 Soriel	5-Mar-2014	L1	L1
851 TEMPLE (beside), 851 Temple	5-Mar-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	5-Mar-2014	L1	L1
136 Memorial, 136 Memorial	25-Feb-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	25-Feb-2014	L1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	25-Feb-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	25-Feb-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	18-Feb-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	18-Feb-2014	L1	L1
River Pump Station, Englishman River Intake	18-Feb-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	18-Feb-2014	L1	L1
across from 450 Wisteria, 450 Wisteria	12-Feb-2014	L1	L1
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	12-Feb-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	12-Feb-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	12-Feb-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	4-Feb-2014	L1	L1
770 Soriel , 770 Soriel	4-Feb-2014	L1	L1
851 TEMPLE (beside), 851 Temple	4-Feb-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	4-Feb-2014	L1	L1
136 Memorial, 136 Memorial	29-Jan-2014	L1	L1
613 Chinook Avenue, Parksville , 613 Chinook Avenue, Parksville BC	29-Jan-2014	L1	L1
Daffodil at Camas, Parksville, Daffodil at Camas, Parksville BC	29-Jan-2014	L1	L1
Despard & Moilliet, 401 S. Moiliet Street, Parksville BC	29-Jan-2014	L1	L1
271 Chestnut Street, Parksville, 271 Chestnut Street, Parksville BC	22-Jan-2014	L1	L1
Island Highway, by Temple, Island Highway, by Temple	22-Jan-2014	L1	L1
River Pump Station, Englishman River Intake	22-Jan-2014	L1	L1
Top of Corfield, Parksville , Harbour Homes, Parksville BC	22-Jan-2014	L1	L1
across from 450 Wisteria, 450 Wisteria	14-Jan-2014	L1	L1
Community Park, Parksville BC, 193 East Island Highway, Parksville BC	14-Jan-2014	L1	L1
Wheeler, Top of Kingsley, 378 Kingsley Street	14-Jan-2014	L1	L1
Works Yard, Parksville, 1390 Herring Gull Way, Parksville BC	14-Jan-2014	L1	L1
330 Park View, Parksville, 330 Park View, Parksville BC	8-Jan-2014	L1	L1
770 Soriel , 770 Soriel	8-Jan-2014	L1	L1
851 TEMPLE (beside), 851 Temple	8-Jan-2014	L1	L1
Parksville MHP/Utility Building, Parksville, 1247 Arbutus Road, Parksville BC	8-Jan-2014	L1	L1

2014 Bacteriological Results

Appendix E

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your P.O. #: 1491
Your C.O.C. #: 002431

Attention:Mike Squire

City of Parksville
Engineering and Operations Dpt
PO Box 1390
Parksville, BC
Canada V9P 2H3

Report Date: 2014/11/17
Report #: R1684612
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4A0219
Received: 2014/11/04, 09:00

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water	5	2014/11/04	2014/11/05	BBY6SOP-00026	SM 22 2320 B m
Chloride by Automated Colourimetry	5	N/A	2014/11/04	BBY6SOP-00011	SM 22 4500-Cl- G m
Colour (True)	5	N/A	2014/11/04	BBY6SOP-00021	SM 22 2120 B m
Total Coliforms & E.coli Potable W- MF	5	N/A	2014/11/04	BBY4SOP-00001	SM 22 9222 m
Conductance - water	5	N/A	2014/11/05	BBY6SOP-00026	SM 22 2510 B m
Fluoride	5	N/A	2014/11/05	BBY6SOP-00048	SM 22 4500-F C m
Hardness Total (calculated as CaCO3)	1	N/A	2014/11/12	BBY7SOP-00002	EPA 6020a R1 m
Hardness Total (calculated as CaCO3)	4	N/A	2014/11/13	BBY7SOP-00002	EPA 6020a R1 m
Mercury (Total) by CVAF	5	2014/11/14	2014/11/15	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2014/11/12	BBY7SOP-00002	EPA 6020A R1 m
Na, K, Ca, Mg, S by CRC ICPMS (total)	4	N/A	2014/11/13	BBY7SOP-00002	EPA 6020A R1 m
Elements by CRC ICPMS (total)	5	N/A	2014/11/12	BBY7SOP-00002	EPA 6020A R1 m
Nitrate + Nitrite (N)	5	N/A	2014/11/05	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrite (N) by CFA	5	N/A	2014/11/05	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrogen - Nitrate (as N)	5	N/A	2014/11/06	BBY6SOP-00010	SM 22 4500-NO3 I m
pH Water (1)	2	N/A	2014/11/04	BBY6SOP-00026	SM 22 4500-H+ B m
pH Water (1)	3	N/A	2014/11/05	BBY6SOP-00026	SM 22 4500-H+ B m
Sulphate by Automated Colourimetry	5	N/A	2014/11/04	BBY6SOP-00017	SM 22 4500-SO42- E m
Total Dissolved Solids (Filt. Residue)	5	2014/11/05	2014/11/07	BBY6SOP-00033	SM 22 2540 C m
Turbidity	5	N/A	2014/11/04	BBY6SOP-00027	SM 22 2130 B m

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Appendix E

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your P.O. #: 1491
Your C.O.C. #: 002431

Attention:Mike Squire

City of Parksville
Engineering and Operations Dpt
PO Box 1390
Parksville, BC
Canada V9P 2H3

Report Date: 2014/11/17
Report #: R1684612
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4A0219
Received: 2014/11/04, 09:00

Encryption Key

Maxxam
17 Nov 2014 11:22:45 -08:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Shanaz Akbar, Project Manager
Email: SAkbar@maxxam.ca
Phone# (604) 734 7276

This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Appendix E

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B4A0219
Report Date: 2014/11/17

City of Parksville
Your P.O. #: 1491
Sampler Initials: SC

DRINKING WATER PACKAGE WITH CV HG (WATER)

Maxxam ID		LB0517		LB0518	LB0519		
Sampling Date		2014/11/03 11:10		2014/11/03 11:20	2014/11/03 11:40		
COC Number		002431		002431	002431		
	Units	SPRINGWOOD WELL 8	QC Batch	SPRINGWOOD WELL 11	RAILWAY WELL 4	RDL	QC Batch
ANIONS							
Nitrite (N)	mg/L	<0.0050	7708251	<0.0050	<0.0050	0.0050	7708251
Calculated Parameters							
Total Hardness (CaCO3)	mg/L	159	7706117	132	134	0.50	7706117
Nitrate (N)	mg/L	1.13	7706342	1.38	1.10	0.020	7706342
Misc. Inorganics							
Fluoride (F)	mg/L	0.036	7707808	0.037	0.039	0.010	7707808
Alkalinity (Total as CaCO3)	mg/L	138	7706669	110	107	0.50	7706647
Alkalinity (PP as CaCO3)	mg/L	<0.50	7706669	<0.50	<0.50	0.50	7706647
Bicarbonate (HCO3)	mg/L	169	7706669	134	130	0.50	7706647
Carbonate (CO3)	mg/L	<0.50	7706669	<0.50	<0.50	0.50	7706647
Hydroxide (OH)	mg/L	<0.50	7706669	<0.50	<0.50	0.50	7706647
Anions							
Dissolved Sulphate (SO4)	mg/L	7.13	7706779	5.18	14.2	0.50	7706779
Dissolved Chloride (Cl)	mg/L	16	7706777	22	15	0.50	7706777
MISCELLANEOUS							
True Colour	Col. Unit	<5.0	7707596	<5.0	<5.0	5.0	7707596
Nutrients							
Nitrate plus Nitrite (N)	mg/L	1.13	7708247	1.38	1.10	0.020	7708247
Physical Properties							
Conductivity	uS/cm	326	7706672	296	281	1.0	7706651
pH	pH	7.88	7706673	7.78	7.82	N/A	7706654
Physical Properties							
Total Dissolved Solids	mg/L	186	7707293	190	170	10	7707293
Turbidity	NTU	0.35	7706736	<0.10	0.14	0.10	7706736
Elements							
Total Mercury (Hg)	ug/L	<0.010	7719978	<0.010	<0.010	0.010	7719978
Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	<3.0	7714362	<3.0	<3.0	3.0	7714362
Total Antimony (Sb)	ug/L	<0.50	7714362	<0.50	<0.50	0.50	7714362
Total Arsenic (As)	ug/L	0.17	7714362	0.28	0.22	0.10	7714362
Total Barium (Ba)	ug/L	7.2	7714362	7.3	10.6	1.0	7714362
Total Boron (B)	ug/L	<50	7714362	<50	<50	50	7714362
Total Cadmium (Cd)	ug/L	<0.010	7714362	0.016	<0.010	0.010	7714362
Total Chromium (Cr)	ug/L	<1.0	7714362	<1.0	<1.0	1.0	7714362
RDL = Reportable Detection Limit							

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Appendix E

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B4A0219
Report Date: 2014/11/17

City of Parksville
Your P.O. #: 1491
Sampler Initials: SC

DRINKING WATER PACKAGE WITH CV HG (WATER)

Maxxam ID		LB0517		LB0518	LB0519		
Sampling Date		2014/11/03 11:10		2014/11/03 11:20	2014/11/03 11:40		
COC Number		002431		002431	002431		
	Units	SPRINGWOOD WELL 8	QC Batch	SPRINGWOOD WELL 11	RAILWAY WELL 4	RDL	QC Batch
Total Cobalt (Co)	ug/L	<0.50	7714362	<0.50	<0.50	0.50	7714362
Total Copper (Cu)	ug/L	0.25	7714362	0.43	0.99	0.20	7714362
Total Iron (Fe)	ug/L	55.1	7714362	<5.0	<5.0	5.0	7714362
Total Lead (Pb)	ug/L	<0.20	7714362	<0.20	<0.20	0.20	7714362
Total Manganese (Mn)	ug/L	11.0	7714362	31.6	10.8	1.0	7714362
Total Molybdenum (Mo)	ug/L	<1.0	7714362	<1.0	<1.0	1.0	7714362
Total Nickel (Ni)	ug/L	<1.0	7714362	<1.0	<1.0	1.0	7714362
Total Selenium (Se)	ug/L	<0.10	7714362	0.14	0.39	0.10	7714362
Total Silicon (Si)	ug/L	12800	7714362	14000	12800	100	7714362
Total Silver (Ag)	ug/L	<0.020	7714362	<0.020	<0.020	0.020	7714362
Total Uranium (U)	ug/L	0.26	7714362	<0.10	0.18	0.10	7714362
Total Vanadium (V)	ug/L	<5.0	7714362	<5.0	<5.0	5.0	7714362
Total Zinc (Zn)	ug/L	<5.0	7714362	<5.0	<5.0	5.0	7714362
Total Calcium (Ca)	mg/L	35.5	7706341	30.8	30.5	0.050	7706341
Total Magnesium (Mg)	mg/L	17.1	7706341	13.4	14.0	0.050	7706341
Total Potassium (K)	mg/L	0.955	7706341	0.760	0.684	0.050	7706341
Total Sodium (Na)	mg/L	7.04	7706341	8.58	7.02	0.050	7706341
Total Sulphur (S)	mg/L	<3.0	7706341	<3.0	5.1	3.0	7706341
Microbiological Param.							
E. coli	CFU/100mL	<1	7706403	<1	<1	1	7706403
Total Coliforms	CFU/100mL	<1	7706403	<1	<1	1	7706403
RDL = Reportable Detection Limit							

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Appendix E

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B4A0219
Report Date: 2014/11/17

City of Parksville
Your P.O. #: 1491
Sampler Initials: SC

DRINKING WATER PACKAGE WITH CV HG (WATER)

Maxxam ID		LB0520	LB0521		
Sampling Date		2014/11/03 11:30	2014/11/03 01:15		
COC Number		002431	002431		
	Units	RAILWAY WELL 7	ENGLISHMAN RIVER	RDL	QC Batch
ANIONS					
Nitrite (N)	mg/L	<0.0050	<0.0050	0.0050	7708251
Calculated Parameters					
Total Hardness (CaCO3)	mg/L	221	20.3	0.50	7706117
Nitrate (N)	mg/L	1.82	0.032	0.020	7706342
Misc. Inorganics					
Fluoride (F)	mg/L	0.033	0.014	0.010	7707808
Alkalinity (Total as CaCO3)	mg/L	164	16.0	0.50	7706669
Alkalinity (PP as CaCO3)	mg/L	<0.50	<0.50	0.50	7706669
Bicarbonate (HCO3)	mg/L	200	19.6	0.50	7706669
Carbonate (CO3)	mg/L	<0.50	<0.50	0.50	7706669
Hydroxide (OH)	mg/L	<0.50	<0.50	0.50	7706669
Anions					
Dissolved Sulphate (SO4)	mg/L	5.24	<0.50	0.50	7706779
Dissolved Chloride (Cl)	mg/L	52	4.5	0.50	7706777
MISCELLANEOUS					
True Colour	Col. Unit	<5.0	15.0	5.0	7707596
Nutrients					
Nitrate plus Nitrite (N)	mg/L	1.82	0.032	0.020	7708247
Physical Properties					
Conductivity	uS/cm	483	53.5	1.0	7706672
pH	pH	7.96	7.39	N/A	7706673
Physical Properties					
Total Dissolved Solids	mg/L	256	46	10	7707316
Turbidity	NTU	0.18	1.11	0.10	7706736
Elements					
Total Mercury (Hg)	ug/L	<0.010	<0.010	0.010	7719978
Total Metals by ICPMS					
Total Aluminum (Al)	ug/L	<3.0	46.9	3.0	7714362
Total Antimony (Sb)	ug/L	<0.50	<0.50	0.50	7714362
Total Arsenic (As)	ug/L	0.28	0.14	0.10	7714362
Total Barium (Ba)	ug/L	18.7	4.1	1.0	7714362
Total Boron (B)	ug/L	<50	<50	50	7714362
Total Cadmium (Cd)	ug/L	<0.010	<0.010	0.010	7714362
Total Chromium (Cr)	ug/L	<1.0	<1.0	1.0	7714362

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Appendix E

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B4A0219
Report Date: 2014/11/17

City of Parksville
Your P.O. #: 1491
Sampler Initials: SC

DRINKING WATER PACKAGE WITH CV HG (WATER)

Maxxam ID		LB0520	LB0521		
Sampling Date		2014/11/03 11:30	2014/11/03 01:15		
COC Number		002431	002431		
	Units	RAILWAY WELL 7	ENGLISHMAN RIVER	RDL	QC Batch
Total Cobalt (Co)	ug/L	<0.50	<0.50	0.50	7714362
Total Copper (Cu)	ug/L	0.46	0.69	0.20	7714362
Total Iron (Fe)	ug/L	<5.0	54.8	5.0	7714362
Total Lead (Pb)	ug/L	<0.20	<0.20	0.20	7714362
Total Manganese (Mn)	ug/L	5.8	<1.0	1.0	7714362
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	1.0	7714362
Total Nickel (Ni)	ug/L	<1.0	<1.0	1.0	7714362
Total Selenium (Se)	ug/L	<0.10	<0.10	0.10	7714362
Total Silicon (Si)	ug/L	12200	3380	100	7714362
Total Silver (Ag)	ug/L	<0.020	<0.020	0.020	7714362
Total Uranium (U)	ug/L	0.46	<0.10	0.10	7714362
Total Vanadium (V)	ug/L	<5.0	<5.0	5.0	7714362
Total Zinc (Zn)	ug/L	<5.0	<5.0	5.0	7714362
Total Calcium (Ca)	mg/L	47.9	6.62	0.050	7706341
Total Magnesium (Mg)	mg/L	24.5	0.913	0.050	7706341
Total Potassium (K)	mg/L	0.952	0.141	0.050	7706341
Total Sodium (Na)	mg/L	10.7	2.71	0.050	7706341
Total Sulphur (S)	mg/L	<3.0	<3.0	3.0	7706341
Microbiological Param.					
E. coli	CFU/100mL	<1	8	1	7706403
Total Coliforms	CFU/100mL	<1	160	1	7706403
RDL = Reportable Detection Limit					

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Appendix E

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B4A0219
Report Date: 2014/11/17

City of Parksville
Your P.O. #: 1491
Sampler Initials: SC

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.7°C

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B4A0219
Report Date: 2014/11/17

QUALITY ASSURANCE REPORT

City of Parksville
Your P.O. #: 1491
Sampler Initials: SC

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7706403	E. coli	2014/11/04							NC	N/A
7706403	Total Coliforms	2014/11/04							NC	45
7706647	Alkalinity (PP as CaCO3)	2014/11/04					<0.50	mg/L	NC	20
7706647	Alkalinity (Total as CaCO3)	2014/11/04	101	80 - 120	99	80 - 120	<0.50	mg/L	NC	20
7706647	Bicarbonate (HCO3)	2014/11/04					<0.50	mg/L	NC	20
7706647	Carbonate (CO3)	2014/11/04					<0.50	mg/L	NC	20
7706647	Hydroxide (OH)	2014/11/04					<0.50	mg/L	NC	20
7706651	Conductivity	2014/11/04			101	80 - 120	<1.0	uS/cm		
7706654	pH	2014/11/04			102	97 - 103				
7706669	Alkalinity (PP as CaCO3)	2014/11/05					<0.50	mg/L	NC	20
7706669	Alkalinity (Total as CaCO3)	2014/11/05	NC	80 - 120	102	80 - 120	<0.50	mg/L	0.55	20
7706669	Bicarbonate (HCO3)	2014/11/05					<0.50	mg/L	0.55	20
7706669	Carbonate (CO3)	2014/11/05					<0.50	mg/L	NC	20
7706669	Hydroxide (OH)	2014/11/05					<0.50	mg/L	NC	20
7706672	Conductivity	2014/11/05			102	80 - 120	<1.0	uS/cm	0	20
7706673	pH	2014/11/05			102	97 - 103			0.24	N/A
7706736	Turbidity	2014/11/04			101	80 - 120	<0.10	NTU	NC	20
7706777	Dissolved Chloride (Cl)	2014/11/04	99	80 - 120	99	80 - 120	<0.50	mg/L	NC	20
7706779	Dissolved Sulphate (SO4)	2014/11/04	NC	80 - 120	93	80 - 120	<0.50	mg/L	1.6	20
7707293	Total Dissolved Solids	2014/11/07	NC	80 - 120	94	80 - 120	<10	mg/L	3.0	20
7707316	Total Dissolved Solids	2014/11/07	NC	80 - 120	102	80 - 120	<10	mg/L	0.52	20
7707596	True Colour	2014/11/04					<5.0	Col. Unit	NC	20
7707808	Fluoride (F)	2014/11/05	NC	80 - 120	100	80 - 120	<0.010	mg/L	0	20
7708247	Nitrate plus Nitrite (N)	2014/11/05	105	80 - 120	107	80 - 120	<0.020	mg/L	NC	25
7708251	Nitrite (N)	2014/11/05	99	80 - 120	101	80 - 120	<0.0050	mg/L	NC	20
7714362	Total Aluminum (Al)	2014/11/12	108	80 - 120	99	80 - 120	<3.0	ug/L	11	20
7714362	Total Antimony (Sb)	2014/11/12	96	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
7714362	Total Arsenic (As)	2014/11/12	103	80 - 120	98	80 - 120	<0.10	ug/L	NC	20
7714362	Total Barium (Ba)	2014/11/12	103	80 - 120	100	80 - 120	<1.0	ug/L	NC	20
7714362	Total Boron (B)	2014/11/12					<50	ug/L	NC	20
7714362	Total Cadmium (Cd)	2014/11/12	100	80 - 120	100	80 - 120	<0.010	ug/L	NC	20
7714362	Total Chromium (Cr)	2014/11/12	98	80 - 120	95	80 - 120	<1.0	ug/L	NC	20

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B4A0219
Report Date: 2014/11/17

QUALITY ASSURANCE REPORT(CONT'D)

City of Parksville
Your P.O. #: 1491
Sampler Initials: SC

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7714362	Total Cobalt (Co)	2014/11/12	98	80 - 120	94	80 - 120	<0.50	ug/L	NC	20
7714362	Total Copper (Cu)	2014/11/12	99	80 - 120	94	80 - 120	<0.20	ug/L	NC	20
7714362	Total Iron (Fe)	2014/11/12	NC	80 - 120	103	80 - 120	<5.0	ug/L	8.4	20
7714362	Total Lead (Pb)	2014/11/12	94	80 - 120	98	80 - 120	<0.20	ug/L	NC	20
7714362	Total Manganese (Mn)	2014/11/12	115	80 - 120	99	80 - 120	<1.0	ug/L	NC	20
7714362	Total Molybdenum (Mo)	2014/11/12	89	80 - 120	95	80 - 120	<1.0	ug/L	NC	20
7714362	Total Nickel (Ni)	2014/11/12	97	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
7714362	Total Selenium (Se)	2014/11/12	104	80 - 120	98	80 - 120	<0.10	ug/L	NC	20
7714362	Total Silicon (Si)	2014/11/12					<100	ug/L	1.8	20
7714362	Total Silver (Ag)	2014/11/12	96	80 - 120	92	80 - 120	<0.020	ug/L	NC	20
7714362	Total Uranium (U)	2014/11/12	97	80 - 120	99	80 - 120	<0.10	ug/L	NC	20
7714362	Total Vanadium (V)	2014/11/12	99	80 - 120	93	80 - 120	<5.0	ug/L	NC	20
7714362	Total Zinc (Zn)	2014/11/12	110	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
7719978	Total Mercury (Hg)	2014/11/15	91	80 - 120	96	80 - 120	<0.010	ug/L	NC	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Appendix E

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B4A0219
Report Date: 2014/11/17

City of Parksville
Your P.O. #: 1491
Sampler Initials: SC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Andy Lu, Data Validation Coordinator

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Ph: (604) 734-7276 Fax: (604) 731-2386, Toll Free: (800) 665-8566

DRINKING WATER SUBMISSION CHAIN OF CUSTODY RECORD

Maxxam Job #: B4A0219 COC #: 002431 Page: 1 of 1

Invoice To: Require Report? Yes ☑ No ☐

Company Name: City of Parksville
Contact Name: Scott Churko
Address: PO Box 1390, Parksville BC PO: V9P 2H3
Phone / Fax#: Ph: 250-248-5412 Fax: 250-248-6140
E-mail: schurko@parksville.ca

Report To:

Company Name:
Contact Name: Same
Address:
PO:
Ph: Fax:
Phone / Fax#:
E-mail

PO #: 1491
Quotation #: B14-262-ST
Project #:
Proj. Name:
Location:
Sampled by: Scott Churko

SERVICE REQUESTED:

☑ Regular Turn Around Time (TAT) (5 days for most tests)

☐ **RUSH** (Please contact the lab)
☐ 1 Day ☐ 2 Day ☐ 3 Day

Date Required:

SPECIAL INSTRUCTIONS:
Return Cooler ☐ Ship Sample Bottles (please specify) ☐

The BC Drinking Water Protection Act requires Maxxam to immediately give notice to the water supplier, drinking water officer, and medical health officer in the event your sample is positive in E. Coli and if you answered "yes" to any of the questions below. For that reason, Maxxam cannot analyse your sample unless you have completed all information on this form.

Lab Use Only

	Sample Identification	Lab Identification	Water Type	Date/Time Sampled	Drinking Water Package (includes total metals, total coliform & E. coli)	Total Coliform and E. coli	Number of Containers
1	Springwood well 8	LB0517	Raw	14/11/03 11:10	X		4
2	Springwood well 11	LB0518	Raw	14/11/03 11:20	X		4
3	Railway well 4	LB0519	Raw	14/11/03 11:40	X		4
4	Railway well 7	LB0520	Raw	14/11/03 11:30	X		4
5	Englishman River	LB0521	Raw	14/11/03 1:15	X		4
6							

Are the samples from a drinking water source? YES ☒ NO ☐
Does the water source supply multiple households? YES ☒ NO ☐
Are individuals drinking this water? Wells River YES ☒ NO ☐ NO ☒

Please check the region where the samples were collected from:
MHO – Medical Health Officer; **DWO** = Drinking Water Officer

☐ **FRASER HEALTH AUTHORITY**
MHO: 604-527-4806; DWO: 604-870-7900 or 1-866

☒ **VANCOUVER ISLAND HEALTH AUTHORITY**
MHO: 1-800-204-6166; DWO: 250-755-6215

☐ **INTERIOR HEALTH AUTHORITY**
MHO: 1-866-748-1691; DWO: 250-851-7338

☐ **NORTHERN HEALTH AUTHORITY**
MHO: 250-565-7424 or 250-565-2000; DWO: 250-565-2150

☐ **VANCOUVER COASTAL HEALTH AUTHORITY** - check any areas below if applicable
MHO: 604-527-4893; DWO: 604-983-6751

Coast Garibaldi MHO: 604-885-8708 and select one of the DWO below
☐ Powell River: 604-485-3335 ☐ Sechelt Area: 604-885-8711
☐ Sea to Sky (Howe Sound): 604-815-6841 or 604-892-2293 ext. 273

North Shore MHO: 604-983-6751 / 604-983-6813 and select one of the DWO below
☐ Bowen Island, Lions Bay, Bella Bella: 604-904-6200 ext. 1265
☐ Mount Seymour, Indian Arm, Bella Coola, Anahim Lake: 604-904-6457
☐ Grouse Mountain and Municipal Systems: 604-904-6200 ext.1264

B4A0219

Print name and sign

*Relinquished By:	Date (yy/mm/dd):	Time (24hr):	Print name and sign (laboratory use only) Received by:	Date (yy/mm/dd):	Time (24hr):	Time Sensitive	Laboratory Use Only Temperature on Receipt (°C)	Custody Seal	Yes	No	N/A
Scott	14/11/03		REBECCA BANZA	2014/11/04	09:00	☐	A) 8 B) 7 C) 8	Present?	☐	☐	☑
							Just sampled & rec'd on ice: ☐	Intact?	☐	☐	☑

*IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORDS. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

BBY FCD-00077(H) Maxxam Success Through Science ©

Appendix F

VANCOUVER ISLAND health authority

APPENDIX A

WATER SYSTEM OPERATING CONDITIONS FOR

PARKSVILLE, WWS

1116 Herring Gull Way

Parksville, BC, V9P 2H3

1. Compliance with Operating Permit Terms and Conditions do not relieve the operator of other legislated responsibilities and obligations.

2. Water system operators must be familiar with the relevant legislation such as:
   The *Drinking Water Protection Act* , ([SBC 2001] Chapter 9)
   The *Drinking Water Protection Regulation* (B.C. Reg. 200/2003 O.C. 508/2003.

3. The operator must ensure that the water system is in compliance with any and all lawful direction of the Drinking Water Officer. This includes any correspondence to further explain or alter the above operating terms and conditions. Proposed changes to the operating permit initiated by the Drinking Water Officer will allow an opportunity for input by the water supplier as per section 8 of the Act.

The specific terms and conditions are listed below as:

Condition 1.

The water system owner shall provide a residual level of disinfectant within the water distribution system. It is recommended that the level of residual disinfectant measured at any point within the distribution system be at least 0.20 mg/L, measured as *free* chlorine.

The maximum residual disinfectant concentration, measure as *free* chlorine shall not exceed 4.0 mg/L, or as combined chlorine shall not exceed 3.0 mg/L, anywhere in the distribution system. This does not apply in situations where watermains are being superchlorinated during their installation, repair or routine maintenance.

Condition 2.

Conduct a chemical analysis of raw water from each well in accordance with the list of parameters specified in the VIHA Guidelines for Approval of a Waterworks System at a frequency of no less than once every **5 years.**

Health Protection and Environmental Services

Parksville (250) 248-2044 Fax: (250) 248-8624
Nanaimo (250) 755-6215 Fax: (250) 755-3372
Port Alberni (250) 724-1281 Fax: (250) 724-4376
Courtenay (250) 334-5450 Fax: (250) 334-5466

Our Vision: Healthy People, Healthy Island Communities, Seamless Service

Water System Operating Conditions

Appendix F

Condition 3.

Develop and implement a wellhead protection plan to ensure that the drinking water source is protected in to the future. The wellhead protection plan should establish management strategies to avoid contamination of, or activities, which may degrade the quality of the drinking water source. The details of the wellhead protection plan and timing of the implementation of the program shall be established in consultation with the local Environmental Health Officer.

The wellhead protection plan should be based on the publication "Well Protection Tool Kit", Ministry of Environment, Lands and Parks, Ministry of Health and Ministry of Municipal Affairs; Issued by: Water Stewardship Division. ISBN 0-7726-5566-9.
http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/wells/well_protection/wellprotect.html

Condition 4.

Develop and implement a Cross-Connection Control Program. The details of the cross-connection program and timing of implementation of the program shall be established in consultation with the local Environmental Health Officer.

Condition 5.

Provide continuous on-line turbidity monitoring of raw water for the Englishman River during drawing periods (May through October as applicable) and ensure the Emergency Response Plan includes appropriate action for turbidity events as detailed in the *"Decision Tree for Responding to a Turbidity Event in Unfiltered Drinking Water"*.

Condition 6.

In accordance with VIHA 4321 treatment policy for the Englishman River water source, provide finished water quality using technology that will achieve the following performance standard; a 4-log removal/inactivation of viruses, a 3-log removal/inactivation of Giardia cysts and Cryptospordium oocysts, provide two treatment processes and produce finished water with less that 1 NTU turbidity.

In consultation with, and in reference to the City of Parksville letter dated February 4, 2009 (Your file 5600-10-AWS), the City of Parksville is required to meet the following implementation plan:

May, 2009: Obtain the services of a professional engineering firm to develop a conceptual plan and preliminary design for a water intake and treatment facility.
November, 2010: Conceptual plan and preliminary design is completed.
December, 2013: Detailed design of the new intake and treatment facility is completed.
January, 2015: Construction for the water intake and treatment facility commences with completion scheduled for December 31, 2016.

Date: April 24, 2009

B. Wrenall