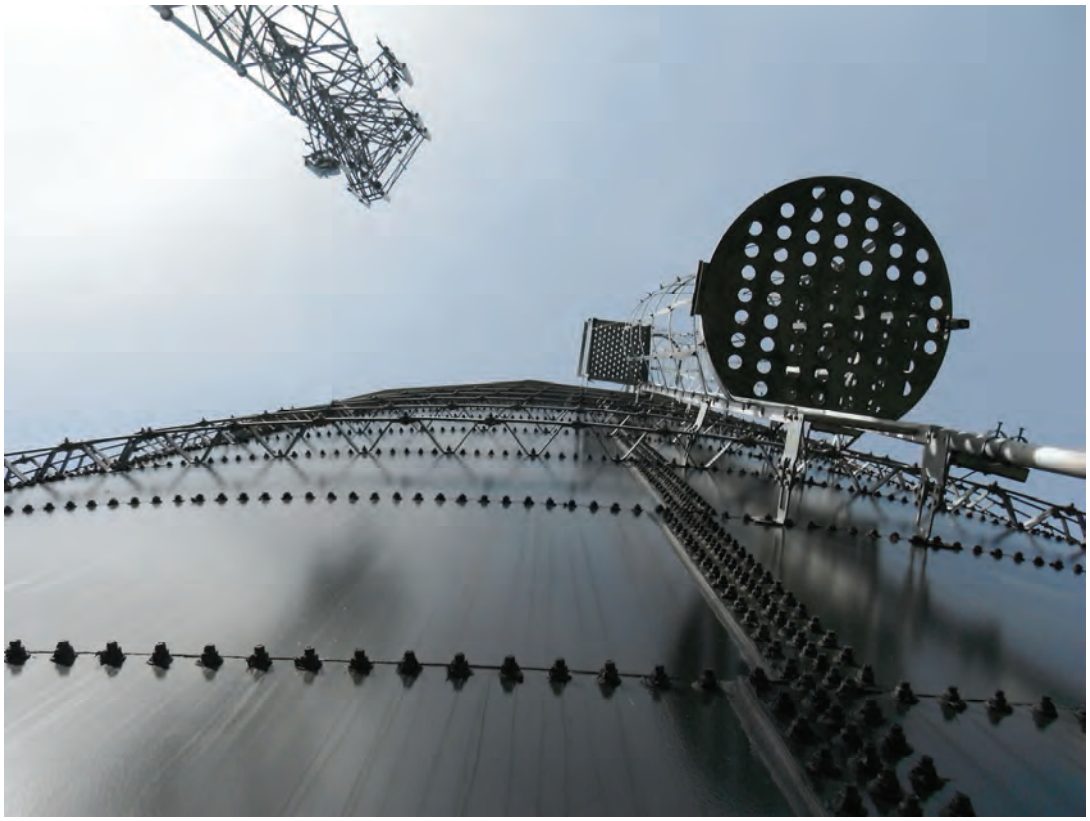
City of Parksville

2012 ANNUAL WATER REPORT



May 2013

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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 the Vancouver Island Health Authority and is posted on the City of Parksville Website. www.Parksville.ca.

2.0 Parksville Water System:

The City of Parksville has approximately 4500 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 3 sources.

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

The water is treated using either liquid or gaseous chlorine and stored in 4 reservoirs at either end of the City.

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 18 production wells ranging from 0.9 l/s (12 IGPM) to 10.3 l/s (136 IGPM).
See **Appendix A** for Well locations.

Well Name	Well Depth (m)	Production (l/s, Igpm)
Springwood Well #1	31.9	0.9, 12
Springwood Well #2	10.4	Off Line
Springwood Well #3	25.3	1.3, 18
Springwood Well #4	9.8	Off Line
Springwood Well #5	31.0	6.0, 80
Springwood Well #6	31.1	6.7, 88
Springwood Well #7	40.2	9.1, 120
Springwood Well #8	39.4	10.3, 136
Springwood Well #10	25.6	9.0, 118
Springwood Well #11	30.6	7.0, 92
Railway Well#1	30.7	5.0, 66
Railway Well#2	32.2	5.3, 70
Railway Well#3	25.2	2.5, 33
Railway Well#4	22.5	1.7, 22
Railway Well#5	36.3	7.3, 97
Railway Well#6	36.7	6.2, 83
Railway Well#7	34.2	4.1, 55
Railway Well #8	28.6	4.5, 60
Trill Well#8	25.1	Off Line

2.2 River Intake:

Between May and October the City pumps water from the Englishman River at a maximum rate of 159 l/s (2100 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. (See **Appendix B**)

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 2000. The dam has a capacity of 9,000,000 m3 and is operated and maintained by City of Parksville staff. Water is released to the Englishman river through 2 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 2012.

2.4 Reservoirs:

Water that has been pumped either from the ground or from the river is stored in 4 reservoirs. Reservoirs numbers 1, 2 and 4 are located in the Springwood Water Compound on Despard Road. These 3 are concrete with 2 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).

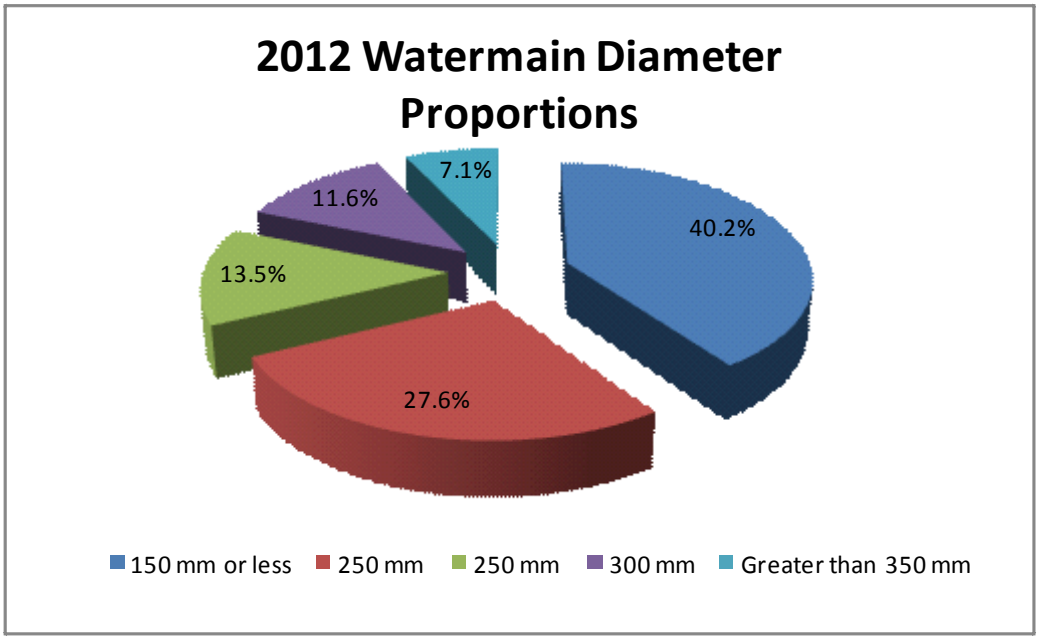
There are 2 additional reservoirs at the Top Bridge Park area, numbers 3 and 5. Reservoir #5 is a glass fused steel tank, Reservoir #3 is a steel tank although currently not in use. Storage capacities are:

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

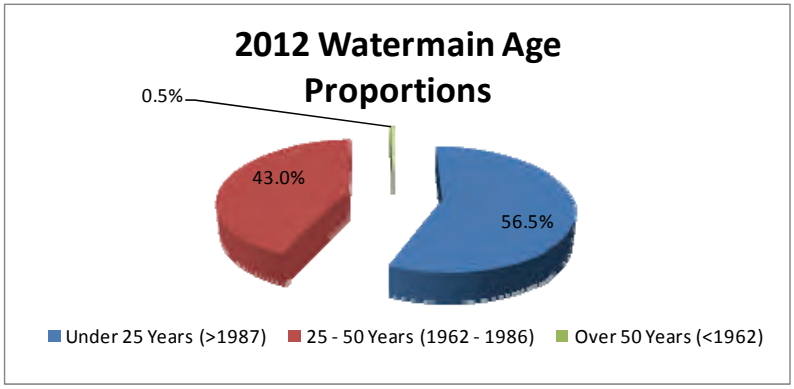
3.0 Distribution System:

The distribution system consists of 54 km of PVC (plastic) pipe, 8.3 km of Ductile Iron pipe and 32 km of AC (Asbestos Cement) pipe. Sizes range from 4" to 14".
There are 468 fire hydrants and one Pressure Reducing Valve (PRV).

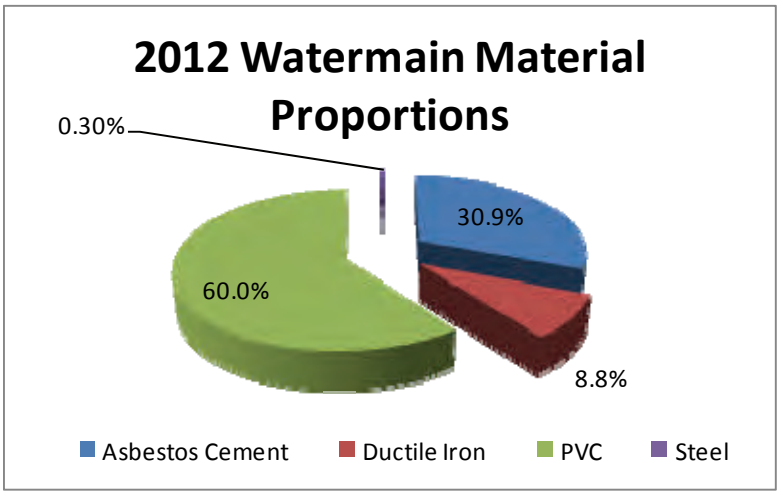
Like all municipalities, the infrastructure is aging and water mains are being replaced through capital improvements. The following shows the size, age and material of the mains in the Parksville Water System in 2009. Some of these pipes have been replaced since 2009 but 2011 data has not yet been graphed.



2012 Watermain Diameter Proportions				
Diameter	**No Pipes**	**Distance (km)**	**Percentage**	**Type**
150 mm or less	559	38.196	40.2%	Distribution Mains 67.8%
250 mm	336	26.232	27.6%	
250 mm	166	12.830	13.5%	Supply Mains 32.2%
300 mm	142	11.000	11.6%	
Greater than 350 mm	80	6.757	7.1%	
Total:	1283	95.014 km		



2012 Watermain Age Proportions			
Age	**No Pipes**	**Distance (km)**	**Percentage**
Under 25 Years (>1987)	706	53.683	56.5%
25 - 50 Years (1962 - 1986)	549	40.856	43.0%
Over 50 Years (<1962)	28	0.475	0.5%
Total:	1283	95.014	km



2012 Watermain Material Proportions		
Material Types	**Distance (km)**	**Percentage**
Asbestos Cement	29.359	30.9%
Ductile Iron	8.318	8.8%
PVC	57.008	60.0%
Steel	0.327	0.30%
Total:	95.014	km

3.1 Pressure Zones:

The City is divided into 2 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.

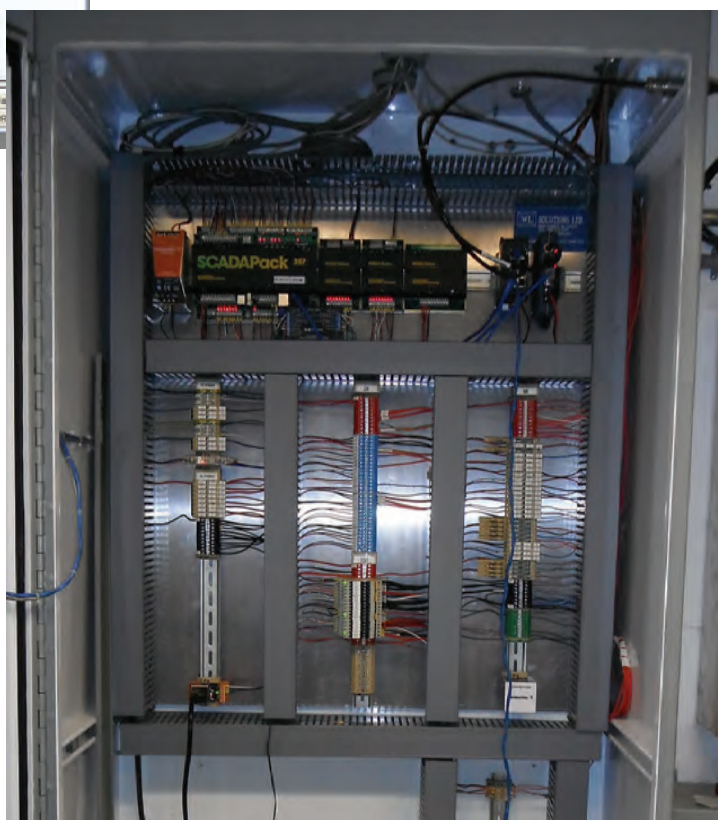
The high pressure system initially was developed for higher elevation regions of the city that didn't have sufficient pressures or flows to meet fire fighting flows. This high pressure zone has been expanded to areas furthest from the pump stations that lose pressure and flow due to line losses. In order 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 4 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.

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 on/off 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 monitor the system 24 hours a day, 7 days a week.



5.0 Water Sampling and Testing

5.1 Bacteriological

As required by the Vancouver Island Health Authority (VIHA), 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 2012 test results (L1 means Less than 1 - 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 2012 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.

6.0 Water Quality Complaints

The Engineering and Operations Department had very few water quality complaints throughout 2012. During periods of high flows or during water main flushing and fire hydrant maintenance there were a few calls related to “brown or dirty” water. A majority of these complaints were on dead end lines. City of Parksville crews would either reflush the mains through a hydrant or flushout at a spot 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, there is not much we can do 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 concerns about calcium 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 is mixed with the well supply. The river water is considered “Soft”.

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%

City of Parksville staff completed a year long water quality monitoring program of the Englishman River. This data was used to determine the best type of treatment process for a water treatment plant. Membrane technology has been chosen. A consultant will be chosen to complete the design of the plant and intake structure.

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 2 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

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

8.5 Pump Stations

- Daily checks of pumps and chlorination system
- Security checks of compounds

9.0 2012 Improvements:

- Upgraded security system at Reservoir #5
- New communication lines to Springwood Wells
- Continuing upgrades to SCADA HMI computer
- Arrowsmith Dam road work. Ditching and culverts
- Continue to replace old style flush outs at dead ends to improve flows while flushing
- Hired a Technician to work on Cross Connection Control Program

10.0 2012 Capital Projects:

- Completed McMillan Street upgrades: water, sewer, storm, hydro
- Water treatment plant piloting
- Exploratory well drilling for Aquifer Storage and Recovery
- Completed raw water quality analysis of Englishman River

11.0 2013 Capital Projects and Improvements:

- Continue with well rehabilitation on aging wells. Springwood Well #3
- Starting a water meter change out program
- Continue developing the cross connection program
- Continuing to replace aging water mains for better distribution.
- As per the Drinking Water Protection Act, the 4321 rule affecting surface water supplies is being addressed through the Arrowsmith Water Service and the Englishman River Water Service with an engineering study looking at an updated river intake and water treatment plant.
- Temple Street water/ sewer / storm upgrades
- Island Highway water / sewer / storm upgrades
- New 150mm water service for the Community Park Sports Field

12.0 Cross Connection Control Program

In May 2006 the City of Parksville developed a draft cross connection control program as is currently working on the implementation of it.

The cross connection program will be implemented in a manner that will address 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. An approved backflow device will have to be installed.

All City owner facilities were assessed and appropriate backflow installed. A tracking program called Backflow Prevention Maintenance Software was installed to track devices around the City and produce letters reminding businesses of when testing is due.

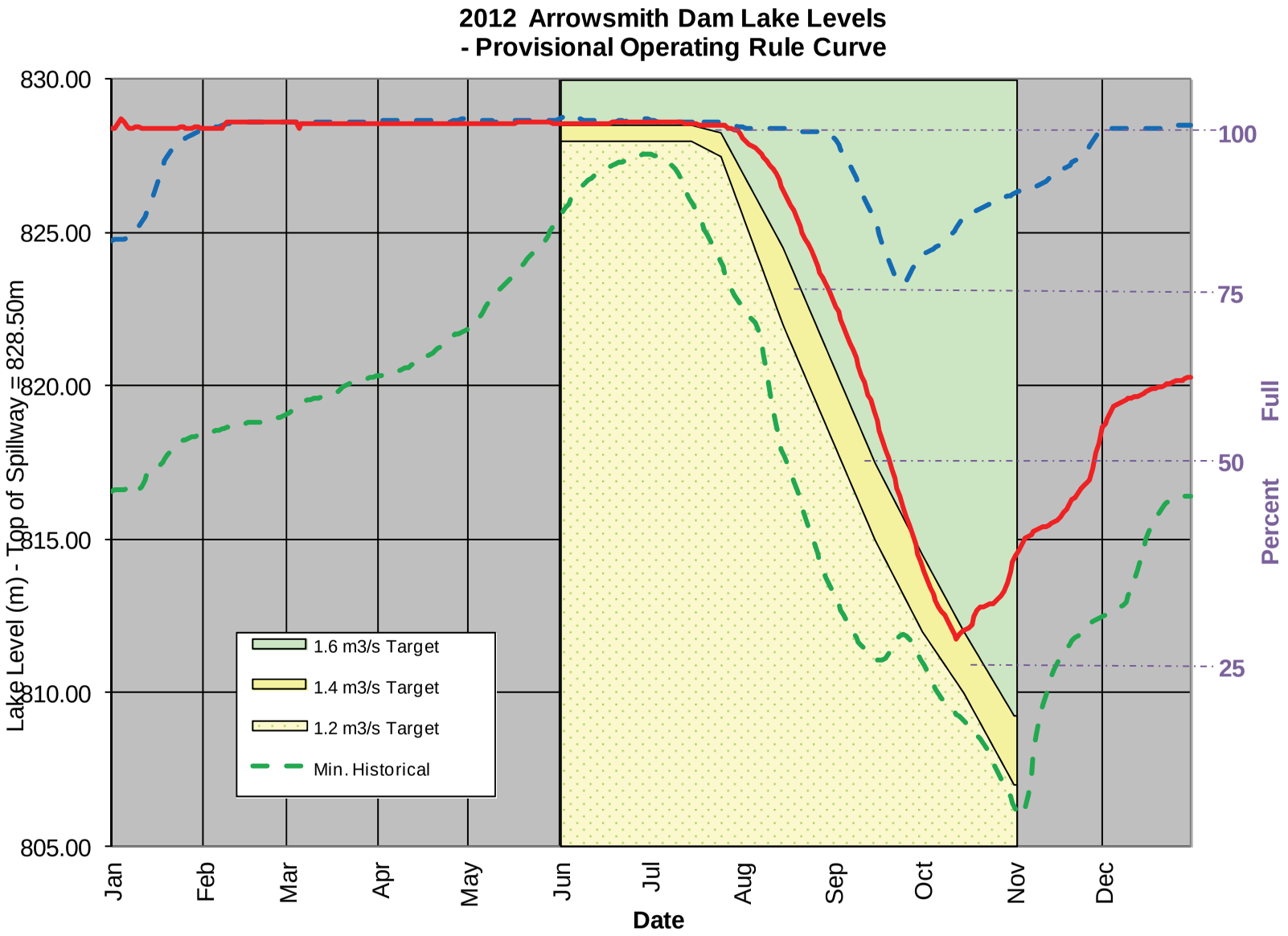
City staff remain watchful of potential cross connections in the fields and report problems back to Cross Connection Control Coordinator.

Double Check Valve Assembly

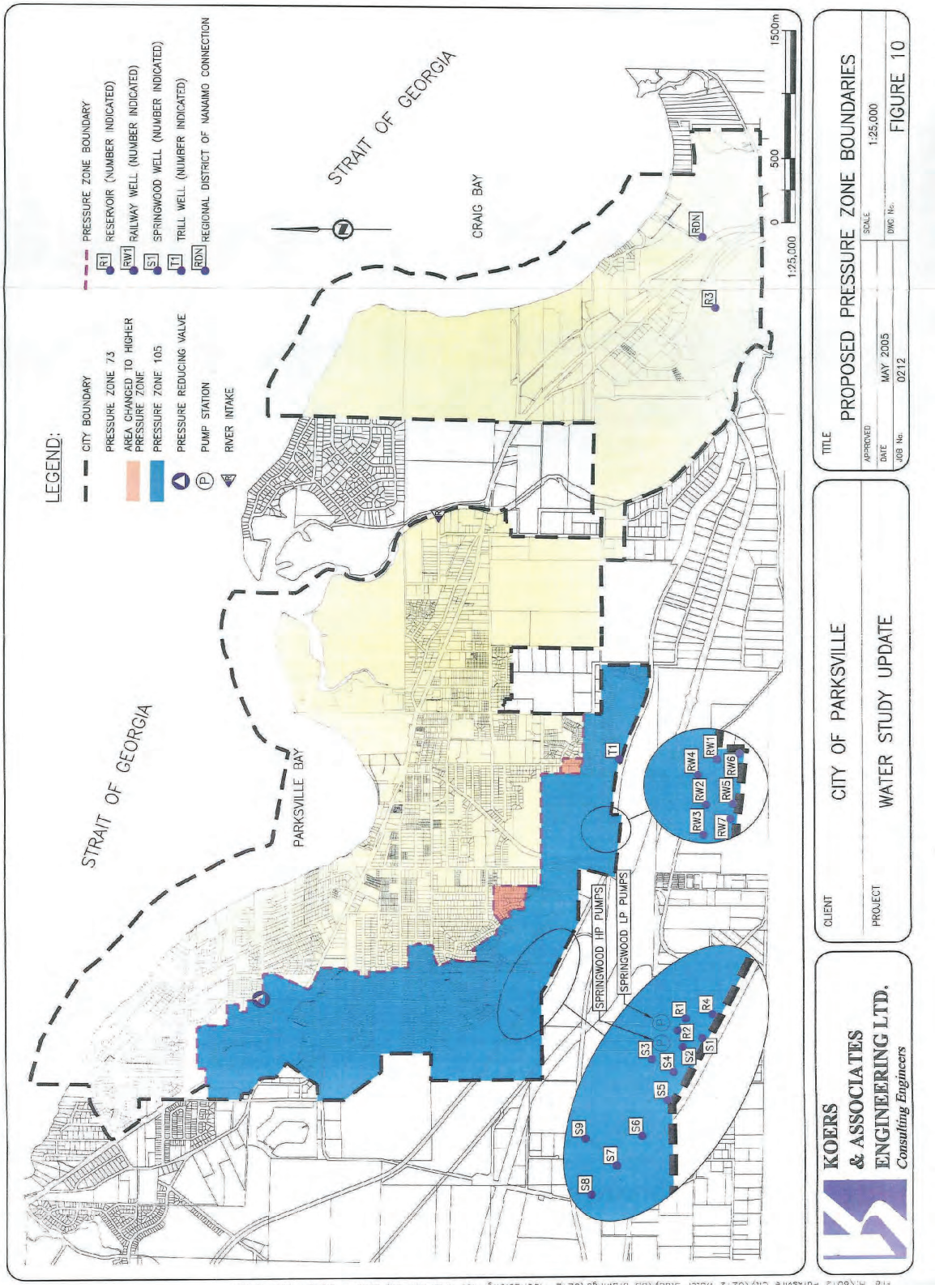
13.0 Emergency Response Plan

The City of Parksville has an Emergency Response Plan pertaining to the water system available for public viewing at the Engineering and Operations Department. This document outlines the strategies to deal with events such as contamination of water supply, pump failures and turbidity events. This plan continues to be updated.

Water Source Locations Map


2012 Arrowsmith Dam Lake Levels
- Provisional Operating Rule Curve
830.00
825.00
820.00
815.00
810.00
805.00
Lake Level (m) - Top of Spillway = 828.50m
100
75
50
25
Percent Full
1.6 m3/s Target
1.4 m3/s Target
1.2 m3/s Target
Min. Historical
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Date

Map of Pressure Zone Boundaries



2012 Bacteriological Results

Water Sample Range Report

Vancouver Island Health Authority
Central Island

Facility Name: PARKSVILLE, WWS
Facility Type: DWT
Date Range: Jan 1 2012 to Dec 31 2012
Date Created: Jan 15 2013

Sampling Site	Date Collected	Total Coliform	E. Coli	Fecal Coliform
401 S. Moiliet Street, Parksville BC, Despard & Moilliet, Dist. site, Monthly				
	25/01/2012	L1	L1	
	22/02/2012	L1	L1	
	27/03/2012	L1	L1	
	17/04/2012	L1	L1	
	15/05/2012	L1	L1	
	26/06/2012	L1	L1	
	17/07/2012	L1	L1	
	07/08/2012	L1	L1	
	21/08/2012	L1	L1	
	18/09/2012	L1	L1	
	30/10/2012	L1	L1	
	20/11/2012	L1	L1	
	11/12/2012	L1	L1	
	Total Positive:	**0**	**0**	**0**
271 Chestnut Street, Parksville BC, 271 Chestnut Street, Parksville, Dist. site, Monthly				
	10/01/2012	L1	L1	
	01/02/2012	L1	L1	
	13/03/2012	L1	L1	
	24/04/2012	L1	L1	
	22/05/2012	L1	L1	
	19/06/2012	L1	L1	
	24/07/2012	L1	L1	
	14/08/2012	L1	L1	
	25/09/2012	L1	L1	
	02/10/2012	L1	L1	
	14/11/2012	L1	L1	
	05/12/2012	L1	L1	
	Total Positive:	**0**	**0**	**0**
1247 Arbutus Road, Parksville BC, Parksville MHP/Utility Building, Parksville, Dist. site, Monthly				
	03/01/2012	L1	L1	
	01/02/2012	L1	L1	
	06/03/2012	L1	L1	
	10/04/2012	L1	L1	

2012 Bacteriological Results

	12/06/2012	L1	L1	
	17/07/2012	L1	L1	
	07/08/2012	L1	L1	
	06/09/2012	L1	L1	
	09/10/2012	L1	L1	
	06/11/2012	L1	L1	
	05/12/2012	L1	L1	
	Total Positive:	**0**	**0**	**0**
1390 Herring Gull Way, Parksville BC, Works Yard, Parksville, Dist. site, Monthly				
	10/01/2012	L1	L1	
	07/02/2012	L1	L1	
	13/03/2012	L1	L1	
	17/04/2012	L1	L1	
	15/05/2012	L1	L1	
	19/06/2012	L1	L1	
	24/07/2012	L1	L1	
	28/08/2012	L1	L1	
	12/09/2012	L1	L1	
	16/10/2012	L1	L1	
	14/11/2012	L1	L1	
	11/12/2012	L1	L1	
	Total Positive:	**0**	**0**	**0**
193 East Island Highway, Parksville BC, Community Park, Parksville BC, Dist. site, Monthly				
	03/01/2012	L1	L1	
	01/02/2012	L1	L1	
	06/03/2012	L1	L1	
	03/04/2012	L1	L1	
	01/05/2012	L1	L1	
	05/06/2012	L1	L1	
	04/07/2012	L1	L1	
	14/08/2012	L1	L1	
	06/09/2012	L1	L1	
	02/10/2012	L1	L1	
	06/11/2012	L1	L1	
	05/12/2012	L1	L1	
	Total Positive:	**0**	**0**	**0**
249 West Hirst Avenue, Parksville BC, Health Unit, Audit TAP in kitchen, parksville BC, Dist site, No Regular Sampling				
Harbour Homes, Parksville BC, Top of Corfield, Parksville , Dist. site, Monthly				

2012 Bacteriological Results

	07/02/2012	L1	L1	
	13/03/2012	L1	L1	
	10/04/2012	L1	L1	
	08/05/2012	L1	L1	
	12/06/2012	L1	L1	
	17/07/2012	L1	L1	
	25/09/2012	L1	L1	
	09/10/2012	L1	L1	
	06/11/2012	L1	L1	
	05/12/2012	L1	L1	
	Total Positive:	0	0	0
613 Chinook Avenue, Parksville BC, 613 Chinook Avenue, Parksville , Dist. site, Monthly				
	17/01/2012	L1	L1	
	22/02/2012	L1	L1	
	21/03/2012	L1	L1	
	10/04/2012	L1	L1	
	08/05/2012	L1	L1	
	12/06/2012	L1	L1	
	17/07/2012	L1	L1	
	14/08/2012	L1	L1	
	18/09/2012	L1	L1	
	02/10/2012	L1	L1	
	06/11/2012	L1	L1	
	18/12/2012	L1	L1	
	Total Positive:	0	0	0
Daffodil at Camas, Parksville BC, Daffodil at Camas, Parksville, Dist. site, Monthly				
	10/01/2012	L1	L1	
	01/02/2012	L1	L1	
	06/03/2012	L1	L1	
	03/04/2012	L1	L1	
	01/05/2012	L1	L1	
	05/06/2012	L1	L1	
	04/07/2012	L1	L1	
	21/08/2012	L1	L1	
	06/09/2012	L1	L1	
	30/10/2012	L1	L1	
	20/11/2012	L1	L1	
	18/12/2012	L1	L1	
	Total Positive:	0	0	0
330 Park View, Parksville BC, 330 Park View, Parksville, Dist. site, Monthly				
	17/01/2012	L1	L1	
	15/02/2012	L1	L1	
	21/03/2012	L1	L1	
	10/04/2012	L1	L1	
	08/05/2012	L1	L1	

2012 Bacteriological Results

	04/07/2012	24	L1	
	10/07/2012	L1	L1	
	21/08/2012	L1	L1	
	12/09/2012	L1	L1	
	02/10/2012	L1	L1	
	27/11/2012	L1	L1	
	18/12/2012	L1	L1	
	Total Positive:	**1**	**0**	**0**
136 Memorial, Dist. site, Monthly				
	25/01/2012	L1	L1	
	28/02/2012 9:00:00 PM	L1	L1	
	27/03/2012	L1	L1	
	24/04/2012	L1	L1	
	22/05/2012	L1	L1	
	26/06/2012	L1	L1	
	31/07/2012	L1	L1	
	28/08/2012	L1	L1	
	25/09/2012	L1	L1	
	30/10/2012	L1	L1	
	27/11/2012	L1	L1	
	18/12/2012	L1	L1	
	Total Positive:	**0**	**0**	**0**
851 Temple, 851 TEMPLE (beside), Dist. site, Monthly				
	10/01/2012	L1	L1	
	07/02/2012	L1	L1	
	06/03/2012	L1	L1	
	03/04/2012	L1	L1	
	01/05/2012	L1	L1	
	05/06/2012	L1	L1	
	10/07/2012	L1	L1	
	07/08/2012	L1	L1	
	06/09/2012	L1	L1	
	24/10/2012	L1	L1	
	20/11/2012	L1	L1	
	11/12/2012	L1	L1	
	Total Positive:	**0**	**0**	**0**
450 Wisteria, across from 450 Wisteria, Dist. site, Monthly				
	25/01/2012	L1	L1	
	28/02/2012 9:00:00 PM	L1	L1	
	13/03/2012	L1	L1	
	24/04/2012	L1	L1	
	22/05/2012	L1	L1	
	19/06/2012	L1	L1	
	24/07/2012	L1	L1	
	28/08/2012	L1	L1	
	12/09/2012	L1	L1	
	09/10/2012	L1	L1	
	14/11/2012	L1	L1	
	05/12/2012	L1	L1	
	Total Positive:	**0**	**0**	**0**

2012 Bacteriological Results

378 Kingsley Street, Wheeler, Top of Kingsley, Dist. site, Monthly				
	03/01/2012	L1	L1	
	22/02/2012	L1	L1	
	21/03/2012	L1	L1	
	24/04/2012	L1	L1	
	22/05/2012	L1	L1	
	19/06/2012	L1	L1	
	10/07/2012	L1	L1	
	07/08/2012	L1	L1	
	12/09/2012	L1	L1	
	24/10/2012	L1	L1	
	14/11/2012	L1	L1	
	11/12/2012	L1	L1	
	Total Positive:	**0**	**0**	**0**
Englishman River Intake, River Pump Station, Dist. site, Monthly				
	25/01/2012	L1	L1	
	15/02/2012	L1	L1	
	27/03/2012	L1	L1	
	03/04/2012	L1	L1	
	01/05/2012	L1	L1	
	05/06/2012	L1	L1	
	10/07/2012	L1	L1	
	21/08/2012	L1	L1	
	18/09/2012	L1	L1	
	24/10/2012	L1	L1	
	20/11/2012	L1	L1	
	05/12/2012	L1	L1	
	Total Positive:	**0**	**0**	**0**
Island Highway, by Temple, Island Highway, by Temple, Dist. site, Monthly				
	17/01/2012	L1	L1	
	28/02/2012 9:00:00 PM	L1	L1	
	21/03/2012	L1	L1	
	17/04/2012	L1	L1	
	15/05/2012	L1	L1	
	26/06/2012	L1	L1	
	31/07/2012	L1	L1	
	28/08/2012	L1	L1	
	25/09/2012	L1	L1	
	16/10/2012	L1	L1	
	27/11/2012	L1	L1	
	18/12/2012	L1	L1	
	Total Positive:	**0**	**0**	**0**

2012 Bacteriological Results

Water Sample Range Report for PARKSVILLE, WWS

770 Soriel, 770 Soriel , Dist. site, Monthly

03/01/2012	L1	L1	
15/02/2012	L1	L1	
27/03/2012	L1	L1	
17/04/2012	L1	L1	
15/05/2012	L1	L1	
26/06/2012	L1	L1	
04/07/2012	L1	L1	
14/08/2012	L1	L1	
18/09/2012	L1	L1	
16/10/2012	L1	L1	
27/11/2012	L1	L1	
11/12/2012	L1	L1	
Total Positive:	**0**	**0**	**0**

491 Island Highway, East, City of Parksville, 491 Island Hwy, Audit, Dist. site, No Regular Sampling

Result Values: **E - estimated** **L - less than** **G - greater than**

Interpreting Sample Reports

In VIHA, the results of drinking water sampling are reported using the following coding system:

L1 Less than 1 (no detectable bacteria) - Meaning: No bacteria present

OG Overgrown - Meaning: Too many background bacteria to give an accurate count

EST Estimated Count

and

A Sample not tested; Too long in transit

C Sample leaked/broken in transit

D Sample not tested; No collection date given

T Sample submitted unsatisfactory. Exceeded 30 hours holding time, please resample.

NS No sample received with requisition

2012 Bacteriological Results

Water Sample Range Report for PARKSVILLE, WWS

Samples that contain total coliform:	1	0.52% of total
Samples that contain e. coli:	0	0.00% of total
Samples that contain fecal coliform:	0	0.00% of total
Number of positive samples in last 30 days:	0/16	
Total number of samples:	193	

Comments:

Environmental Health Officer
Jan 16 2013

FOR FURTHER INFORMATION PLEASE CALL: Wrathall, Bill (250) 947-8222 Parksville

Operator

City of Parksville
1390 Box
Parksville, BC
V9P 2H3

(250) 248-5412

Full Spectrum Analysis –Well Water

Maxxam

Your P.O. #: 00666
Your C.O.C. #: 27467101

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

Report Date: 2012/10/18

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B292028
Received: 2012/10/12, 09:30

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water	1	2012/10/12	2012/10/13	BBY6SOP-00026	SM2320B
Chloride by Automated Colourimetry	1	N/A	2012/10/12	BBY6SOP-00011	SM-4500-Cl-
Colour (True)	1	N/A	2012/10/12	BBY6SOP-00021	SM-2120B
Coliform by membrane filtration	1	N/A	2012/10/12	BRN SOP 00363 R2.0	Based on SM-9222
E.coli by membrane filtration in Water	1	N/A	2012/10/12	BRN SOP 00363 R2.0	Based on SM-9222
Conductance - water	1	N/A	2012/10/13	BBY6SOP-00026	SM-2510B
Fluoride	1	N/A	2012/10/15	BBY6SOP-00038	SM - 4500 F C
Hardness Total (calculated as CaCO3)	1	N/A	2012/10/17	BBY WI-00033	Calculated Parameter
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2012/10/17	BBY7SOP-00002	EPA 6020A
Elements by CRC ICPMS (total)	1	N/A	2012/10/17	BBY7SOP-00002	EPA 6020A
Nitrate + Nitrite (N)	1	N/A	2012/10/12	BBY6SOP-00010	USEPA 353.2
Nitrite (N) by CFA	1	N/A	2012/10/12	BBY6SOP-00010	EPA 353.2
Nitrogen - Nitrate (as N)	1	N/A	2012/10/15	BBY6SOP-00010	Based on EPA 353.2
pH Water	1	N/A	2012/10/13	BBY6SOP-00026	SM-4500H+B
Sulphate by Automated Colourimetry	1	N/A	2012/10/12	BBY6SOP-00017	SM4500-SO42
Total Dissolved Solids (Filt. Residue)	1	2012/10/17	2012/10/17	BBY6SOP-00033	SM 2540C
Turbidity	1	N/A	2012/10/12	BBY6SOP-00027	SM - 2130B

" Results relate only to the items tested.

Encryption Key

Maxxam
18 Oct 2012 19:02:32 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Dana Stevenson, Burnaby Project Manager
Email: DStevenson@maxxam.ca
Phone# (604) 734 7276

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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.

Total cover pages: 1

Full Spectrum Analysis—Well Water

Maxxam

Success Through Sc

Maxxam Job #: B292028
Report Date: 2012/10/18

City of Parksville

Your P.O. #: 00666
Sampler Initials: KM

MICROBIOLOGY (WATER)

Maxxam ID		ES1933		
Sampling Date		2012/10/11 13:05		
	UNITS	RAILWAY WELL #8	RDL	QC Batch
Microbiological Param.				
E. coli	CFU/100mL	<1	1	6248507
Total Coliforms	CFU/100mL	<1	1	6248504

RDL = Reportable Detection Limit

Full Spectrum Analysis—Well Water

Maxxam

Numbers Through Science

Maxxam Job #: B292028
Report Date: 2012/10/18

City of Parksville

Your P.O. #: 00666
Sampler Initials: KM

DRINKING WATER PACKAGE (WATER)

Maxxam ID		ES1933		
Sampling Date		2012/10/11 13:05		
	UNITS	RAILWAY WELL #8	RDL	QC Batch
ANIONS				
Nitrite (N)	mg/L	<0.0050	0.0050	6250821
Calculated Parameters				
Total Hardness (CaCO3)	mg/L	121	0.50	6247501
Nitrate (N)	mg/L	0.317	0.020	6247831
Misc. Inorganics				
Fluoride (F)	mg/L	0.072	0.010	6254663
Alkalinity (Total as CaCO3)	mg/L	96.9	0.50	6250911
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	6250911
Bicarbonate (HCO3)	mg/L	118	0.50	6250911
Carbonate (CO3)	mg/L	<0.50	0.50	6250911
Hydroxide (OH)	mg/L	<0.50	0.50	6250911
Anions				
Dissolved Sulphate (SO4)	mg/L	8.58	0.50	6249528
Dissolved Chloride (Cl)	mg/L	23	0.50	6249495
MISCELLANEOUS				
True Colour	Col. Unit	5.0	5.0	6248696
Nutrients				
Nitrate plus Nitrite (N)	mg/L	0.317	0.020	6250820
Physical Properties				
Conductivity	uS/cm	286	1.0	6250912
pH	pH Units	7.80		6250913
Physical Properties				
Total Dissolved Solids	mg/L	178	10	6262411
Turbidity	NTU	0.13	0.10	6248698

RDL = Reportable Detection Limit

APPENDIX E

Full Spectrum Analysis—Well Water

Maxxam

Success Through Sci

Maxxam Job #: B292028
Report Date: 2012/10/18

City of Parksville

Your P.O. #: 00666
Sampler Initials: KM

DRINKING WATER PACKAGE (WATER)

Maxxam ID		ES1933		
Sampling Date		2012/10/11 13:05		
	UNITS	RAILWAY WELL #8	RDL	QC Batch
Total Metals by ICPMS				
Total Aluminum (Al)	ug/L	<3.0	3.0	6262615
Total Antimony (Sb)	ug/L	<0.50	0.50	6262615
Total Arsenic (As)	ug/L	0.18	0.10	6262615
Total Barium (Ba)	ug/L	7.6	1.0	6262615
Total Boron (B)	ug/L	<50	50	6262615
Total Cadmium (Cd)	ug/L	0.060	0.010	6262615
Total Chromium (Cr)	ug/L	<1.0	1.0	6262615
Total Cobalt (Co)	ug/L	<0.50	0.50	6262615
Total Copper (Cu)	ug/L	2.52	0.20	6262615
Total Iron (Fe)	ug/L	32.7	5.0	6262615
Total Lead (Pb)	ug/L	0.90	0.20	6262615
Total Manganese (Mn)	ug/L	30.2	1.0	6262615
Total Mercury (Hg)	ug/L	<0.050	0.050	6262615
Total Molybdenum (Mo)	ug/L	<1.0	1.0	6262615
Total Nickel (Ni)	ug/L	1.9	1.0	6262615
Total Selenium (Se)	ug/L	0.45	0.10	6262615
Total Silver (Ag)	ug/L	<0.020	0.020	6262615
Total Uranium (U)	ug/L	0.13	0.10	6262615
Total Vanadium (V)	ug/L	<5.0	5.0	6262615
Total Zinc (Zn)	ug/L	75.0	5.0	6262615
Total Calcium (Ca)	mg/L	26.8	0.050	6248455
Total Magnesium (Mg)	mg/L	13.2	0.050	6248455
Total Potassium (K)	mg/L	0.624	0.050	6248455
Total Sodium (Na)	mg/L	6.21	0.050	6248455
Total Sulphur (S)	mg/L	3.5	3.0	6248455

RDL = Reportable Detection Limit

Full Spectrum Analysis—Well Water

Maxxam

Your P.O. #: 00666
Your C.O.C. #: 27479501

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

Report Date: 2012/10/18

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B292042
Received: 2012/10/12, 09:30

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water	1	2012/10/12	2012/10/13	BBY6SOP-00026	SM2320B
Chloride by Automated Colourimetry	1	N/A	2012/10/15	BBY6SOP-00011	SM-4500-Cl-
Colour (True)	1	N/A	2012/10/12	BBY6SOP-00021	SM-2120B
Coliform by membrane filtration	1	N/A	2012/10/12	BRN SOP 00363 R2.0	Based on SM-9222
E.coli by membrane filtration in Water	1	N/A	2012/10/12	BRN SOP 00363 R2.0	Based on SM-9222
Conductance - water	1	N/A	2012/10/13	BBY6SOP-00026	SM-2510B
Fluoride	1	N/A	2012/10/15	BBY6SOP-00038	SM - 4500 F C
Hardness Total (calculated as CaCO3)	1	N/A	2012/10/17	BBY WI-00033	Calculated Parameter
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2012/10/17	BBY7SOP-00002	EPA 6020A
Elements by CRC ICPMS (total)	1	N/A	2012/10/17	BBY7SOP-00002	EPA 6020A
Nitrate + Nitrite (N)	1	N/A	2012/10/13	BBY6SOP-00010	USEPA 353.2
Nitrite (N) by CFA	1	N/A	2012/10/13	BBY6SOP-00010	EPA 353.2
Nitrogen - Nitrate (as N)	1	N/A	2012/10/15	BBY6SOP-00010	Based on EPA 353.2
pH Water	1	N/A	2012/10/13	BBY6SOP-00026	SM-4500H+B
Sulphate by Automated Colourimetry	1	N/A	2012/10/15	BBY6SOP-00017	SM4500-SO42
Total Dissolved Solids (Filt. Residue)	1	2012/10/17	2012/10/17	BBY6SOP-00033	SM 2540C
Turbidity	1	N/A	2012/10/12	BBY6SOP-00027	SM - 2130B

* Results relate only to the items tested.

Encryption Key

Maxxam
16 Oct 2012 19:02:05 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Dana Stevenson, Burnaby Project Manager
Email: DStevenson@maxxam.ca
Phone# (604) 734 7276

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Total cover pages: 1

Full Spectrum Analysis—Well Water

Maxxam

Success Through Science

Maxxam Job #: B292042
Report Date: 2012/10/18

City of Parksville

Your P.O. #: 00666
Sampler Initials: KM

MICROBIOLOGY (WATER)

Maxxam ID		ES1989		
Sampling Date		2012/10/11 12:40		
	UNITS	SPRINGWOOD WELL #10	RDL	QC Batch
Microbiological Param.				
E. coli	CFU/100mL	<1	1	6249331
Total Coliforms	CFU/100mL	<1	1	6249329

RDL = Reportable Detection Limit

Full Spectrum Analysis—Well Water

Maxxam

Success Through S

Maxxam Job #: B292042
Report Date: 2012/10/18

City of Parksville

Your P.O. #: 00666
Sampler Initials: KM

DRINKING WATER PACKAGE (WATER)

Maxxam ID		ES1989		
Sampling Date		2012/10/11 12:40		
	UNITS	SPRINGWOOD WELL #10	RDL	QC Batch
ANIONS				
Nitrite (N)	mg/L	<0.0050	0.0050	6251628
Calculated Parameters				
Total Hardness (CaCO3)	mg/L	120	0.50	6247501
Nitrate (N)	mg/L	0.906	0.020	6247831
Misc. Inorganics				
Fluoride (F)	mg/L	0.055	0.010	6254663
Alkalinity (Total as CaCO3)	mg/L	107	0.50	6250911
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	6250911
Bicarbonate (HCO3)	mg/L	131	0.50	6250911
Carbonate (CO3)	mg/L	<0.50	0.50	6250911
Hydroxide (OH)	mg/L	<0.50	0.50	6250911
Anions				
Dissolved Sulphate (SO4)	mg/L	7.14	0.50	6255202
Dissolved Chloride (Cl)	mg/L	19	0.50	6254941
MISCELLANEOUS				
True Colour	Col. Unit	<5.0	5.0	6248696
Nutrients				
Nitrate plus Nitrite (N)	mg/L	0.906	0.020	6251623
Physical Properties				
Conductivity	uS/cm	286	1.0	6250912
pH	pH Units	7.79		6250913
Physical Properties				
Total Dissolved Solids	mg/L	172	10	6252411
Turbidity	NTU	<0.10	0.10	6248688

RDL = Reportable Detection Limit

APPENDIX E

Full Spectrum Analysis—Well Water

Maxxam

Maxxam Job #: B292042
Report Date: 2012/10/18

City of Parksville

Your P.O. #: 00666
Sampler Initials: KM

DRINKING WATER PACKAGE (WATER)

Maxxam ID		ES1989		
Sampling Date		2012/10/11 12:40		
	UNITS	SPRINGWOOD WELL #10	RDL	QC Batch
Total Metals by ICPMS				
Total Aluminum (Al)	ug/L	<3.0	3.0	6262615
Total Antimony (Sb)	ug/L	<0.50	0.50	6262615
Total Arsenic (As)	ug/L	0.19	0.10	6262615
Total Barium (Ba)	ug/L	9.1	1.0	6262615
Total Boron (B)	ug/L	<50	50	6262615
Total Cadmium (Cd)	ug/L	<0.010	0.010	6262615
Total Chromium (Cr)	ug/L	<1.0	1.0	6262615
Total Cobalt (Co)	ug/L	<0.50	0.50	6262615
Total Copper (Cu)	ug/L	1.52	0.20	6262615
Total Iron (Fe)	ug/L	6.5	5.0	6262615
Total Lead (Pb)	ug/L	0.30	0.20	6262615
Total Manganese (Mn)	ug/L	3.1	1.0	6262615
Total Mercury (Hg)	ug/L	<0.050	0.050	6262615
Total Molybdenum (Mo)	ug/L	<1.0	1.0	6262615
Total Nickel (Ni)	ug/L	<1.0	1.0	6262615
Total Selenium (Se)	ug/L	0.11	0.10	6262615
Total Silver (Ag)	ug/L	<0.020	0.020	6262615
Total Uranium (U)	ug/L	<0.10	0.10	6262615
Total Vanadium (V)	ug/L	<5.0	5.0	6262615
Total Zinc (Zn)	ug/L	<5.0	5.0	6262615
Total Calcium (Ca)	mg/L	27.0	0.050	6248455
Total Magnesium (Mg)	mg/L	12.8	0.050	6248455
Total Potassium (K)	mg/L	0.591	0.050	6248455
Total Sodium (Na)	mg/L	7.13	0.050	6248455
Total Sulphur (S)	mg/L	<3.0	3.0	6248455

RDL = Reportable Detection Limit

Full Spectrum Analysis—Raw River Water

Maxxam

Success Through Science

Your P.O. #: 00348
Your C.O.C. #: 32531001

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

Report Date: 2012/09/13

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B279455
Received: 2012/09/06, 09:15

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water	1	2012/09/07	2012/09/08	BBY6SOP-00026	SM2320B
Chloride by Automated Colourimetry	1	N/A	2012/09/07	BBY6SOP-00011	SM-4500-Cl-
Colour (True)	1	N/A	2012/09/07	BBY6SOP-00021	SM-2120B
Coliform by membrane filtration	1	N/A	2012/09/06	BRN SOP 00363 R2.0	Based on SM-9222
E.coli by membrane filtration in Water	1	N/A	2012/09/06	BRN SOP 00363 R2.0	Based on SM-9222
Conductance - water	1	N/A	2012/09/08	BBY6SOP-00026	SM-2510B
Fluoride	1	N/A	2012/09/07	BBY6SOP-00038	SM - 4500 F C
Hardness Total (calculated as CaCO3)	1	N/A	2012/09/12	BBY WI-00033	Calculated Parameter
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2012/09/12	BBY7SOP-00002	EPA 6020A
Elements by CRC ICPMS (total)	1	N/A	2012/09/12	BBY7SOP-00002	EPA 6020A
Nitrate + Nitrite (N)	1	N/A	2012/09/06	BBY6SOP-00010	USEPA 353.2
Nitrite (N) by CFA	1	N/A	2012/09/06	BBY6SOP-00010	EPA 353.2
Nitrogen - Nitrate (as N)	1	N/A	2012/09/07	BBY6SOP-00010	Based on EPA 353.2
pH Water	1	N/A	2012/09/08	BBY6SOP-00026	SM-4500H+B
Sulphate by Automated Colourimetry	1	N/A	2012/09/07	BBY6SOP-00017	SM4500-SO42
Total Dissolved Solids (Filt. Residue)	1	2012/09/12	2012/09/12	BBY6SOP-00033	SM 2540C
Turbidity	1	N/A	2012/09/07	BBY6SOP-00027	SM - 2130B

* Results relate only to the items tested.

Encryption Key

Maxxam
13 Sep 2012 12:46:55 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Dana Stevenson, Burnaby Project Manager
Email: DStevenson@maxxam.ca
Phone# (604) 734 7276

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Total cover pages: 1

Full Spectrum Analysis—Raw River Water

Maxxam

Success Through Scie

Maxxam Job #: B279455
Report Date: 2012/09/13

City of Parksville

Your P.O. #: 00348
Sampler Initials: SC

MICROBIOLOGY (WATER)

Maxxam ID			Ey9248		
Sampling Date			2012/09/05 01:30		
	UNITS		NEW INTAKE	RDL	QC Batch
Microbiological Param.					
E. coli	CFU/100mL		21	1	6147360
Total Coliforms	CFU/100mL		230	1	6147362

RDL = Reportable Detection Limit

Full Spectrum Analysis—Raw River Water

Maxxam

Success Through Scien

Maxxam Job #: B279455
Report Date: 2012/09/13

City of Parksville

Your P.O. #: 00348
Sampler Initials: SC

DRINKING WATER PACKAGE (WATER)

Maxxam ID		EJ9248		
Sampling Date		2012/09/05 01:30		
	UNITS	NEW INTAKE	RDL	QC Batch
ANIONS				
Nitrite (N)	mg/L	<0.0050	0.0050	6146319
Calculated Parameters				
Total Hardness (CaCO3)	mg/L	28.7	0.50	6143638
Nitrate (N)	mg/L	<0.020	0.020	6143280
Misc. Inorganics				
Fluoride (F)	mg/L	0.015	0.010	6148853
Alkalinity (Total as CaCO3)	mg/L	22.9	0.50	6147929
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	6147929
Bicarbonate (HCO3)	mg/L	27.9	0.50	6147929
Carbonate (CO3)	mg/L	<0.50	0.50	6147929
Hydroxide (OH)	mg/L	<0.50	0.50	6147929
Anions				
Dissolved Sulphate (SO4)	mg/L	1.68	0.50	6148585
Dissolved Chloride (Cl)	mg/L	12	0.50	6148579
MISCELLANEOUS				
True Colour	Col. Unit	<5.0	5.0	6149610
Nutrients				
Nitrate plus Nitrite (N)	mg/L	<0.020	0.020	6146318
Physical Properties				
Conductivity	uS/cm	86.4	1.0	6147966
pH	pH Units	7.55		6147968
Physical Properties				
Total Dissolved Solids	mg/L	56	10	6161241
Turbidity	NTU	0.42	0.10	6148111

RDL = Reportable Detection Limit

Full Spectrum Analysis—Raw River Water

Maxxam

Success Through Science

Maxxam Job #: B279455
Report Date: 2012/09/13

City of Parksville

Your P.O. #: 00348
Sampler Initials: SC

DRINKING WATER PACKAGE (WATER)

Maxxam ID		EJ9248		
Sampling Date		2012/09/05 01:30		
	UNITS	NEW INTAKE	RDL	QC Batch
Total Metals by ICPMS				
Total Aluminum (Al)	ug/L	13.5	3.0	6156529
Total Antimony (Sb)	ug/L	<0.50	0.50	6156529
Total Arsenic (As)	ug/L	0.12	0.10	6156529
Total Barium (Ba)	ug/L	5.6	1.0	6156529
Total Boron (B)	ug/L	<50	50	6156529
Total Cadmium (Cd)	ug/L	<0.010	0.010	6156529
Total Chromium (Cr)	ug/L	<1.0	1.0	6156529
Total Cobalt (Co)	ug/L	<0.50	0.50	6156529
Total Copper (Cu)	ug/L	0.79	0.20	6156529
Total Iron (Fe)	ug/L	71.1	5.0	6156529
Total Lead (Pb)	ug/L	<0.20	0.20	6156529
Total Manganese (Mn)	ug/L	8.8	1.0	6156529
Total Mercury (Hg)	ug/L	<0.050	0.050	6156529
Total Molybdenum (Mo)	ug/L	<1.0	1.0	6156529
Total Nickel (Ni)	ug/L	<1.0	1.0	6156529
Total Selenium (Se)	ug/L	<0.10	0.10	6156529
Total Silver (Ag)	ug/L	<0.020	0.020	6156529
Total Uranium (U)	ug/L	<0.10	0.10	6156529
Total Vanadium (V)	ug/L	<5.0	5.0	6156529
Total Zinc (Zn)	ug/L	<5.0	5.0	6156529
Total Calcium (Ca)	mg/L	9.56	0.050	6144624
Total Magnesium (Mg)	mg/L	1.18	0.050	6144624
Total Potassium (K)	mg/L	0.136	0.050	6144624
Total Sodium (Na)	mg/L	4.76	0.050	6144624
Total Sulphur (S)	mg/L	<3.0	3.0	6144624

RDL = Reportable Detection Limit

Full Spectrum Analysis—Raw River Water

Month: August, 2012

Date	Time	Temp	True Colour	pH	Conductivity	Turbidity	DOC	UVT	TOC
		°C	mg/L Pt Co		µs/cm	NTU			
1	3:00	19.3	7	7.4	86.4	0.7	1.4	>97.7	1.14
2	11:00	17	4	7.4	91.2	0.6			
3									
4									
5									
6									
7	3:30	17.3	4	7.49	85.8	0.7			
8	11:00	17.3	3	7.58	88	0.6			
9	10:00	18.1	9	7.39	91.2	0.6			
10	1:00	17.9	12	7.42	93	0.6			
11									
12									
13	1:00	18.7	2	7.51	91.2	0.6			
14	10:00	18.8	7	7.66	80	0.6	1.51	>97.7	1.06
15	11:30	19.1	17	7.41	86.1	0.6			
16	11:45	18	10	7.52	86.2	0.6			
17	11:00	18	2	7.51	86.9	0.07			
18									
19									
20									
21	11:30	16.7	8	7.49	85	0.7			
22									
23	3:30	16.9	10	7.61	85.2	0.6			
24	9:00	13.1	12	7.46	87.3	0.6			
25									
26									
27	2:00	15.4	9	7.55	93.4	0.7			
28	3:00	15.4	10	7.6	88.3	0.7			
29	3:00	15.1	9	7.56	88.2	0.7			
30	11:00	14.6	4	7.59	89	0.7	1.35	93.9	1.16
31	1:00	15.3	10	7.52	89.9	0.7			

City Lab

Maxxam Lab

Water System Operating Conditions

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

Water System Operating Conditions

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. Wrenn