2014 ANNUAL WATER QUALITY REPORT

WESTHILLS WATER SYSTEM

Operated by SSL-Sustainable Services Ltd.

Prepared on: June 30th, 2015

SSL-Sustainable Services Ltd. is a provider of infrastructure services for the Westhills community in Langford, British Columbia. SSL was formed to provide water and, through its Community Energy System, thermal energy. For a community the size of Westhills, sustainability can come in different forms and SSL has been created to lead responsible development in energy and water delivery.

SSL-Sustainable Services Ltd.
957 Langford Parkway
Victoria, BC V9B 0A5
Phone: 250-391-7260
Website: www.SSL-BC.com
Email: info@SSL-BC.com

Contents

Executive Summary

The purpose of this report is to fulfill the requirements set out in the British Columbia Drinking Water Protection Act (DWPA)[1] by providing an overview of the Westhills Water System for the 2014 calendar year, including major infrastructure upgrades, regular system operations and maintenance, and results of water quality monitoring.

The Westhills Water System was established in 2010, timed with the initial land development and construction of new homes in the Westhills community in Langford, B.C. Through efforts by both Westhills Land Corp and the City of Langford, the Capital Regional District (CRD) granted Langford the ability to provide water to Westhills residents. The system was operated on an interim basis by CRD Integrated Water Services until September 2010, at which point SSL took over as the operator of the water distribution system under contract with the City of Langford.

As the Westhills system does not maintain its own water source or undertake any water treatment, it was interpreted for several years as falling under the operating permit for the regional water system granted to the CRD by the Vancouver Island Health Authority (VIHA). Significant system expansion eventually led VIHA to issue a separate operating permit for the Westhills Water System (see Appendix 3). While the system was already in compliance with the base requirements set out in the BC Drinking Water Protection Act and Regulation, the permitting process now formalizes our relationship with VIHA and provides an additional layer of oversight for water quality matters.

This report will demonstrate that all water-related construction work, operating procedures, and water quality monitoring currently meet or exceed standards and regulations set by the BC DWPA & DWPR, AWWA, VIHA, CRD Integrated Water Services, and the City of Langford.

Pressure Relief Valve

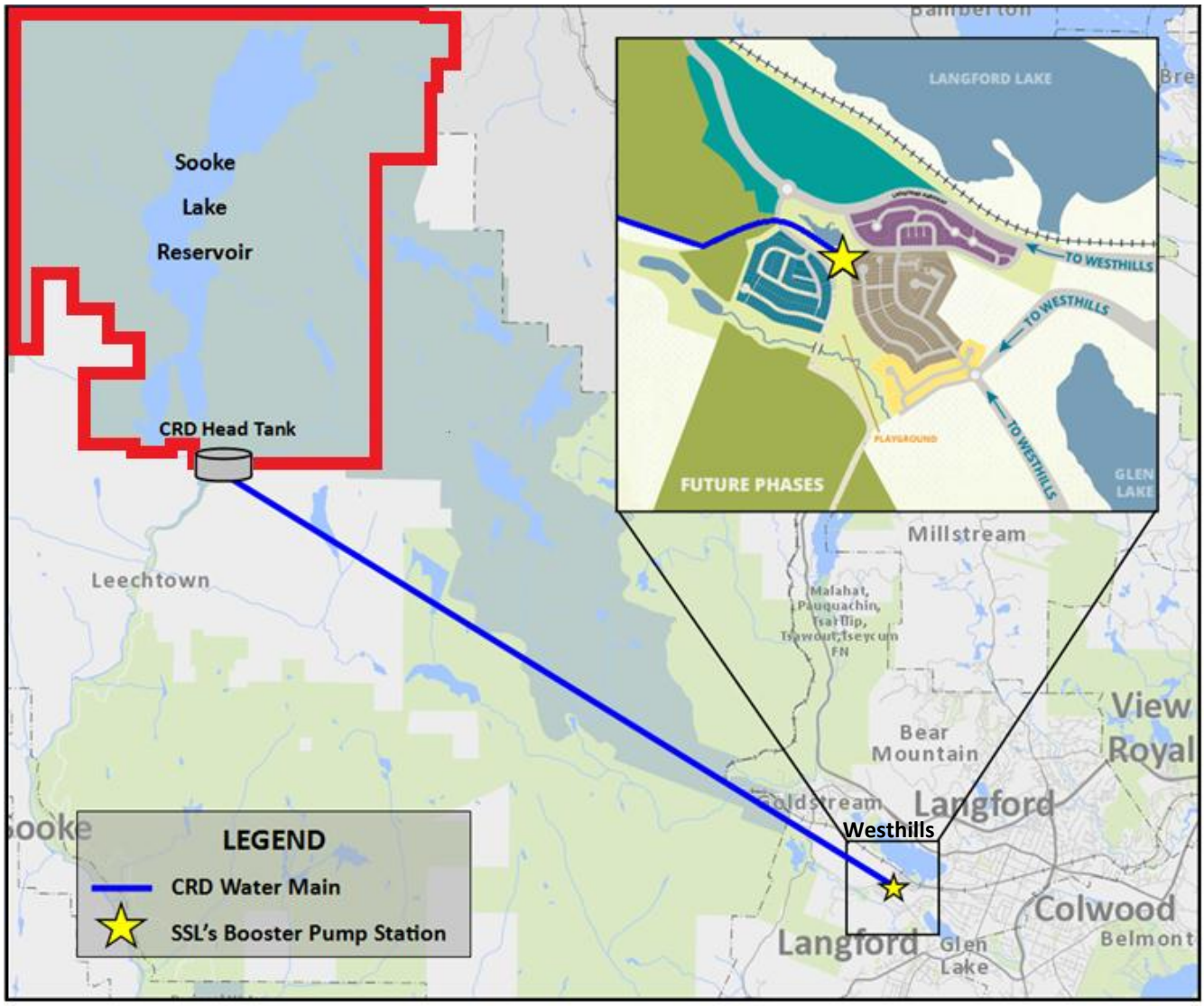
In 2014, the Westhills Water System undertook the following:

- Delivered 134,698 m³ of water to the Westhills community;
- Provided 93,134 m³ of water to Westhills residents;
- Provided 31,658 m³ of water usage to public works, parks and commercial space;
- Conducted 24 microbiological tests;
- Maintained 1 pressure relief valve;
- Maintained 38 fire hydrants to ensure water is available during an emergency;
- Detected zero leaks in water mains.

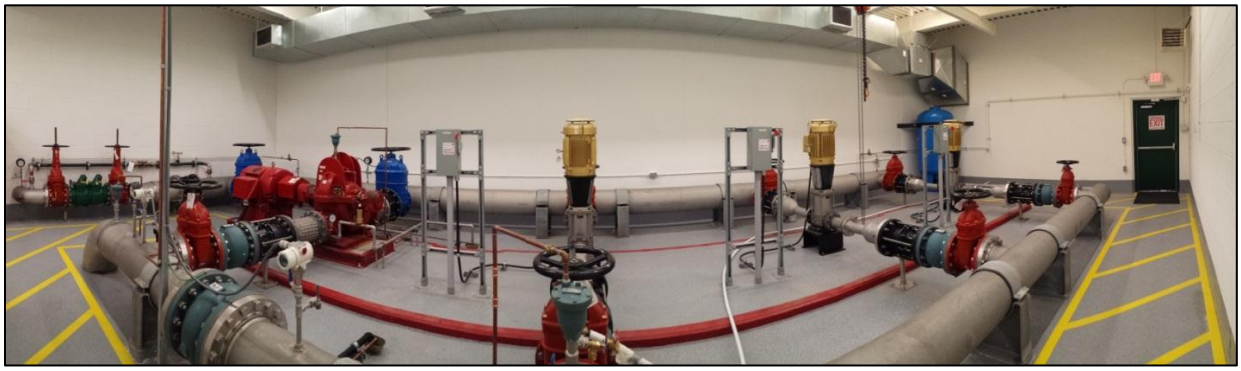
Did you know: 1 m³ = 1,000 L

[1] http://www.bclaws.ca/Recon/document/ID/freeside/00_01009_01

Westhills Source Water Site Map, 2014



System Overview



Booster Pump Station

The main water supply for the Westhills Water System is the Sooke Lake Reservoir[2], which also supplies water to the majority of the Capital Regional District (CRD). This water source is managed by CRD Integrated Water Services, including all disinfection and treatment processes – notably UV sterilization and chloramination.

The treated supply water then enters the Humpback Pressure Reducing Station located approximately two kilometers upstream from the Westhills Water System's Booster Pump Station (BPS). Bulk water is metered inside the Westhills BPS, representing the demarcation point between the regional water system operated by the CRD and the Westhills Water System operated by SSL–Sustainable Services Ltd.

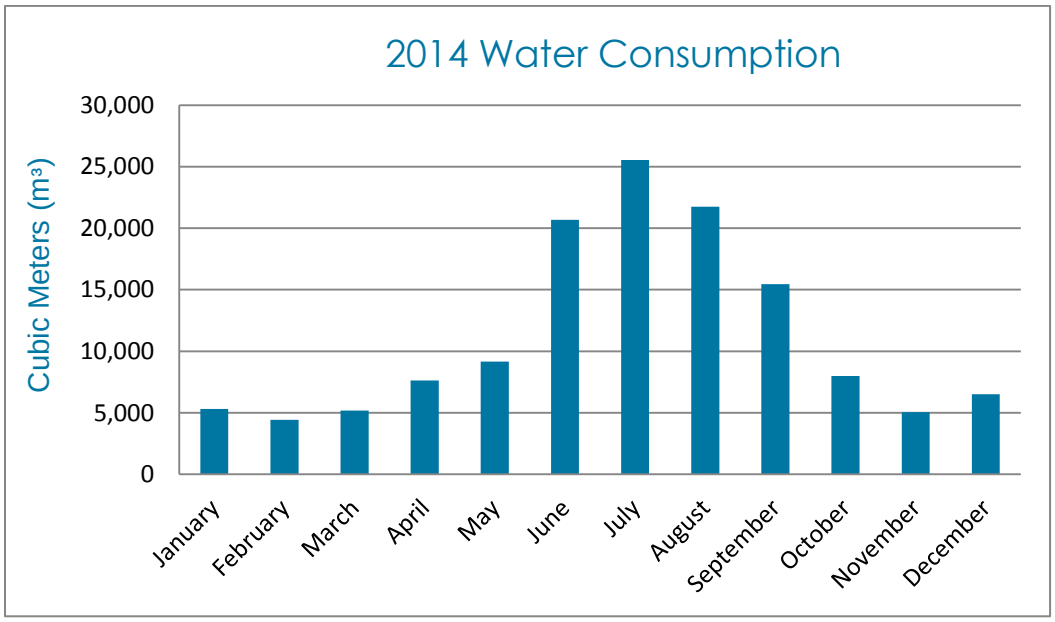
Water is then pumped through 3 high-efficiency variable speed pumps into a distribution system servicing 346 single family homes, 31 town homes, a 68 unit condominium as well as public irrigation and some commercial end uses. An automatic fire pump within the BPS provides fire flows when needed. The BPS also includes a standby diesel generator for emergency conditions. Fuel supply for this generator is fed from a day tank, which is in turn fed from a larger underground storage tank. An overview of significant water system assets can be seen in Table 1.

Table 1 – Overview of Westhills Water System

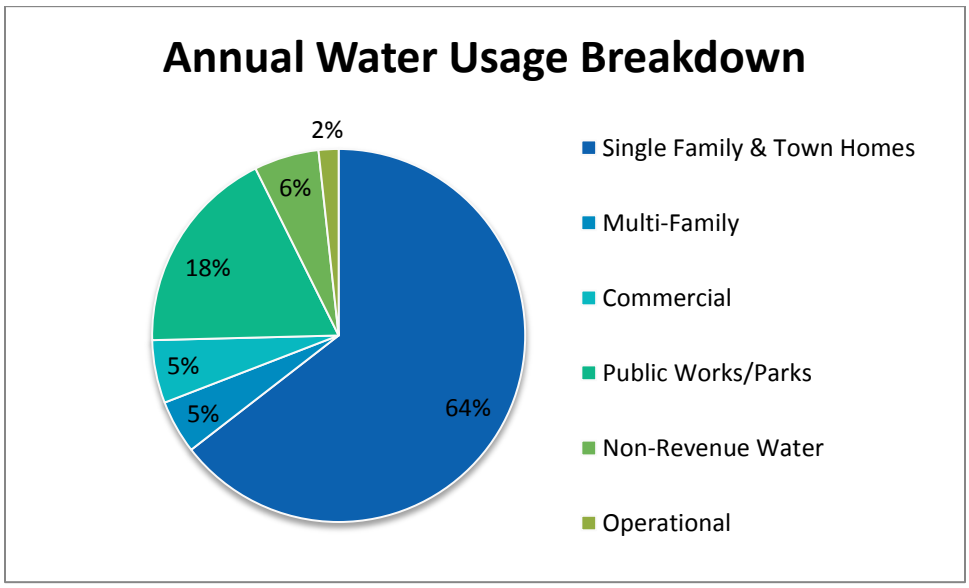
Water Assets	2014 Quantities
Hydrants	38
Pressure Relief Valve Chamber	1
Water Mains	5.96 (km)
Gate Valves	147
Flush Valves	19
Air Valves	6
Service Connections	399
Residential Connections	378
Households Served	445
Population Served	Approx. 1,800

[2] https://www.crd.bc.ca/about/data/sooke-lake-reservoir

Like many systems, water usage within Westhills more than triples in summer months compared to average winter usage, as seen in the graph below. Most of this increase is associated with the use of irrigation systems. As an ongoing land development site, large amounts of water are also used in summer months for construction and dust control purposes.



The graph below provides a breakdown by end use of all water provided in 2014. Through customer metering, SSL is able to track residential, commercial, parks and operational water usage, which accounts for most of the water which passes through the BPS. It is reasonable to assume that any unidentified portion of the annual water consumption is attributed to "water loss" within the system. This category, also called non-revenue water, includes things like water leaks, error margins for estimated water billings, hydrant usage for fire department training and potentially water theft.

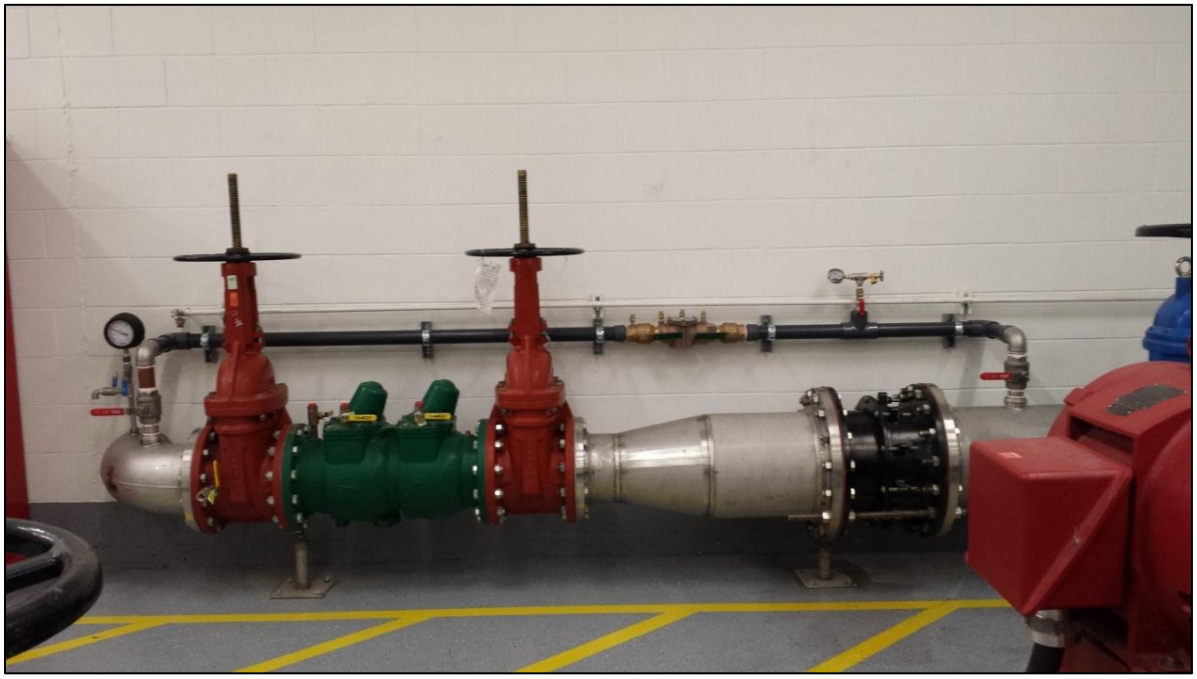


System Upgrades

In 2014, the Westhills Water System was extended by a total of 360 metres. New infrastructure included 10 gate valves, 2 flush valves, and 4 fire hydrants. This portion of the system is planned to provide water service for 31 new households, including 18 single family homes and 13 town homes.

A water bypass was also installed on the source water main in 2014. This will allow regular maintenance of a backflow prevention device on a pipe connecting the CRD water main to the Westhills distribution system without interrupting community water service. Specific details are outlined below:

Job Location: Westhills Water Booster Pump Station
Job Type: Feed line bypass installation – Two Phases
Date - Phase 1: August 28, 2014
Date - Phase 2: September 30, 2014
Parties Involved: SSL, IFC Water Solutions, Cottam Welding and CRD Water
Job Description:
Phase 1 of the bypass installation involved a full system shutoff to cut and weld two 2" threadolets into the main pump station service line and install isolation pipes with ball valve shutoffs. Phase 2 did not require any service interruptions and involved installing the bypass piping and a secondary backflow prevention device. Phase 2 was then followed by a repair to the 10" DCVA backflow prevention device in the BPS, which was also completed without any service interruptions.



Source Water Bypass

System Operation & Maintenance

The Westhills Water System is operated by SSL and its team of engineers, civil contractors and plant operators to implement the O&M program outlined below.

Monitoring: Booster Pump Station

- Weekly inspections of the BPS are carried out by a certified operator (EOCP Level III), with observations recorded in an on-site log book, including parameters like water temperature, total chlorine residual and pump run hours.
- SCADA/HMI System is remotely accessible from any computer connected to the internet and offers real time readings, trend logs and alarm tracking (authorized users only / protected by dual layer password protection).
- System Alarms are enunciated to a list of on-call personnel through an automated phone line system, which can operate without internet connectivity
- Live Video Cameras record any motion inside and outside the BPS, with both the live feed and recorded footage remotely accessible (authorized users only / protected by password and software registration)

Monitoring: Distribution System

- Water quality samples were regularly collected at the following minimum intervals:
    - MONTHLY: one bacteriological test for Total Coliform and E. Coli (CFU/100ml), along with total chlorine residual (ppm). (As of November 2014, these tests were completed on a weekly basis)
    - ANNUAL: Full spectrum VIHA potability analysis (bacteriological, metals, organics, etc.)

Maintenance: Booster Pump Station Equipment

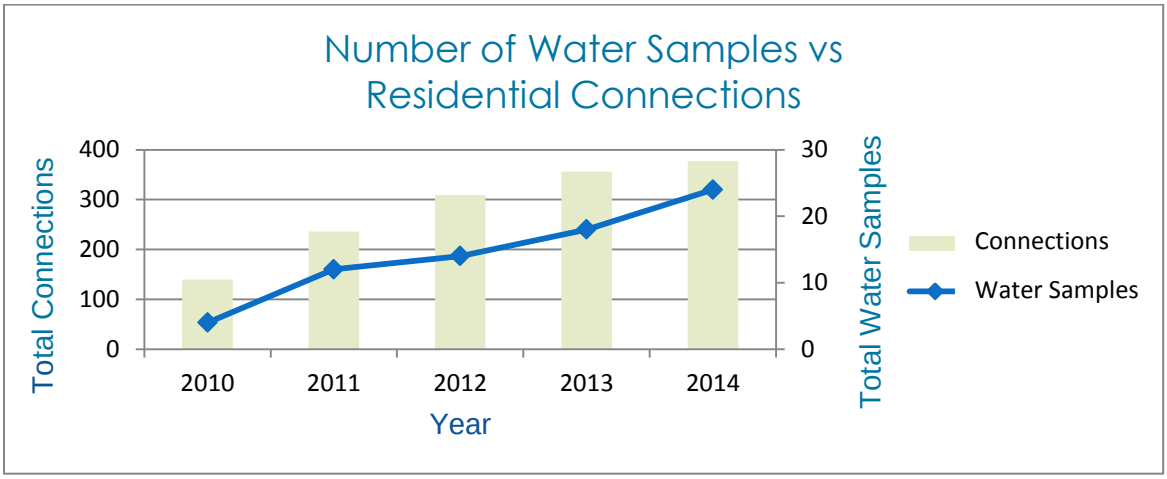
- Fire pump: weekly inspection and 30 minute manual test run; annual inspection and cleaning of pump shaft cooling channels, packing glands and casing gaskets
- Booster pumps: weekly inspection and recording of run hours
- Diesel generator: weekly inspection and automated test run; annual full servicing which includes oil/filter change, readiness test and full loadbanking (report filed on site and at SSL office)
- Pressure tank: annual inspection and servicing
- Backflow prevention devices: annual test by certified BFP tester (repair or replace as needed)
- Building electrical systems: annual inspection and report completed by FSR listed on Electrical Operating Permit
- Full hard copy sets of as-built and shop drawings are located at BPS, SSL head office, and with water system operator

Maintenance: Distribution System

- Unidirectional flushing: Full system (annual); low-demand or dead-end sections (semi-annual)
- Fire hydrants: Pressure testing, painting, physical inspection and maintenance (annual); data reported to fire department, see Appendix 2.
- Valve exercising: Open/close all system valves to confirm operational; check all box covers and arrow painting (annual)
- Water meters: Physical inspection for leaks or bypasses; add mulch for frost protection (annual); Accuracy audit and verification (per manufacturer's specification – approx. 10-15 years

Water Quality Monitoring

In 2014, SSL collected samples on a regular basis at 10 dedicated sampling sites. These sites are strategically located throughout the Westhills Water System to give a good representation of the water quality across the distribution network. In 2014, 24 water samples were collected, a number which has steadily increased over the years to keep up with the overall growth of the Westhills Water System and community. All samples were sent for analysis at Maxxam Analytics laboratory, where bacteriological tests were conducted for both total coliform and *E. coli*. The presence of these organisms in drinking water indicates that the water may be contaminated and may contain potentially harmful bacteria, viruses or parasites.



Total coliforms are a group of bacteria that are usually found on or in plants, soils, water, and in the intestines of humans and warm-blooded animals. Total coliforms can be used to help determine the efficacy of a drinking water treatment system[3].

If total coliforms are detected in a water sample, the positive site(s) should be immediately resampled. If total coliforms are detected in consecutive samples, or more than 10% of samples collected in a given sampling period, further investigation is required. This investigation will be coordinated by SSL, involving the water system operator and project engineer as required, and may include flushing or disinfection of the supply system and sampling of adjacent sites. CRD Integrated Water Services will also be notified in order to confirm results against water system supply quality.

***Escherichia coli* (*E. coli*)** is a member of the coliform group of bacteria that are usually found in the intestines of humans and warm-blooded animals. It is not naturally found on or in other environments such as plants, soils and water. The presence of *E. coli* in a water sample is a good indicator of recent faecal contamination and can suggest a possible danger to public health[3].

If *E. coli* is detected in a water sample, SSL will immediately notify the water system operator, project engineer and VIHA. The positive site(s) and adjacent sites will be immediately resampled and a boil water advisory may be issued (subject to direction from VIHA). If a consecutive sample is positive for *E.*

[3] Health Canada, Guidelines for Canadian Drinking Water Quality (2012)

coli, a boil water advisory will be issued and corrective actions undertaken in consultation with VIHA (see Appendix 4). CRD Integrated Water Services will also be notified.

2014 Test Results

In 2014, 22 of the 24 water quality results met the drinking water requirements for *E. coli* and total coliforms. In the case of both failed water quality results on September 5, 2014 and December 2, 2014, a resample of the same site resulted in a passing water quality result. An overview of 2014 water quality results can be seen in Table 2.

Table 2 – 2014 Water Quality Results

Sample Date	Sample Site	CL2 Res (ppm)	Total Coliforms (CFU/100mL)	*E. coli* (CFU/100mL)	Temperature (°C)
7-Jan-14	Langford Parkway	N/A	<1	<1	9.0
7-Jan-14	Clearwater	N/A	<1	<1	9.0
11-Feb-14	Dornier	N/A	<1	<1	9.0
12-Mar-14	Parkdale Creek	N/A	<1	<1	16.0
10-Apr-14	Artesian	N/A	<1	<1	15.0
13-May-14	Grob	N/A	<1	<1	14.0
12-Jun-14	3088 Dornier Rd	N/A	<1	<1	16.0
12-Jun-14	Arado	N/A	<1	<1	16.0
15-Jul-14	Langford Parkway	N/A	<1	<1	15.0
5-Sep-14	Artesian	0.85	1	<1	14.0
15-Sep-14	Artesian (resample)	0.94	<1	<1	22.0
15-Sep-14	Pump Station	1.02	<1	<1	22.0
15-Sep-14	Pump Station	1.01	<1	<1	22.0
8-Oct-14	Parkdale Creek	0.64, 0.68	<1	<1	19.0
4-Nov-14	Clearwater	N/A	<1	<1	14.0
4-Nov-14	Clearwater	N/A	<1	<1	14.0
17-Nov-14	Grob	1.27, 1.23	<1	<1	11.0
24-Nov-14	Dornier	0.89, 0.83	<1	<1	13.0
2-Dec-14	Phase 3, PF 1, Lot 11	0.75, 0.75	1	<1	15.0
4-Dec-14	Phase 3, PF 1, Lot 11 (resample)	0.49, 0.50	<1	<1	12.0
8-Dec-14	Arado	0.72, 0.73	<1	<1	13.0
15-Dec-14	3088 Dornier Rd	1.04, 1.03	<1	<1	11.0
22-Dec-14	Langford Parkway	1.20, 1.13	<1	<1	16.0
29-Dec-14	Artesian	1.09, 1.01	<1	<1	10.0

2014 VIHA Potability Analysis

In addition to routine bacteriological testing, SSL also completes an annual full spectrum analysis of water in the Westhills distribution system. This analysis measures dozens of parameters which are not practical for routine testing, including metals, nutrients and various physical properties. While this is not required under the DWPA or our operating permit, we see value in the long term maintenance of such records. The CRD also performs this analysis on the regional water source each year which allows us to make helpful comparisons between our distribution system and the primary water supply. The results of our 2014 analysis are included in Appendix 5.

2014 Water Quality Complaints

Six water quality complaints were received by SSL from homes within Westhills in 2014. Each complaint was investigated and all were found to be directly caused by the fixtures within the home and not related to the water supply.

Conclusion

In 2014, the Westhills Water System exceeded the requirements set out in the BC Drinking Water Protection Act. With the support of its core staff and team of engineers, civil contractors and plant operators, SSL was able to operate the drinking water system in a safe and reliable manner while efficiently performing routine maintenance and system upgrades.

Southern Vancouver Island is extremely fortunate to enjoy high-quality drinking water resources. This has largely been made possible through efforts by the CRD and VIHA, who we acknowledge as valuable partners in the ongoing delivery of safe, clean water to our customers. We are proud of our role in providing a critical utility to the vibrant and growing community of Westhills and look forward to many years of continued service.

Kyle Taylor
Manager

SSL-Sustainable Services Ltd.
250-391-7260
ktaylor@SSL-BC.com

Appendices

Appendix 1: SSL Water Main Book

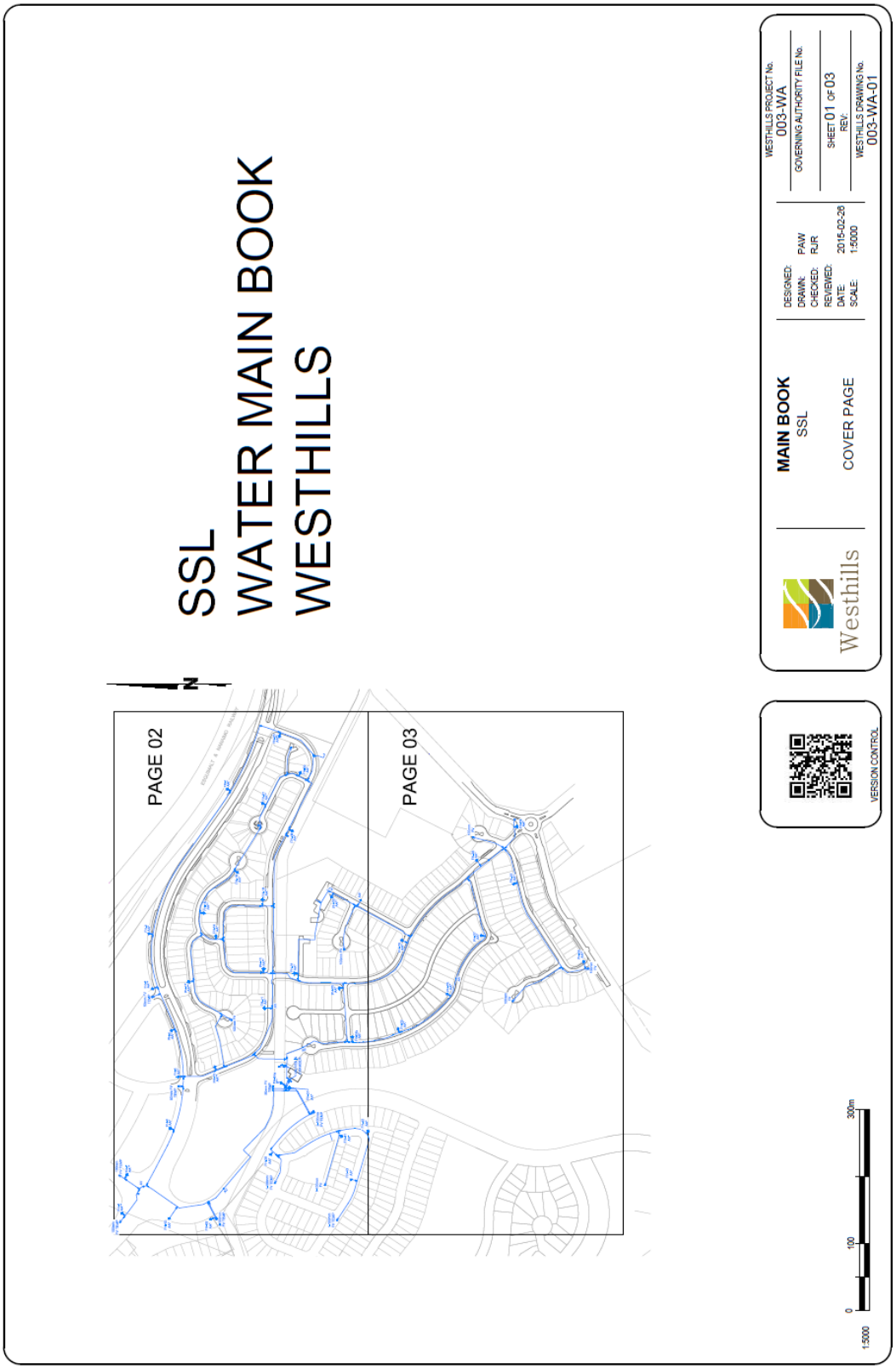
Appendix 2: Hydrant Maintenance Sheet

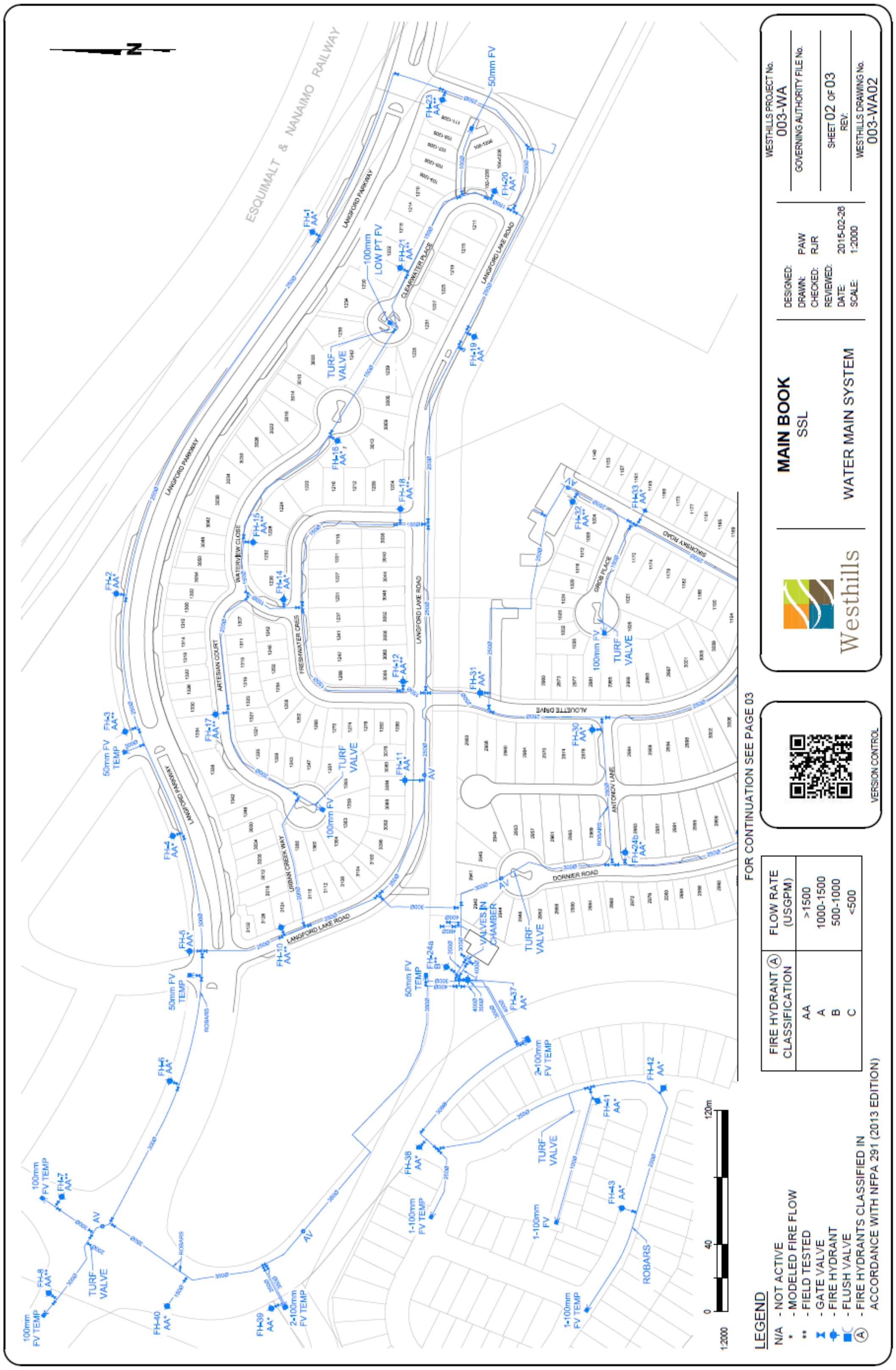
Appendix 3: VIHA Operating Permit

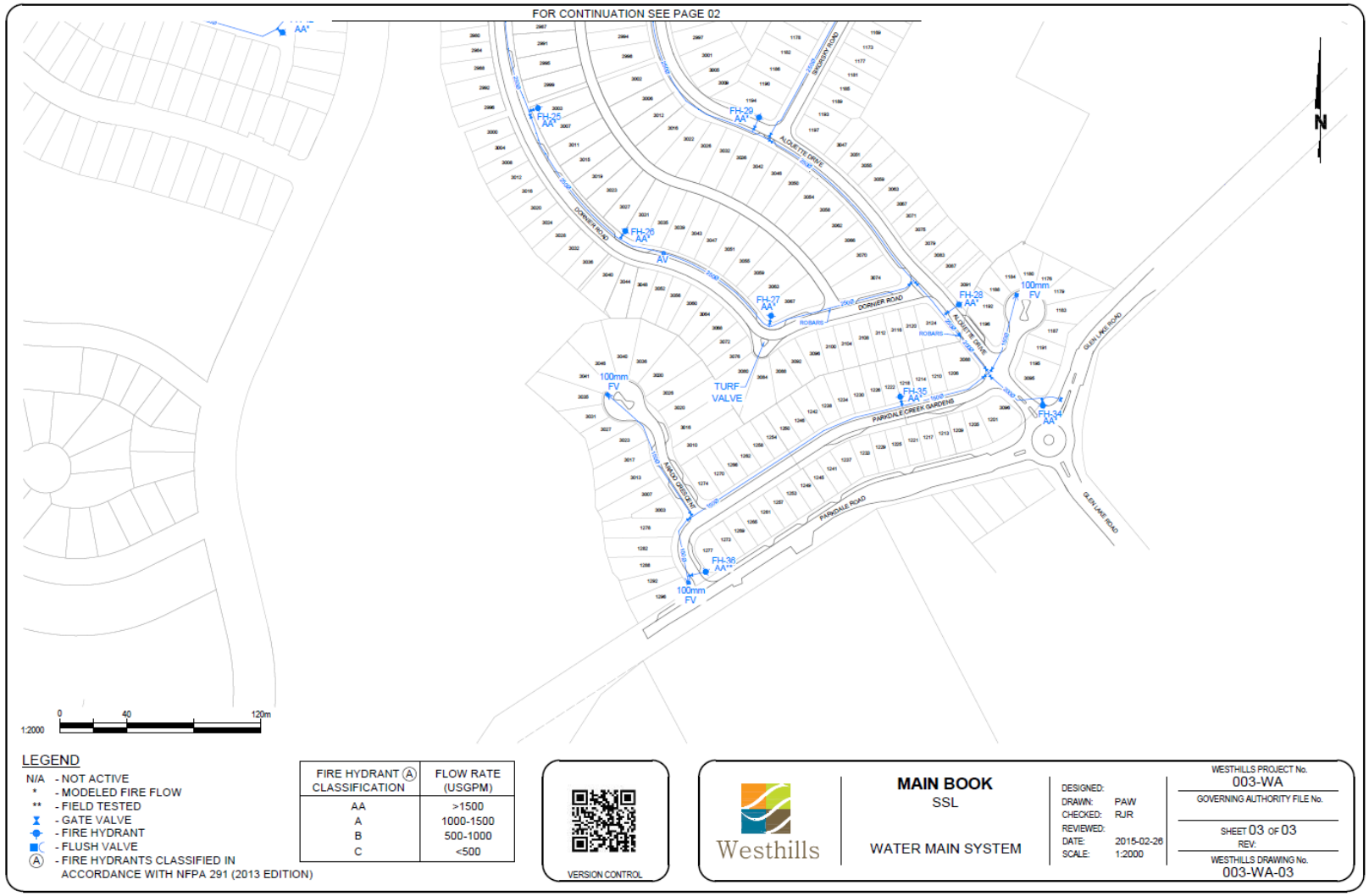
Appendix 4: Sample Drinking Water Quality Advisories

Appendix 5: Full Spectrum Potability Analysis

Appendix 1: SSL Water Main Book




MAIN BOOK
SSL
WATER MAIN SYSTEM
Westhills
WESTHILLS PROJECT No. 003-WA
GOVERNING AUTHORITY FILE No.
SHEET 02 OF 03
REV:
WESTHILLS DRAWING No. 003-WA02
DESIGNED: PAW
DRAWN: RJR
CHECKED:
REVIEWED:
DATE: 2015-02-26
SCALE: 1:2000
VERSION CONTROL
FOR CONTINUATION SEE PAGE 03
FIRE HYDRANT CLASSIFICATION
FLOW RATE (USGPM)
AA >1500
A 1000-1500
B 500-1000
C <500
LEGEND
N/A - NOT ACTIVE
* - MODELED FIRE FLOW
** - FIELD TESTED
- GATE VALVE
- FIRE HYDRANT
- FLUSH VALVE
- FIRE HYDRANTS CLASSIFIED IN ACCORDANCE WITH NFPA 291 (2013 EDITION)
ESQUIMALT & NANAIMO RAILWAY
LANGFORD PARKWAY
LANGFORD LAKE ROAD
CLEARWATER PLACE
WATERVIEW CLOSE
ARTESIAN COURT
FRESHWATER CRES
URBAN CREEK WAY
ALOUETTE DRIVE
ANTONOV LANE
DORNIER ROAD
GROB PLACE
SIKORSKY ROAD
VALVES IN CHAMBER
TURF VALVE
ROBARS



LEGEND

N/A	- NOT ACTIVE
*	- MODELED FIRE FLOW
**	- FIELD TESTED
	- GATE VALVE
	- FIRE HYDRANT
	- FLUSH VALVE
Ⓐ	- FIRE HYDRANTS CLASSIFIED IN ACCORDANCE WITH NFPA 291 (2013 EDITION)

FIRE HYDRANT Ⓐ CLASSIFICATION	FLOW RATE (USGPM)
AA	>1500
A	1000-1500
B	500-1000
C	<500

VERSION CONTROL

Westhills

MAIN BOOK
SSL

WATER MAIN SYSTEM

DESIGNED:
DRAWN: PAW
CHECKED: RJR
REVIEWED:
DATE: 2015-02-26
SCALE: 1:2000

WESTHILLS PROJECT No.
003-WA
GOVERNING AUTHORITY FILE No.
SHEET 03 OF 03
REV:
WESTHILLS DRAWING No.
003-WA-03

Appendix 2: Hydrant Maintenance Sheet

Date	Hydrant	Pressure (psi)	Requires Paint?	Notes
18-Apr-14	FH #1	110	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #2	100	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #3	86	N	Pressure test - passed, is in good shape. Replaced rubber gaskets. Requires valve key extension to open and close fire hydrant valve.
18-Apr-14	FH # 4	85	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #5	84	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #6	80	Y	Pressure test - passed, is in good shape.
18-Apr-14	FH #7	78	Y	Pressure test - passed, is in good shape. Replaced rubber gaskets.
18-Apr-14	FH #8	78	Y	Pressure test - passed, is in good shape. Replaced rubber gaskets.
18-Apr-14	FH #10	80	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #11	69	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #12	70	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #14	79	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #15	90	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #16	100	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #17	75	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #18	80	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #19	90	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #20	100	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #21	105	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #24A	38	N	Pressure not done due to temp irrg service on lead. (Hydrant was #22 on the 2013 report.)
18-Apr-14	FH #23	110	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #24B	78	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #25	78	N	Pressure test - passed, is in good shape. Replaced rubber gaskets.
18-Apr-14	FH #26	70	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #27	80	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #28	84	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #29	68	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #30	68	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #31	68	N	Pressure test - passed, is in good shape. Replaced rubber gaskets.
18-Apr-14	FH #32	57	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #33	60	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #34	98	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #35	96	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #36	94	N	Pressure test - passed, is in good shape.
18-Apr-14	FH #37	80	Y	Pressure test - passed, is in good shape.
18-Apr-14	FH #38	74	Y	Pressure test - passed, is in good shape.
18-Apr-14	FH # 39	70	Y	Pressure test - passed, is in good shape.
18-Apr-14	FH #40	70	Y	Pressure test - passed, is in good shape. Replaced rubber gaskets.

Appendix 3: VIHA Operating Permit

VANCOUVER ISLAND health authority

HEALTH PROTECTION

PERMIT
to OPERATE

A WATER SUPPLY SYSTEM

Water System Name:	**WESTHILLS WATER SYSTEM**
Premises Number:	64010259
Premises Address:	204 - 957 Langford Parkway Victoria, BC V9B 0A5
Water System Owner:	SSL - Sustainable Services Ltd.

SSL - Sustainable Services Ltd. is hereby permitted to operate the above potable water supply system and is required to operate this system in accordance with the Drinking Water Protection Act and in accordance with the conditions set out in this operating permit and conditions established as part of any construction permit.

The water supply system for which this operating permit applies is generally described as:

Service Delivery Area:	Westhills
Source Water:	**CRD**
Water Treatment methods are:	None
Water Disinfection methods are:	UV & Chloramination
Number of Connections	301-10,000 Connections - DWT

Date: January 13, 2015

Issued By: Rory Beise
Environmental Health Officer

This permit must be displayed in a conspicuous place and is not transferable

island health
Expires March 2015
5161

Appendix 4: Sample Drinking Water Quality Advisory

BOIL WATER NOTICE

SSL-Sustainable Services Ltd. (SSL), in consultation with the Vancouver Island Health Authority (VIHA), has issued a BOIL WATER NOTICE for the Westhills Water Distribution System. This Notice is effective immediately and covers all residents of Westhills and those who obtain water from the Westhills Water Distribution System (Facility #1948)

Until further notice, water from the Westhills Water Distribution System should be held at a rolling boil for one (1) minute and cooled before it is consumed. For your safety, only boiled or bottled water should be used for drinking, making ice or fountain drinks, washing dishes, brushing teeth, or preparing foods that will not be cooked.

The following checked statement best describes the situation that triggered this notice:

- Recent water test show the presence of unacceptable levels of bacteria. Boiling the water will make it safe to drink.
- Turbidity in the water system has risen to unacceptable levels as a result of _____. High turbidity can interfere with disinfection and may signal the presence of disease causing organisms. Boiling the water will make it safe to drink.
- The water system recently experienced a _____, which may make the water unsafe to drink. Boiling the water will make it safe to drink.

SSL and VIHA are working together to resolve the situation. Once the water is safe to drink, this Boil Water Notice will be rescinded.

Updates will be provided regularly to Westhills residents' _____ as well as by postings in locations throughout the community and online at www.SSL-BC.com. Updates can also be obtained by contacting one of:

SSL-Sustainable Services Ltd. – 250-391-7260
Island Flow Control Water Solutions Ltd. – 250-361-5503

The Vancouver Island Health Authority has additional information about boil water notices online at http://www.viha.ca/mho/water/boil_water

Thank you for your patience and cooperation. For further information, please contact:

Name:
Phone:
Email:
Date:

DO NOT USE WATER

SSL-Sustainable Services Ltd. (SSL), in consultation with the Vancouver Island Health Authority (VIHA), has issued a DO NOT USE WATER Notice for the Westhills Water Distribution System. This Notice is effective immediately and covers all residents of Westhills and those who obtain water from the Westhills Water Distribution System (Facility #1948)

Until further notice, do not drink or use water from the Westhills Water Distribution System. Boiling the water will not make it safe to drink.

The following statement best describes the situation that triggered this notice:

SSL and VIHA are working together to resolve the situation. Once the water is safe to drink, this DO NOT USE WATER Notice will be rescinded.

Updates will be provided regularly to Westhills residents _____ as well as by postings in locations throughout the community and online at www.SSL-BC.com. Updates can also be obtained by contacting one of:

SSL-Sustainable Services Ltd. – 250-391-7260
Island Flow Control Water Solutions Ltd. – 250-361-5503

Thank you for your patience and cooperation. For further information, please contact:

Name:
Phone:
Email:
Date:

Appendix 5: Full Spectrum Potability Analysis

RDL = Reportable Detection Limit

N/A = Not Applicable

Criteria A = Maximum Acceptable Concentration (MAC)
Criteria B = Aesthetic Objectives (AO)
Criteria C = Operational Guidance Values (OG)

VIHA POTABILITY WITH MICRO AND CV HG (WATER)

Sampling Date					2014/11/06 09:45	
COC Number					V011756	
	Units	**Criteria A**	**Criteria B**	**Criteria C**	**SAMPLE RESULTS**	**RDL**
CONVENTIONALS						
Dissolved Nitrate (N)	mg/L	**10**	-	-	0.035	0.010
Dissolved Nitrite (N)	mg/L	**1**	-	-	<0.010	0.010
Misc. Inorganics						
Dissolved Chloride (Cl)	mg/L	-	250	-	4.66	0.50
Dissolved Fluoride (F)	mg/L	**1.5**	-	-	<0.010	0.010
Dissolved Sulphate (SO4)	mg/L	-	500	-	1.67	0.50
Calculated Parameters						
Total Hardness (CaCO3)	mg/L	-	-	-	19.7	0.50
Misc. Inorganics						
Alkalinity (Total as CaCO3)	mg/L	-	-	-	13.6	0.5
Total Organic Carbon (C)	mg/L	-	-	-	2.68	0.50
Alkalinity (PP as CaCO3)	mg/L	-	-	-	<0.5	0.5
Bicarbonate (HCO3)	mg/L	-	-	-	16.6	0.5
Carbonate (CO3)	mg/L	-	-	-	<0.5	0.5
Hydroxide (OH)	mg/L	-	-	-	<0.5	0.5
Nutrients						
Total Ammonia (N)	mg/L	-	-	-	0.12	0.0050
Total Organic Nitrogen (N)	mg/L	-	-	-	0.169	0.020
Nitrate plus Nitrite (N)	mg/L	-	-	-	0.04	0.01
Total Nitrogen (N)	mg/L	-	-	-	0.321	0.020
Physical Properties						
Conductivity	uS/cm	-	-	-	47	1
pH	pH	-	6.5:8.5	-	7.0	N/A
Physical Properties						
Total Dissolved Solids	mg/L	-	500	-	43	10
Turbidity	NTU	**see remark**	see remark	see remark	0.3	0.1
Elements						

Total Mercury (Hg)	ug/L	**1**	-	-	0.016	0.010
Total Metals by ICPMS						
Total Aluminum (Al)	ug/L	**-**	-	100	6.5	3.0
Total Antimony (Sb)	ug/L	**6**	-	-	<0.50	0.50
Total Arsenic (As)	ug/L	**10**	-	-	<0.10	0.10
Total Barium (Ba)	ug/L	**1000**	-	-	4.2	1.0
Total Beryllium (Be)	ug/L	**-**	-	-	<0.10	0.10
Total Bismuth (Bi)	ug/L	**-**	-	-	<1.0	1.0
Total Boron (B)	ug/L	**5000**	-	-	<50	50
Total Cadmium (Cd)	ug/L	**5**	-	-	<0.010	0.010
Total Chromium (Cr)	ug/L	**50**	-	-	<1.0	1.0
Total Cobalt (Co)	ug/L	**-**	-	-	<0.50	0.50
Total Copper (Cu)	ug/L	**-**	1000	-	4.41	0.20
Total Iron (Fe)	ug/L	**-**	300	-	43.1	5.0
Total Lead (Pb)	ug/L	**10**	-	-	0.81	0.20
Total Manganese (Mn)	ug/L	**-**	50	-	6.8	1.0
Total Molybdenum (Mo)	ug/L	**-**	-	-	<1.0	1.0
Total Nickel (Ni)	ug/L	**-**	-	-	<1.0	1.0
Total Selenium (Se)	ug/L	**10**	-	-	<0.10	0.10
Total Silicon (Si)	ug/L	**-**	-	-	1860	100
Total Silver (Ag)	ug/L	**-**	-	-	<0.020	0.020
Total Strontium (Sr)	ug/L	**-**	-	-	17.5	1.0
Total Thallium (Tl)	ug/L	**-**	-	-	<0.050	0.050
Total Tin (Sn)	ug/L	**-**	-	-	<5.0	5.0
Total Titanium (Ti)	ug/L	**-**	-	-	<5.0	5.0
Total Uranium (U)	ug/L	**20**	-	-	<0.10	0.10
Total Vanadium (V)	ug/L	**-**	-	-	<5.0	5.0
Total Zinc (Zn)	ug/L	**-**	5000	-	<5.0	5.0
Total Zirconium (Zr)	ug/L	**-**	-	-	<0.50	0.50
Total Calcium (Ca)	mg/L	**-**	-	-	5.72	0.050
Total Magnesium (Mg)	mg/L	**-**	-	-	1.31	0.050
Total Potassium (K)	mg/L	**-**	-	-	0.164	0.050
Total Sodium (Na)	mg/L	**-**	200	-	1.84	0.050
Total Sulphur (S)	mg/L	**-**	-	-	<3.0	3.0
Microbiological Param.						
Heterotrophic Plate Count	CFU/mL	**-**	-	-	<1	1
Parameter						
Iron Bacteria	CFU/mL	**-**	-	-	<25	25
Sulphate reducing bacteria	CFU/mL	**-**	-	-	<200	200
Microbiological Param.						
Total Coliforms	CFU/100mL	**<1**	-	-	<1	1

E. coli	CFU/100mL	**<1**	-	-	<1	1
Parameter						
Langelier Index (@ 4.4C)	N/A	-	-	-	-2.94	N/A
Langelier Index (@ 60C)	N/A	-	-	-	-1.90	N/A
Saturation pH (@ 4.4C)	N/A	-	-	-	9.96	N/A
Saturation pH (@ 60C)	N/A	-	-	-	8.92	N/A
MISCELLANEOUS						
Sulphide	mg/L	-	0.05	-	0.0054	0.0050