The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

ANNUAL REPORT

2013

Vancouver Coastal Health

The Municipality of the Village of Lions Bay

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GENERAL DESCRIPTION

The Village of Lions Bay supplies potable water to approximately 1600 residents with 591 service connections. Water is sourced from two local creeks, treated with UV disinfection and chlorination, and then distributed via five storage tanks and thirteen kilometres of water mains to the residents. This report provides an overview of the water quality at the Village of Lions Bay during 2013.

SOURCE WATER

The community's watershed lands include Magnesia Creek drainage (421 hectares), Alberta Creek drainage (51 hectares), Harvey Creek drainage (635 hectares), and Rundle Creek drainage (20 hectares). Water is drawn from the intakes on Harvey Creek and Magnesia Creek.

Challenges

The Village draws its water from surface sources that are subject to fluctuating turbidity levels. This fluctuation in raw water turbidity, presents a challenge to ensure that distributed water turbidity and residual chlorine levels, are not adversely affected. Water intakes are typically checked once or twice a week, and several times a day when the weather dictates. Water Treatment Plants with Ultra Violet (UV) and Chlorine Disinfection are checked once daily from Monday to Friday.

Test Results

The Village tests untreated source water for turbidity once daily from Monday to Friday, and performs more extensive testing twice a year for general water chemistry, hardness, metals and contaminants including organic compounds. The results for source water during 2013 are presented and discussed below.

Turbidity Raw Water

	RAW WATER 2013	
	Harvey Creek	**Magnesia Creek**
Count	254	254
Maximum Result (NTU)	5.14	16.00
Minimum Result (NTU)	0.11	0.12
Average (NTU)	0.45	0.37
Number of samples < 1 NTU	238	246
Number of samples > 1 NTU but < 5 NTU	15	7
Number of samples > 5 NTU	1	1
Percentage of samples < 1 NTU	93.70	96.85
Percentage of samples > 1 NTU but < 5 NTU	5.91	2.76
Percentage of samples > 5 NTU	0.39	0.39

The Canadian Drinking Water Guidelines and the US Environmental Protection Agency, state that the turbidity of an unfiltered raw water supply should generally be around 1 NTU, and should not exceed 5 NTU. As can be seen from the above summary table, raw water turbidity during 2013 was generally acceptable, with an average of 0.45 NTU for Harvey and 0.37 NTU for Magnesia.

Due to heavy rain, the creeks Harvey and Magnesia had high Turbidity on Friday, August 30, 2013, and due to this situation the Village issued a Boil Water Advisory and the Vancouver Coastal Health Officer was informed about it.

On Tuesday, September 3, 2013 water samples for the entire water distribution system were delivered at the Laboratory. On Wednesday September 4, 2013, the water sample results were received and all of them were negative. The Vancouver Coastal Health Officer was informed about it on September 5, 2013 and he authorized to lift the Boil Water Advisory.

Due to this heavy rain, Magnesia Tank had one Turbidity result of 11.5 NTU on August 30, 2013, and Harvey Tank had one Turbidity result of 9.40 NTU on September 2, 2013. After these days the Turbidity on both Tanks returned to normal.

Metals and General Chemistry
See results in appendix "C"

WATER TREATMENT

Treatment
Currently, no filtration is applied to the raw water in Lions Bay. Disinfection using an Ultra Violet (UV) system and Chlorine injection are the two treatments applied. The Village has one Water Treatment Plant for Harvey creek and another Water Treatment Plant for Magnesia creek. Turbidity and residual chlorine tests are performed at these locations and in sample stations in the Distribution System approved by Vancouver Coastal Health.

Challenges
In times of severe weather, the Water Operator increases the frequency of testing and adjustment of the injection rates, in order to compensate for any fluctuating chlorine demand caused by varying turbidity levels. Chlorine residuals in the water exiting the storage tanks are tested sometimes twice or more per day to ensure that it is safe for consumption.

Test Results
The Village tests treated water exiting the Plant storage tanks for turbidity and residual chlorine daily from Monday to Friday (see Appendix "B"). These results are presented and discussed below.

Turbidity

	TREATED WATER 2013	
	HARVEY TANK	MAGNESIA TANK
Count	254	254
Maximum Result (NTU)	9.40	11.50
Minimum Result (NTU)	0.13	0.12
Average (NTU)	0.34	0.40
Number of samples < 1 NTU	251	245
Number of samples > 1 NTU but < 5 NTU	2	8
Number of samples > 5 NTU	1	1
Percentage of samples < 1 NTU	98.82	96.46
Percentage of samples > 1 NTU but < 5 NTU	0.79	3.15
Percentage of samples > 5 NTU	0.39	0.39

The Canadian Drinking Water Guidelines and the US Environmental Protection Agency state that the turbidity of an unfiltered treated water supply should generally be around 1 NTU, and should not exceed 5 NTU. As can be seen from the above summary table, treated water turbidity during 2013 was generally acceptable for unfiltered treated water, with an average of 0.34 NTU for Harvey and 0.40 NTU for Magnesia.

Chlorine Residual

	TREATED WATER 2013	
	HARVEY TANK	MAGNESIA TANK
Count	254	254
Maximum Result (ppm)	1.15	1.25
Minimum Result (ppm)	0.25	0.17
Average (ppm)	0.87	0.88
No. of Samples Outside Limits	0	1
% Samples Outside Limits	0.00	0.39

The generally agreed Minimum Acceptable Residual Chlorine level in treated drinking water is 0.2 ppm, as recommended by Vancouver Coastal Health. The generally agreed Maximum Acceptable Residual Chlorine level in treated drinking water is 4.0 ppm as recommended by the US Environmental Protection Agency.

As shown in the above analysis, only one sample for Magnesia Tank had a chlorine residual less than 0.2 ppm (August 30, 2013 with 0.17 ppm). This indicates that 100.00% of samples in Harvey and 99.61% of samples in Magnesia had acceptable levels of chlorine residual during 2013.

When less than 0.2 ppm chlorine residual is noted in the Distribution System, some hydrants in the system are flushed until a minimum chlorine residual of 0.2 ppm or more is obtained.

WATER DISTRIBUTION SYSTEM

Storage

Approximately 499,000 imperial gallons (IG) of water are consumed per day for the whole system. There are currently 8 water storage tanks throughout the system. These include: Harvey (400,000 IG), Ocean view (100,000 IG, out of service during 2013), Magnesia (100,000 IG), Upper Bayview Phase 4 (20,000 IG), Upper Bayview Phase 5 (25,000 IG), Highway (21,000 IG), South Sunset (40,000 IG, out of service during 2013), and Brunswick Beach (35,000 IG, out of service during 2013).

Distribution

The Village of lions Bay's location on the side of a mountain requires that water pressures be controlled by 13 PRV stations, for Harvey: one at the Plant and six in the Distribution System, and for Magnesia: one at the Plant and five in the Distribution System. Approximately 13 kilometres of water mains of a variety of ages and constructed from a variety of materials including asbestos cement, ductile iron, cast iron, and PVC make up the Village's distribution system.

Test Results

Samples are taken daily from Monday to Friday from six sampling sites in the middle and end of the distribution system and tested for turbidity and residual chlorine (see Appendix "B"). On Mondays, samples from these sites are sent to the laboratory to be tested for Total and Fecal Coliforms, and E. Coli. In addition, metals levels and general chemistry are tested twice a year at up to eleven locations in the distribution system. The results of these samples are presented in appendix "C".

Harvey Turbidity

	HARVEY 2013			
	PRV-3	**CAFE**	**LB AVENUE**	**KELVIN G.**
Count	254	254	254	254
Maximum Result (NTU)	2.05	3.45	0.96	1.32
Minimum Result (NTU)	0.08	0.11	0.10	0.12
Average (NTU)	0.33	0.31	0.24	0.24
Number of samples < 1 NTU	250	250	254	253
Number of samples > 1 NTU but < 5 NTU	4	4	0	1
Number of samples > 5 NTU	0	0	0	0
Percentage of samples < 1 NTU	98.43	98.43	100.00	99.61
Percentage of samples > 1 NTU but < 5 NTU	1.57	1.57	0.00	0.39
Percentage of samples > 5 NTU	0.00	0.00	0.00	0.00

The Canadian Drinking Water Guidelines and the US Environmental Protection Agency, state that the turbidity of an unfiltered treated water supply should generally be around 1 NTU, and should not exceed 5 NTU. As can be seen from the above summary table, treated water turbidity from Harvey during 2013 was generally acceptable for unfiltered treated water, with an average of 0.33 NTU for PRV-3, 0.31 NTU for Café, 0.24 NTU for Lions Bay Avenue, and 0.24 NTU for Kelvin Grove.

Magnesia Turbidity

	MAGNESIA 2013	
	PRV-5	**B. B.**
Count	254	254
Maximum Result (NTU)	2.63	4.62
Minimum Result (NTU)	0.13	0.11
Average (NTU)	0.33	0.35
Number of samples < 1 NTU	244	246
Number of samples > 1 NTU but < 5 NTU	10	8
Number of samples > 5 NTU	0	0
Percentage of samples < 1 NTU	96.06	96.85
Percentage of samples > 1 NTU but < 5 NTU	3.94	3.15
Percentage of samples > 5 NTU	0.00	0.00

The Canadian Drinking Water Guidelines and the US Environmental Protection Agency, state that the turbidity of an unfiltered treated water supply should generally be around 1 NTU, and should not exceed 5 NTU. As can be seen from the above summary table, treated water turbidity from Magnesia during 2013 was generally acceptable for unfiltered treated water, with an average of 0.33 NTU for PRV-5 and 0.35 for Brunswick Beach.

Harvey Chlorine Residual

	HARVEY 2013			
	PRV-3	**CAFE**	**LB AVENUE**	**KELVIN G.**
Count	254	254	254	254
Maximum Result (ppm)	1.12	1.08	0.92	1.09
Minimum Result (ppm)	0.23	0.02	0.01	0.05
Average (ppm)	0.85	0.70	0.69	0.60
No. of Samples Outside Limits	0	1	1	1
% Samples Outside Limits	0.00	0.39	0.39	0.39

The generally agreed Minimum Acceptable Residual Chlorine level in treated drinking water is 0.2 ppm, as recommended by Vancouver Coastal Health. The generally agreed Maximum Acceptable Residual Chlorine level in treated drinking water is 4.0 ppm as recommended by the US Environmental Protection Agency.

As can be seen from the above summary table, treated water Chlorine residual from Harvey during 2013 was generally acceptable, with an average of 0.85 ppm for PRV-3, 0.70 ppm for the Café, 0.69 for Lions Bay Avenue, and 0.60 ppm for Kelvin Grove.

Magnesia Chlorine Residual

	MAGNESIA 2013	
	PRV-5	**B. B.**
Count	254	254
Maximum Result (ppm)	1.22	0.96
Minimum Result (ppm)	0.05	0.01
Average (ppm)	0.85	0.55
No. of Samples Outside Limits	1	2
% Samples Outside Limits	0.39	0.79

The generally agreed Minimum Acceptable Residual Chlorine level in treated drinking water is 0.2 ppm, as recommended by Vancouver Coastal Health. The generally agreed Maximum Acceptable Residual Chlorine level in treated drinking water is 4.0 ppm as recommended by the US Environmental Protection Agency. As can be seen from the above summary table, treated water Chlorine residual from Magnesia during 2013 was generally acceptable, with an average of 0.85 ppm for PRV-5, and 0.55 ppm for Brunswick Beach.

Fecal and Total Coliforms

Harvey

	PRV-3	**STORE/CAFE**	**LB AVENUE**	**KELVIN G.**
Count	52	52	52	52
No. Negative Results	52	52	52	51
No. Positive Results	0	0	0	1
% Positive Results	0%	0%	0%	1.9%

Magnesia

	PRV-5	**BRUNSWICK B.**
Count	52	52
No. Negative Results	52	52
No. Positive Results	0	0
% Positive Results	0%	0%

In the Total and Fecal Coliform tests, the result is either Positive (P) or Negative (N), where a Positive result is not acceptable as it indicates the presence of coliforms. There was one Positive result in Kelvin Grove during 2013 (see information below).

The BC Water Protection Regulation establishes the following Water Quality Standards:

- Fecal Coliforms: <1cfu/100ml
- E. Coli: <1cfu/100ml
- Total Coliforms for 1 sample in 30 days: <1cfu/100ml
- Total Coliforms for more than 1 sample in 30 days: 90% of samples must be <1cfu/100ml and no sample >10cfu/100ml

"Immediate Reporting Standard": If the fecal Coliform or E. Coli parameter fails to meet the water quality standard results must be immediately reported to:

- The Manager of Public Works
- The Drinking Water Officer
- The Medical Health Officer

The Canadian Drinking Water Quality Guidelines establishes

- Maximum Acceptable Concentration (MAC) for Coliforms = 0 cfu/100ml
- A single sample may contain up to 10 cfu/100ml Total Coliforms, but no samples should contain Fecal Coliform

Note: 1cfu/100ml = 1 MPN/100ml

On August 19, 2013 the Village received from The ALS Laboratory a positive result with Total Coliform = 15 MPN/100ml for the Kelvin Grove sample station, and according to the Canadian Drinking Water Quality Guidelines, this result was not within the acceptable limits. On August 21, 2013 another sample from the Kelvin Grove station was sent to the ALS laboratory and the result was Negative. The Vancouver Coastal Health Officer was informed about this situation.

Metals and General Chemistry
See results in Appendix "C"

UPGRADING WORK IN 2013
There were not upgrading works during 2013.

UPGRADING WORK PLANNED FOR 2014
Works to be performed in Highview Place:

- Replace Water Main with Ductile Iron Pipe
- Install new Isolation Valves
- Install new Fire Hydrants
- Install new Service Connections.

OPERATOR TRAINING

The Village's Water Treatment/Distribution System has been evaluated as Water System "Class II" by the Environmental Operators Certification Program (EOCP). The Operator for the Village's Water System is Alberto Urrutia, and he has completed the following courses:

Description	Year
❖ Truck Mounted Manlift	2013
❖ Shoring and Excavation Training	2013
❖ Fall Protection	2013
❖ Preventing Waterborne Illnesses	2013
❖ Supervisory and Leadership Skills	2013
❖ UV Disinfection	2013
❖ Hydrant Maintenance Program	2012
❖ Water Quality Sampling for Water & Wastewater	2012
❖ Municipal Confined Space Entry	2011
❖ Water Distribution II	2011
❖ Truck Mounted Manlift	2010
❖ Water Distribution I	2010
❖ Trojan UV Swift Reactors	2010
❖ Instrumentation 1	2008
❖ Electrical Principles Level 1	2007
❖ Hydrant Maintenance and Testing	2007
❖ Water Sources	2007
❖ Water Treatment 2	2006
❖ Confined Space Workshop	2005
❖ Water Treatment I	2005
❖ Chlorine Handling	2005
❖ Utility Management	2004
❖ Water Treatment Plant Operation II	2004
❖ Water Treatment Plant Operation I	2004
❖ Water Distribution System Operation and Maintenance	2004
❖ Small Water System Operation and Maintenance	2004
❖ Small Water Systems	2003
❖ Waterworks Technology.	2002

EOCP Certificates obtained by Alberto Urrutia:

Description	Year
❖ Water Distribution Level 2	2006
❖ Chlorine Handler	2005
❖ Water Distribution Level 1	2005
❖ Water Distribution Operator-In-Training.	2004

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Appendix A

Water Quality Sampling

LIST OF SAMPLING SITE LOCATIONS

Location	Source	Tests	Frequency
PRV-3	Harvey Creek	CL2 Residual and Turbidity	Daily Monday-Friday
400,000 Gal Harvey Tank	Harvey Creek	CL2 Residual and Turbidity	Daily Monday-Friday
General Store/Cafe	Harvey Creek	CL2 Residual and Turbidity	Daily Monday-Friday
Lions Bay Avenue	Harvey Creek	CL2 Residual and Turbidity	Daily Monday-Friday
Kelvin Grove	Harvey Creek	CL2 Residual and Turbidity	Daily Monday-Friday
PRV-5	Magnesia Creek	CL2 Residual and Turbidity	Daily Monday-Friday
100,000 Gal Magnesia Tank	Magnesia Creek	CL2 Residual and Turbidity	Daily Monday-Friday
Brunswick Beach	Magnesia Creek	CL2 Residual and Turbidity	Daily Monday-Friday
Harvey Intake	Harvey Creek	Raw Water Turbidity	Daily Monday-Friday
Magnesia Intake	Magnesia Creek	Raw Water Turbidity	Daily Monday-Friday
PRV-3	Harvey Creek	Total/Fecal Coliform, E Coli	Every Monday
400,000 Gal Harvey Tank	Harvey Creek	Total/Fecal Coliform, E Coli	Every Monday
Harvey UV Reactor	Harvey Creek	Total/Fecal Coliform, E Coli	Once a Month
General Store/Cafe	Harvey Creek	Total/Fecal Coliform, E Coli	Every Monday
Lions Bay Avenue	Harvey Creek	Total/Fecal Coliform, E Coli	Every Monday
Kelvin Grove	Harvey Creek	Total/Fecal Coliform, E Coli	Every Monday
PRV-5	Magnesia Creek	Total/Fecal Coliform, E Coli	Every Monday
100,000 Gal Magnesia Tank	Magnesia Creek	Total/Fecal Coliform, E Coli	Every Monday
Magnesia UV Reactor	Magnesia Creek	Total/Fecal Coliform, E Coli	Once a Month
Brunswick Beach	Magnesia Creek	Total/Fecal Coliform, E Coli	Every Monday
PRV-3	At Tap	Metals, THM's, Organics	Twice a year
400,000 Gal Harvey Tank	At Tap	Metals, THM's, Organics	Twice a year
General Store/Cafe	At Tap	Metals, THM's, Organics	Twice a year
Lions Bay Avenue	At Tap	Metals, THM's, Organics	Twice a year
Kelvin Grove	At Tap	Metals, THM's, Organics	Twice a year
Community Centre	At Tap	Metals, THM's, Organics	Twice a year
PRV-5	At Tap	Metals, THM's, Organics	Twice a year
100,000 Gal Magnesia Tank	At Tap	Metals, THM's, Organics	Twice a year
Brunswick Beach	At Tap	Metals, THM's, Organics	Twice a year
Elementary School	At Tap	Metals, THM's, Organics	Twice a year
Harvey Intake	Harvey Creek	Metals, Organics	Twice a year
Magnesia Intake	Magnesia Creek	Metals, Organics	Twice a year

Bacteria

Sample collection for monitoring bacteria levels (Total Coliforms, Fecal and E. Coli) in the Lions Bay Water Distribution System is performed every Monday at eight sites. Samples are delivered to the Laboratory for analysis and reporting. The sampling locations are listed above and include source, middle, and end systems sites.

In addition, random samples may be taken from areas where water quality complaints have originated or where waterworks construction or maintenance activities are underway.

Bacteriological standards in water distribution systems should meet the requirements of the B.C. Safe Drinking Water Regulations, which stipulates the following criteria for sample test results:

- Total Coliform: 10 or less total coliform / 100 ml
- Total Coliform: 90% or more of the samples for a given month must have 0 total coliform / 100 ml.

Physical Parameters

Treated Water in the Distribution System is tested for Turbidity daily from Monday to Friday, at eight sites. Raw Water is tested for Turbidity at both intakes daily from Monday to Friday. Taste, Odour, and Turbidity are monitored on a complaint basis.

The Canadian Drinking Water Guidelines (and the US Environmental Protection Agency) state that the turbidity of an unfiltered raw water supply should generally be around 1 NTU, and should not exceed 5 NTU.

Chemical Parameters

- Free Chlorine Residual: Measured at all sampling sites when bacteriological samples are collected

- Haloacetic Acids (HAA's): HAA's are disinfection by-products. HAA's are not regulated in Canada but a maximum contaminant level of 60 ppb (based on a running annual average calculated with quarterly results for different locations within the system) has recently been adopted in the USA

- Trihalomethanes (THM's): THM's are disinfection by-products sampled with HAA's. The Guidelines for Canadian Drinking Water Quality (GCDWQ) list an interim maximum acceptable concentration for THM's at 100 ppb (based on a running annual average calculated with quarterly results for different locations within the system)

- pH: Measured on samples collected for THM's testing. The GCDWQ recommend an aesthetic objective for pH ranging between 6.5 and 8.5

- Metals: The Regional Medical Health Officers developed a strategy for sampling metals at the tap. The new requirement is to sampling metals "at the tap" in a biyearly basis for lead, copper and zinc, with sample locations consisting of a mixture of private homes, sample stations, and public buildings, including schools.

TREATED WATER JANUARY 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.37	1.12	0.20	1.10	0.31	0.93	0.15	0.83	0.21	0.89	0.41	0.90	0.28	0.91	0.73	0.65
2	0.60	1.04	0.32	1.03	0.28	0.85	0.20	0.92	0.15	0.75	0.30	0.86	0.19	0.83	0.41	0.78
3	0.29	1.02	0.46	1.00	0.42	0.92	0.22	0.87	0.40	0.75	0.35	0.91	0.27	0.83	0.29	0.70
4	0.33	0.95	0.72	0.93	0.39	0.80	0.29	0.85	0.28	0.71	0.66	0.82	0.39	0.79	0.25	0.64
5																
6																
7	0.43	0.61	0.57	0.59	0.49	0.49	0.18	0.51	0.43	0.38	0.17	0.73	0.63	0.69	0.37	0.50
8	0.29	0.65	0.32	0.62	0.18	0.48	0.16	0.44	0.36	0.25	0.40	0.98	0.54	0.95	0.33	0.45
9	0.43	0.68	0.51	0.66	0.27	0.51	0.24	0.41	0.33	0.30	0.47	0.95	0.35	0.92	0.23	0.48
10	0.27	0.75	0.36	0.72	0.62	0.54	0.18	0.44	0.23	0.31	0.32	0.96	0.38	0.98	0.25	0.67
11	0.34	0.98	0.26	0.96	0.40	0.65	0.24	0.51	0.29	0.59	0.35	1.06	0.17	1.07	0.36	0.59
12																
13																
14	0.34	1.10	0.20	1.08	0.27	0.93	0.14	0.84	0.12	0.89	0.23	1.15	0.16	1.09	0.16	0.78
15	0.33	1.07	0.21	1.05	0.19	0.92	0.15	0.92	0.15	0.79	0.36	0.88	0.19	0.87	0.19	0.86
16	0.41	1.08	0.44	1.06	0.27	0.92	0.15	0.90	0.33	0.78	0.21	0.83	0.17	0.78	0.22	0.89
17	0.40	0.95	0.25	0.92	0.28	0.80	0.13	0.89	0.23	0.81	0.26	0.90	0.29	0.93	0.22	0.69
18	0.33	0.91	0.50	0.88	0.29	0.77	0.20	0.79	0.29	0.71	0.17	0.85	0.20	0.82	0.23	0.60
19																
20																
21	0.22	0.96	0.32	0.94	0.22	0.71	0.16	0.72	0.27	0.59	0.17	0.80	0.32	0.77	0.30	0.64
22	0.28	0.75	0.53	0.73	0.23	0.64	0.24	0.70	0.20	0.63	0.16	1.03	0.15	1.00	0.27	0.59
23	0.62	0.75	0.72	0.72	0.30	0.62	0.27	0.59	0.17	0.51	0.87	1.04	0.25	1.03	0.24	0.66
24	0.33	0.58	0.45	0.55	0.30	0.50	0.33	0.57	0.23	0.43	0.34	0.99	0.40	0.95	0.39	0.79
25	0.36	0.75	0.59	0.72	0.32	0.50	0.22	0.42	0.22	0.30	0.20	0.97	0.36	0.98	0.20	0.84
26																
27																
28	0.23	0.87	0.25	0.85	0.26	0.66	0.16	0.60	0.13	0.60	0.37	1.00	0.16	0.98	0.24	0.69
29	0.20	0.89	0.20	0.86	0.18	0.72	0.18	0.67	0.16	0.54	0.37	0.85	0.31	0.79	0.21	0.68
30	0.36	1.00	0.61	0.98	0.26	0.77	0.24	0.75	0.19	0.75	0.20	0.78	0.23	0.75	0.22	0.70
31	0.20	0.96	0.76	0.94	0.34	0.80	0.27	0.78	0.20	0.66	0.52	0.79	0.27	0.76	0.25	0.56

TREATED WATER FEBRUARY 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.29	0.87	0.30	0.85	0.15	0.74	0.22	0.76	0.34	0.61	0.20	0.79	0.26	0.72	0.18	0.51
2																
3																
4	0.18	0.92	0.35	0.89	0.30	0.73	0.18	0.69	0.16	0.79	0.48	0.79	0.36	0.79	0.35	0.48
5	0.40	0.93	0.39	0.91	0.27	0.75	0.20	0.71	0.25	0.63	0.19	0.93	0.29	0.92	0.36	0.54
6	0.24	0.81	0.23	0.79	0.18	0.66	0.23	0.71	0.15	0.57	0.54	0.97	0.16	0.95	0.26	0.55
7	0.33	0.77	0.25	0.74	0.30	0.60	0.21	0.64	0.16	0.48	0.44	0.86	0.45	0.82	0.21	0.67
8	0.45	0.68	0.32	0.65	0.30	0.48	0.20	0.50	0.19	0.36	0.32	0.93	0.25	0.89	0.28	0.63
9																
10																
11	0.17	1.15	0.18	1.12	0.22	0.84	0.15	0.78	0.18	0.80	0.21	1.02	0.34	0.99	0.20	0.63
12	0.33	1.03	0.38	1.01	0.63	0.89	0.17	0.87	0.18	0.82	0.20	0.80	0.30	0.81	0.38	0.72
13	0.44	1.03	0.27	1.00	0.58	0.88	0.29	0.77	0.13	0.79	0.24	0.89	0.29	0.76	0.25	0.74
14	0.27	1.01	0.23	0.98	0.14	0.87	0.14	0.87	0.25	0.89	0.18	0.75	0.19	0.75	0.20	0.58
15	0.38	1.06	0.16	1.03	0.17	0.85	0.17	0.86	0.15	0.88	0.23	0.77	0.44	0.75	0.20	0.53
16																
17																
18	0.21	0.92	0.28	0.90	0.20	0.76	0.18	0.74	0.19	0.67	0.14	0.84	0.22	0.84	0.21	0.55
19	0.27	0.93	0.25	0.91	0.36	0.76	0.16	0.72	0.71	0.60	0.37	1.08	0.40	1.02	0.23	0.58
20	0.19	0.98	0.41	0.96	0.30	0.77	0.18	0.74	0.21	0.62	0.15	1.02	0.19	1.00	0.33	0.60
21	0.24	1.01	0.22	0.98	0.17	0.88	0.21	0.79	0.16	0.70	0.37	1.03	0.29	1.02	0.23	0.77
22	0.64	0.95	0.46	0.93	0.23	0.85	0.27	0.82	0.26	0.93	0.36	1.00	0.24	0.94	0.25	0.73
23																
24																
25	0.20	0.86	0.24	0.84	0.18	0.78	0.18	0.68	0.16	0.49	0.24	1.12	0.31	1.12	0.18	0.71
26	0.38	0.88	0.25	0.87	0.20	0.66	0.23	0.68	0.13	0.57	0.15	0.81	0.30	0.84	0.26	0.79
27	0.38	0.98	0.35	0.96	0.29	0.76	0.25	0.62	0.14	0.53	0.21	0.79	0.23	0.80	0.22	0.85
28	0.19	0.99	0.44	0.98	0.16	0.81	0.24	0.73	0.22	0.59	0.21	0.81	0.31	0.78	0.20	0.66

TREATED WATER MARCH 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.64	0.99	0.48	0.97	0.23	0.87	0.26	0.80	0.18	0.74	0.54	0.66	0.40	0.65	0.27	0.55
2																
3																
4	0.49	0.89	0.60	0.86	0.26	0.64	0.33	0.58	0.37	0.51	0.32	0.94	0.27	0.92	0.25	0.67
5	0.45	0.90	0.31	0.88	0.46	0.73	0.22	0.65	0.20	0.53	0.26	1.12	0.24	1.14	0.26	0.59
6	0.45	0.95	0.37	0.92	0.26	0.76	0.31	0.67	0.23	0.76	0.22	1.09	0.28	1.05	0.19	0.61
7	0.39	0.91	0.77	0.89	0.40	0.74	0.34	0.70	0.21	0.69	0.66	0.94	0.71	0.96	0.26	0.80
8	0.23	0.91	0.38	0.89	0.29	0.73	0.28	0.72	0.23	0.67	0.45	0.95	0.33	0.88	0.34	0.82
9																
10																
11	0.14	0.96	0.20	0.94	0.20	0.80	0.34	0.71	0.31	0.70	0.22	1.10	0.20	0.93	0.22	0.67
12	0.26	0.93	0.44	0.91	0.25	0.78	0.24	0.77	0.22	0.72	0.33	0.93	0.32	0.88	0.19	0.78
13	0.76	0.66	0.78	0.63	0.29	0.53	0.21	0.73	0.25	0.56	0.69	0.70	0.42	0.68	0.24	0.86
14	0.53	0.67	0.83	0.63	0.55	0.41	0.27	0.40	0.34	0.39	0.50	0.56	0.63	0.61	0.44	0.68
15	0.78	0.85	0.89	0.83	0.67	0.50	0.52	0.34	0.46	0.25	0.72	0.69	0.66	0.61	0.37	0.37
16																
17																
18	0.58	1.00	0.24	0.97	0.57	0.74	0.33	0.69	0.30	0.45	0.33	1.25	0.32	1.18	0.31	0.34
19	0.56	1.00	0.91	0.97	0.31	0.78	0.25	0.72	0.19	0.70	0.24	1.18	0.28	1.13	0.20	0.79
20	0.28	0.95	0.37	0.93	0.32	0.83	0.19	0.80	0.22	0.67	0.42	1.00	0.31	0.99	0.35	0.81
21	0.40	0.68	0.45	0.66	0.32	0.56	0.23	0.74	0.23	0.53	0.28	0.87	0.24	0.84	0.44	0.88
22	0.34	0.85	1.27	0.82	0.52	0.67	0.41	0.54	0.18	0.64	0.26	0.99	0.35	0.96	0.22	0.62
23																
24																
25	0.23	1.08	2.05	1.06	0.38	0.93	0.28	0.84	0.35	0.97	0.20	1.00	0.25	0.94	0.21	0.72
26	0.26	1.02	0.28	0.99	0.24	0.85	0.24	0.87	0.30	0.95	0.24	0.79	0.29	0.75	0.20	0.73
27	0.37	1.01	0.44	0.99	0.19	0.86	0.23	0.88	0.22	0.81	0.28	0.85	0.20	0.82	0.24	0.70
28	0.29	0.94	0.35	0.92	0.36	0.81	0.20	0.81	0.26	0.72	0.24	0.83	0.22	0.78	0.22	0.56
29	0.19	0.90	0.28	0.87	0.19	0.73	0.30	0.82	0.14	0.80	0.45	0.86	0.21	0.84	0.23	0.56
30																
31																

TREATED WATER APRIL 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.26	0.61	0.16	0.70	0.24	0.56	0.15	0.57	0.19	0.44	0.31	0.75	0.29	0.73	0.20	0.50
2	0.32	0.74	0.50	0.71	0.29	0.60	0.26	0.54	0.22	0.55	0.28	0.81	0.20	0.69	0.20	0.49
3	0.29	0.68	0.27	0.65	0.27	0.47	0.29	0.53	0.21	0.44	0.28	0.90	0.32	0.88	0.22	0.43
4	0.58	0.78	0.41	0.75	0.25	0.61	0.24	0.54	0.22	0.56	0.23	0.99	0.29	0.94	0.27	0.36
5	0.53	0.77	0.48	0.74	0.34	0.59	0.19	0.55	0.17	0.44	0.97	0.73	0.77	0.72	0.25	0.46
6																
7																
8	0.31	0.84	0.40	0.82	0.32	0.66	0.31	0.47	0.26	0.60	0.32	0.84	0.37	0.81	0.44	0.31
9	0.42	0.89	0.45	0.87	0.51	0.73	0.31	0.59	0.21	0.57	0.47	0.77	0.35	0.73	0.35	0.39
10	0.35	0.91	0.42	0.89	0.26	0.78	0.31	0.69	0.25	0.81	0.21	0.77	0.32	0.75	0.28	0.46
11	0.34	0.74	0.40	0.71	0.39	0.64	0.37	0.66	0.27	0.53	0.41	0.77	0.34	0.72	0.51	0.39
12	0.44	0.80	0.41	0.78	0.22	0.63	0.24	0.54	0.27	0.45	0.50	0.86	0.26	0.85	0.28	0.46
13																
14																
15	0.19	0.96	0.21	1.00	0.24	0.76	0.17	0.73	0.19	0.54	0.21	0.97	0.20	0.93	0.22	0.54
16	0.29	1.00	0.39	0.97	0.29	0.79	0.28	0.76	0.16	0.83	0.22	1.04	0.32	0.90	0.40	0.61
17	0.35	0.90	0.77	0.88	0.20	0.79	0.23	0.76	1.32	0.90	0.27	1.09	0.21	1.06	0.30	0.63
18	0.19	0.81	0.35	0.79	0.24	0.71	0.21	0.70	0.30	0.74	0.19	0.98	0.19	0.96	0.25	0.67
19	0.32	0.75	0.28	0.73	0.20	0.64	0.22	0.66	0.27	0.67	0.29	0.98	0.30	0.92	0.20	0.76
20																
21																
22	0.29	0.72	0.37	0.68	0.19	0.47	0.21	0.44	0.23	0.56	0.34	0.98	0.22	0.92	0.23	0.57
23	0.39	0.81	0.31	0.78	0.31	0.58	0.17	0.50	0.15	0.73	0.48	1.01	0.28	0.90	0.23	0.59
24	0.25	0.89	0.22	0.87	0.19	0.68	0.22	0.60	0.18	0.75	0.24	1.01	0.22	0.94	0.20	0.60
25	0.29	0.87	0.20	0.86	0.57	0.67	0.24	0.68	0.19	0.73	0.25	0.78	0.27	0.79	0.21	0.66
26	0.53	0.80	0.23	0.78	0.21	0.69	0.25	0.63	0.16	0.72	0.39	0.75	0.24	0.73	0.18	0.67
27																
28																
29	0.22	0.89	0.38	0.87	0.24	0.64	0.20	0.58	0.15	0.60	0.20	0.83	0.25	0.75	0.22	0.34
30	0.19	0.91	0.34	0.89	0.31	0.66	0.21	0.64	0.17	0.71	0.17	0.98	0.30	0.91	0.24	0.41

TREATED WATER MAY 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.18	0.90	0.29	0.87	0.25	0.73	0.22	0.69	0.18	0.56	0.21	0.95	0.25	0.95	0.18	0.43
2	0.22	0.92	0.27	0.91	0.42	0.80	0.20	0.74	0.20	0.80	0.28	0.96	0.19	0.92	0.18	0.67
3	0.23	0.85	0.37	0.83	0.23	0.70	0.28	0.74	0.19	0.81	0.23	0.96	0.21	0.91	0.21	0.71
4																
5																
6	0.35	0.75	0.60	0.73	0.25	0.57	0.34	0.60	0.53	0.68	0.41	0.79	0.42	0.73	0.21	0.61
7	0.30	0.71	0.39	0.68	0.36	0.51	0.31	0.53	0.25	0.55	0.39	0.56	0.40	0.49	0.31	0.44
8	0.42	0.82	0.35	0.80	0.34	0.79	0.28	0.56	0.32	0.63	0.38	0.76	0.32	0.73	0.41	0.22
9	0.29	0.90	0.28	0.88	0.40	0.66	0.25	0.70	0.26	0.60	0.42	0.89	0.32	0.85	0.27	0.31
10	0.42	0.91	0.51	0.88	0.31	0.70	0.26	0.73	0.26	0.68	0.36	0.92	0.35	0.88	0.28	0.46
11																
12																
13	0.40	0.74	0.55	0.85	0.24	0.67	0.29	0.72	0.27	0.66	0.47	0.82	1.08	0.78	0.27	0.46
14	0.29	0.72	0.36	0.74	0.34	0.55	0.47	0.55	0.38	0.42	0.38	0.95	0.39	0.81	0.39	0.27
15	0.30	0.86	0.34	0.84	0.26	0.60	0.32	0.64	0.26	0.35	0.35	0.99	0.38	0.91	0.41	0.21
16	0.28	0.86	0.24	0.82	0.21	0.61	0.24	0.64	0.22	0.41	0.35	0.97	0.30	0.94	0.28	0.30
17	0.22	0.95	0.31	0.93	0.28	0.73	0.35	0.74	0.25	0.72	0.26	1.03	0.22	1.00	0.24	0.55
18																
19																
20	0.28	0.98	0.20	0.95	0.26	0.77	0.29	0.72	0.19	0.69	0.23	0.91	0.26	0.95	0.20	0.62
21	0.32	1.04	0.29	1.01	0.23	0.87	0.35	0.83	0.17	0.72	0.31	1.13	0.31	1.11	0.23	0.56
22	0.26	0.91	0.31	0.88	0.20	0.74	0.28	0.77	0.22	0.90	0.28	0.90	0.72	0.88	0.24	0.62
23	0.21	0.90	0.28	0.88	0.20	0.70	0.29	0.71	0.16	0.61	0.36	0.87	0.27	0.84	0.21	0.68
24	0.25	0.83	0.25	0.80	0.24	0.64	0.21	0.65	0.19	0.50	0.26	0.83	0.26	0.85	0.26	0.65
25																
26																
27	0.33	0.84	0.22	0.82	0.20	0.69	0.20	0.69	0.16	0.54	0.23	0.88	0.26	0.83	0.18	0.48
28	0.42	0.63	0.41	0.64	0.33	0.60	0.22	0.65	0.21	0.56	0.52	0.84	0.41	0.82	0.35	0.57
29	0.84	0.68	0.44	0.66	0.50	0.56	0.34	0.42	0.60	0.36	0.74	0.86	0.49	0.83	0.19	0.51
30	0.30	0.80	0.45	0.77	0.36	0.59	0.30	0.30	0.27	0.21	0.41	0.92	0.56	0.86	0.38	0.33
31	0.32	1.00	0.53	0.99	0.32	0.77	0.23	0.63	0.23	0.60	0.40	0.99	0.39	0.92	0.31	0.33

TREATED WATER JUNE 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1																
2																
3	0.33	0.97	0.28	0.96	0.64	0.81	0.18	0.79	0.69	0.95	0.42	0.96	0.45	0.98	0.21	0.54
4	0.35	0.94	0.51	0.92	0.39	0.85	0.29	0.78	0.28	0.54	0.30	0.75	0.25	0.73	0.21	0.65
5	0.26	0.87	0.25	0.84	0.20	0.71	0.22	0.75	0.18	0.50	0.28	0.85	0.21	0.80	0.17	0.50
6	0.38	0.91	0.32	0.89	0.35	0.75	0.20	0.72	0.21	0.59	0.47	0.83	0.28	0.83	0.36	0.45
7	0.37	0.94	0.20	0.93	0.21	0.69	0.21	0.75	0.20	0.65	0.25	0.87	0.27	0.83	0.18	0.48
8																
9																
10	0.25	1.09	0.25	1.07	0.16	0.87	0.24	0.87	0.14	0.72	0.35	1.04	0.23	0.96	0.15	0.55
11	0.44	0.98	0.17	0.96	0.29	0.80	0.23	0.85	0.13	0.77	0.24	1.00	0.24	0.97	0.27	0.54
12	0.23	0.91	0.27	0.88	0.20	0.71	0.22	0.77	0.20	0.54	0.18	0.95	0.25	0.95	0.18	0.56
13	0.25	0.86	0.27	0.85	0.21	0.72	0.17	0.70	0.17	0.66	0.23	0.96	0.20	0.95	0.19	0.61
14	0.26	0.89	0.17	0.88	0.30	0.66	0.25	0.68	0.16	0.62	0.20	0.94	0.19	0.97	0.22	0.60
15																
16																
17	0.22	0.83	0.23	0.81	0.24	0.64	0.21	0.70	0.21	0.51	0.22	0.90	0.38	0.86	0.23	0.60
18	0.27	0.90	0.34	0.89	0.27	0.86	0.20	0.66	0.17	0.48	0.37	0.71	0.30	0.72	0.19	0.54
19	0.32	0.87	0.24	0.85	0.25	0.70	0.21	0.67	0.19	0.54	0.22	0.75	0.17	0.70	0.18	0.44
20	0.22	0.88	0.26	0.87	0.34	0.72	0.21	0.69	0.18	0.57	0.34	0.74	0.27	0.69	0.22	0.28
21	0.30	0.84	0.28	0.82	0.24	0.66	0.40	0.67	0.28	0.46	0.36	0.61	0.58	0.60	0.21	0.26
22																
23																
24	0.24	0.78	0.40	0.90	0.19	0.74	0.22	0.26	0.13	0.53	0.26	0.88	0.37	0.90	0.13	0.28
25	0.53	0.55	0.29	0.62	0.28	0.45	0.32	0.50	0.23	0.36	0.50	0.85	0.52	0.77	0.15	0.46
26	0.31	0.55	0.25	0.60	0.22	0.38	0.19	0.37	0.18	0.22	0.39	1.17	0.33	1.11	0.31	0.50
27	0.31	0.47	0.36	0.46	0.22	0.35	0.22	0.32	0.17	0.21	0.37	0.86	0.36	0.81	0.33	0.19
28	0.19	0.59	0.30	0.71	0.20	0.41	0.25	0.37	0.20	0.33	0.29	0.99	0.30	0.88	0.25	0.21
29																
30																

TREATED WATER JULY 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.30	0.88	0.32	0.84	0.29	0.69	0.27	0.58	0.32	0.63	0.34	0.89	0.33	0.82	0.16	0.40
2	0.34	0.91	0.29	0.88	3.45	0.78	0.48	0.74	0.20	0.64	0.24	0.80	0.22	0.75	0.18	0.45
3	0.22	0.95	0.24	0.93	0.20	0.74	0.26	0.78	0.19	0.66	0.31	0.96	0.43	0.93	0.17	0.62
4	0.17	0.91	0.39	0.88	0.24	0.77	0.51	0.82	0.36	0.69	0.20	0.93	0.25	0.83	0.16	0.55
5	0.18	0.97	0.25	0.94	0.20	0.84	0.37	0.83	0.18	0.57	0.25	1.01	0.19	0.98	0.19	0.49
6																
7																
8	0.19	1.02	0.16	0.98	0.23	0.82	0.24	0.82	0.15	0.63	1.03	0.97	0.95	1.03	0.17	0.65
9	0.17	0.93	0.36	0.91	0.46	0.80	0.21	0.78	0.17	0.58	0.42	0.72	0.29	0.71	0.22	0.70
10	0.15	0.83	0.15	0.82	0.17	0.68	0.30	0.75	0.20	0.66	0.89	0.74	0.23	0.71	0.17	0.44
11	0.15	0.85	0.19	0.84	0.17	0.63	0.39	0.68	0.13	0.52	0.18	0.81	0.19	0.76	0.16	0.47
12	0.18	0.87	0.23	0.84	0.17	0.68	0.96	0.72	0.15	0.51	0.16	0.85	0.20	0.80	0.15	0.43
13																
14																
15	0.15	0.88	0.15	0.87	0.18	0.77	0.24	0.71	0.14	0.88	0.22	0.87	0.15	0.88	0.19	0.61
16	0.21	0.89	0.16	0.86	2.55	0.64	0.21	0.79	0.17	0.56	0.27	0.99	0.16	0.96	0.14	0.69
17	0.14	0.90	0.23	0.87	0.20	0.73	0.30	0.78	0.20	0.61	0.22	0.97	0.21	0.93	0.13	0.80
18	0.16	0.78	0.17	0.75	0.17	0.66	0.39	0.72	0.18	0.56	0.14	0.86	0.16	0.85	0.14	0.69
19	0.24	0.73	0.18	0.70	0.21	0.62	0.15	0.70	0.18	0.44	0.15	0.87	0.27	0.83	0.19	0.56
20																
21																
22	0.15	0.84	0.18	0.81	0.31	0.67	0.19	0.79	0.14	0.61	0.19	0.84	0.23	0.81	0.15	0.61
23	0.14	0.88	0.19	0.85	0.20	0.68	0.17	0.74	0.15	0.54	0.25	0.69	0.17	0.70	0.16	0.58
24	0.13	0.90	0.20	0.87	0.13	0.71	0.19	0.79	0.17	0.52	0.27	0.82	0.18	0.78	0.11	0.44
25	0.22	0.88	0.17	0.85	0.12	0.69	0.16	0.79	0.18	0.70	0.24	0.85	0.18	0.82	0.14	0.57
26	0.20	0.92	0.18	0.89	0.12	0.70	0.17	0.79	0.15	0.57	0.16	0.88	0.18	0.87	0.16	0.58
27																
28																
29	0.17	0.91	0.15	0.88	1.88	0.74	0.17	0.84	0.18	0.49	0.20	0.88	0.22	0.84	0.19	0.61
30	0.16	0.93	0.17	0.90	0.18	0.76	0.14	0.81	0.22	0.61	0.31	0.98	0.17	0.93	0.24	0.59
31	0.27	0.84	0.17	0.81	0.21	0.67	0.13	0.72	0.22	0.57	0.15	0.95	0.19	0.92	0.15	0.76

TREATED WATER AUGUST 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.13	0.75	0.19	0.74	0.11	0.63	0.13	0.67	0.20	0.58	0.15	0.91	0.13	0.89	0.17	0.62
2	0.30	0.70	0.16	0.67	0.14	0.57	0.15	0.64	0.23	0.56	0.17	0.77	0.16	0.75	0.17	0.57
3																
4																
5																
6	0.22	0.88	0.18	0.85	0.15	0.77	0.18	0.79	0.17	0.62	1.44	0.77	0.33	0.82	0.18	0.65
7	0.17	0.90	0.16	0.87	0.15	0.67	0.13	0.78	0.27	0.54	2.70	0.80	0.22	0.86	0.24	0.60
8	0.19	0.90	0.17	0.88	0.13	0.76	0.20	0.85	0.25	0.64	0.69	0.86	2.63	0.79	1.12	0.26
9	0.35	0.92	0.22	0.89	0.17	0.79	0.17	0.85	0.15	0.58	0.35	0.92	0.73	0.85	0.35	0.57
10																
11																
12	0.24	0.91	0.20	0.89	0.16	0.69	0.12	0.83	0.12	0.64	0.20	0.89	0.19	0.82	0.18	0.56
13	0.20	0.92	0.15	0.90	0.15	0.72	0.40	0.84	0.16	0.71	0.14	1.00	0.21	0.91	0.49	0.55
14	0.20	0.87	0.15	0.84	0.22	0.70	0.14	0.80	0.17	0.54	0.15	0.97	0.16	0.95	0.31	0.72
15	0.18	0.79	0.25	0.76	0.13	0.65	0.17	0.76	0.16	0.49	0.17	0.89	0.20	0.91	0.18	0.61
16	0.16	0.85	0.20	0.83	0.18	0.66	0.19	0.74	0.16	0.61	0.13	0.95	0.16	0.93	0.79	0.56
17																
18																
19	0.22	0.78	0.17	0.75	0.17	0.61	0.14	0.68	0.17	0.48	0.18	0.92	0.16	0.91	0.23	0.76
20	0.23	0.81	0.17	0.79	0.15	0.64	0.14	0.65	0.18	0.60	0.43	0.75	0.17	0.75	0.80	0.65
21	0.27	0.86	0.18	0.84	0.17	0.68	0.17	0.74	0.16	0.62	0.24	0.84	0.21	0.81	0.39	0.49
22	0.17	0.85	0.21	0.81	0.17	0.69	0.12	0.75	0.18	0.57	0.14	0.80	0.23	0.80	0.24	0.48
23	0.18	0.82	0.25	0.79	0.36	0.71	0.20	0.72	0.13	0.73	0.15	0.76	0.13	0.74	0.36	0.49
24																
25																
26	0.16	0.77	0.25	0.74	0.29	0.51	0.14	0.62	0.19	0.57	0.24	0.79	0.13	0.79	0.24	0.54
27	0.18	0.77	0.15	0.75	0.13	0.62	0.14	0.64	0.35	0.62	0.12	0.85	0.13	0.83	0.20	0.48
28	0.29	0.81	0.17	0.77	0.17	0.57	0.14	0.68	0.24	0.63	0.15	0.85	0.18	0.83	0.23	0.44
29	0.62	0.38	0.32	0.38	0.23	0.29	0.22	0.34	0.63	0.32	0.32	0.71	0.35	0.69	0.31	0.47
30	2.13	0.25	1.77	0.23	1.36	0.02	0.66	0.01	0.87	0.05	11.5	0.17	2.09	0.05	0.89	0.35
31																

TREATED WATER SEPTEMBER 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1																
2	9.40	1.06	1.15	1.02	0.83	0.69	0.53	0.66	0.71	0.43	1.02	0.69	1.12	0.56	3.94	0.01
3	0.85	0.94	0.32	0.91	0.23	0.70	0.26	0.72	0.29	0.70	0.53	0.73	0.78	0.64	0.72	0.51
4	0.40	0.82	0.26	0.80	0.19	0.63	0.25	0.66	0.27	0.46	0.38	0.77	0.42	0.65	0.52	0.24
5	0.27	0.91	0.17	0.88	0.21	0.65	0.23	0.67	0.20	0.49	0.33	0.75	0.30	0.72	0.55	0.43
6	0.21	0.91	0.24	0.89	0.21	0.67	0.18	0.62	0.24	0.45	0.32	0.75	0.41	0.69	0.32	0.26
7																
8																
9	0.24	0.92	0.22	0.89	0.20	0.72	0.15	0.70	0.15	0.51	0.24	0.88	0.37	0.79	0.25	0.29
10	0.20	0.95	0.16	0.93	0.16	0.77	0.18	0.71	0.18	0.56	0.25	0.86	0.21	0.81	0.21	0.40
11	0.17	0.95	0.17	0.93	0.19	0.81	0.17	0.78	0.20	0.48	0.89	0.47	0.31	0.92	0.32	0.46
12	0.20	0.91	0.18	0.89	0.18	0.76	0.15	0.77	0.21	0.50	0.67	0.77	0.18	0.89	0.25	0.43
13																
14																
15																
16	0.57	0.60	0.41	0.57	0.19	0.63	0.17	0.69	0.13	0.61	0.55	0.64	0.36	0.69	0.33	0.61
17	0.29	0.38	0.32	0.30	0.25	0.23	0.24	0.27	0.29	0.41	0.64	0.49	0.60	0.34	0.18	0.32
18	0.55	0.66	0.30	0.63	0.23	0.41	0.28	0.20	0.39	0.38	0.37	0.61	0.31	0.56	0.41	0.21
19	0.19	0.97	0.19	0.94	0.22	0.67	0.22	0.49	0.23	0.52	0.22	0.75	0.22	0.67	0.26	0.41
20	0.31	1.05	0.20	1.00	0.22	0.81	0.20	0.73	0.18	0.70	0.21	0.68	0.20	0.66	0.19	0.31
21																
22																
23	0.39	0.64	0.41	0.61	0.39	0.33	0.29	0.35	0.29	0.20	2.92	0.31	1.71	0.25	0.31	0.48
24	0.65	0.74	0.37	0.72	0.32	0.38	0.32	0.33	0.28	0.23	1.85	0.36	1.54	0.32	3.14	0.22
25	0.47	0.87	0.38	0.85	0.30	0.60	0.41	0.49	0.21	0.66	0.40	0.69	0.48	0.63	4.62	0.45
26	0.26	0.85	0.21	0.92	0.23	0.70	0.27	0.61	0.21	0.71	0.30	0.86	0.34	0.75	0.42	0.21
27	0.23	0.95	0.25	0.93	0.23	0.74	0.27	0.75	0.33	0.67	0.69	0.94	0.28	0.91	0.25	0.65
28																
29																
30																

TREATED WATER OCTOBER 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	1.17	0.68	0.71	0.65	0.84	0.36	0.66	0.23	0.51	0.27	1.84	0.91	1.85	0.79	1.72	0.58
2	0.52	0.81	0.45	0.78	0.47	0.52	0.49	0.33	0.66	0.22	1.09	1.04	1.30	0.98	1.05	0.51
3	0.38	0.88	0.31	0.85	0.29	0.48	0.33	0.47	0.43	0.48	0.63	0.98	0.48	1.00	0.86	0.24
4	0.37	0.88	0.44	0.86	0.39	0.59	0.23	0.55	0.58	0.57	0.37	1.13	0.39	1.12	0.55	0.24
5																
6																
7	0.24	1.04	0.21	1.01	0.41	0.84	0.20	0.77	0.29	0.60	0.31	0.96	0.33	0.92	0.29	0.78
8	0.19	0.94	0.21	0.91	0.21	0.78	0.26	0.81	0.18	0.74	0.26	0.84	0.31	0.77	0.21	0.41
9	0.20	0.91	0.17	0.88	0.19	0.67	0.23	0.69	0.97	0.48	0.28	0.74	0.24	0.74	0.30	0.35
10	0.17	1.00	0.27	0.97	0.17	0.61	0.17	0.69	0.21	0.45	0.22	0.86	0.26	0.76	0.22	0.26
11	0.27	0.96	0.24	0.94	0.28	0.78	0.18	0.72	0.25	0.73	0.19	0.92	0.26	0.87	0.24	0.24
12																
13																
14																
15	0.19	1.05	0.31	1.04	0.29	0.88	0.16	0.88	0.24	1.00	0.18	1.05	0.14	1.01	0.25	0.57
16	0.21	1.05	0.24	1.02	0.33	0.82	0.19	0.84	0.26	0.77	0.21	1.06	0.15	1.01	0.20	0.63
17	0.26	0.98	0.27	0.96	0.33	0.83	0.26	0.86	0.25	0.96	0.17	0.91	0.17	0.89	0.22	0.58
18	0.32	1.00	0.24	0.97	0.23	0.88	0.18	0.83	0.22	0.78	0.16	0.88	0.17	0.84	0.34	0.61
19																
20																
21	0.49	0.89	0.21	0.87	0.30	0.79	0.21	0.76	0.22	0.85	0.17	0.83	0.13	0.84	0.18	0.54
22	0.16	0.91	0.28	0.88	0.18	0.81	0.20	0.77	0.40	0.78	0.17	0.87	0.13	0.85	0.21	0.52
23	0.19	0.92	0.20	0.90	0.37	0.69	0.16	0.77	0.21	0.74	0.20	0.85	0.18	0.79	0.22	0.44
24	0.18	0.89	0.18	0.86	0.21	0.68	0.29	0.75	0.15	0.64	0.19	0.86	0.18	0.84	0.25	0.49
25	0.16	0.89	0.17	0.87	0.48	0.73	0.18	0.76	0.15	0.55	0.15	0.82	0.16	0.78	0.20	0.50
26																
27																
28	0.14	0.90	0.15	0.88	0.31	0.74	0.18	0.76	0.15	0.71	0.16	0.73	0.23	0.70	0.18	0.45
29	0.15	0.91	0.12	0.88	0.17	0.73	0.13	0.78	0.17	0.77	0.19	0.75	0.13	0.71	0.22	0.42
30	0.17	0.94	0.22	0.92	0.16	0.79	0.16	0.78	0.15	0.57	0.42	0.79	0.14	0.77	0.23	0.35
31	0.15	0.93	0.18	0.92	0.25	0.78	0.20	0.83	0.75	0.74	0.21	0.83	0.26	0.83	2.81	0.34

TREATED WATER NOVEMBER 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.17	0.91	0.19	0.88	0.20	0.76	0.26	0.82	0.18	0.88	0.20	0.84	0.21	0.82	1.32	0.37
2																
3																
4	0.28	0.65	0.33	0.62	0.37	0.42	0.35	0.31	0.26	0.38	0.40	0.96	0.46	0.99	0.43	0.63
5	0.31	0.84	0.43	0.82	0.28	0.58	0.26	0.53	0.31	0.20	0.43	1.13	0.34	1.02	0.43	0.41
6	0.18	1.03	0.23	1.06	0.22	0.71	0.28	0.71	0.21	0.66	0.26	1.06	0.24	1.03	0.30	0.34
7	0.17	1.03	0.29	1.01	0.23	0.85	0.15	0.85	0.20	0.57	0.20	0.96	0.36	0.96	0.33	0.34
8	0.41	0.67	0.46	0.64	0.48	0.45	0.39	0.64	0.50	0.47	0.94	0.73	1.03	0.63	0.45	0.56
9																
10																
11																
12	0.28	1.12	0.39	1.10	0.36	0.89	0.23	0.91	0.17	0.58	0.25	1.15	0.35	1.17	0.39	0.64
13	0.23	0.93	0.40	0.91	0.21	0.74	0.29	0.85	0.20	0.62	0.28	0.90	0.34	0.86	0.41	0.68
14	0.40	0.86	0.19	0.83	0.22	0.69	0.20	0.72	0.17	0.51	0.24	0.80	0.25	0.81	0.26	0.66
15	0.15	0.90	0.24	0.88	0.22	0.62	0.30	0.70	0.22	0.42	0.23	0.85	0.26	0.83	0.28	0.39
16																
17																
18	0.24	0.95	0.37	0.93	0.18	0.73	0.18	0.69	0.12	0.53	0.23	1.05	0.17	1.00	0.20	0.39
19	0.47	0.89	0.18	0.86	0.70	0.74	0.19	0.78	0.17	0.68	0.18	1.02	0.24	1.02	0.21	0.60
20	0.21	0.91	0.30	0.89	0.18	0.65	0.15	0.70	0.14	0.58	0.19	1.00	0.22	0.99	0.21	0.62
21	0.20	1.03	0.33	1.01	0.30	0.89	0.12	0.77	0.38	0.43	0.21	0.97	0.13	0.95	0.31	0.60
22	0.22	0.75	0.08	0.88	0.13	0.71	0.10	0.78	0.30	0.49	0.14	0.88	0.15	0.91	0.25	0.49
23																
24																
25	0.13	0.93	0.28	0.90	0.44	0.74	0.14	0.79	0.20	0.75	0.27	0.87	0.16	0.84	0.99	0.67
26	0.17	0.92	0.19	0.90	0.67	0.72	0.19	0.78	0.38	0.59	0.22	0.82	0.14	0.84	0.61	0.63
27	0.13	0.94	0.27	0.92	0.29	0.77	0.19	0.64	0.13	0.81	0.26	0.80	0.38	0.77	0.26	0.52
28	0.22	0.82	0.46	0.80	0.38	0.72	0.23	0.78	0.20	0.65	0.34	0.77	0.19	0.72	0.36	0.50
29	0.18	0.77	0.14	0.74	0.12	0.65	0.17	0.70	0.12	0.51	0.16	0.85	0.16	0.79	0.20	0.51
30																

TREATED WATER DECEMBER 2013

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1																
2	0.26	0.76	0.30	0.73	0.22	0.55	0.36	0.51	0.25	0.29	0.32	0.98	0.29	0.94	0.33	0.47
3	0.21	1.04	0.30	1.01	0.17	0.73	0.24	0.63	0.15	0.43	0.24	1.23	0.22	1.16	0.24	0.38
4	0.21	0.98	0.25	0.96	0.26	0.81	0.23	0.81	0.18	0.63	0.30	1.13	0.15	1.11	0.24	0.49
5	0.77	0.98	0.20	0.97	0.23	0.80	0.21	0.83	0.17	0.55	0.14	1.00	0.15	1.00	0.30	0.64
6	0.20	0.93	0.27	0.91	0.31	0.79	0.19	0.82	0.20	0.97	0.17	1.01	0.19	0.98	0.21	0.78
7																
8																
9	0.38	1.03	0.16	1.01	0.35	0.94	0.29	0.86	0.19	0.62	0.57	1.01	0.15	0.98	0.51	0.55
10	0.18	0.96	0.24	0.95	0.29	1.08	0.41	0.91	0.18	1.09	0.48	1.02	0.18	1.08	0.37	0.82
11	0.27	1.09	0.79	1.06	0.47	0.93	0.59	0.83	0.15	0.72	0.47	1.03	1.62	0.96	0.39	0.75
12	0.32	1.01	0.73	0.99	0.67	0.75	0.25	0.82	0.31	0.74	0.35	0.98	0.18	0.96	0.32	0.79
13	0.33	0.89	0.33	0.86	0.61	0.74	0.30	0.77	0.14	0.76	0.18	0.89	0.21	0.86	0.36	0.75
14																
15																
16	0.16	0.83	0.24	0.81	0.29	0.73	0.16	0.68	0.13	0.49	0.20	0.91	0.26	0.92	0.29	0.62
17	0.42	0.86	0.23	0.84	0.47	0.77	0.32	0.64	0.52	0.60	0.19	0.95	0.15	0.89	0.19	0.62
18	0.16	0.92	0.40	0.90	0.17	0.74	0.15	0.69	0.12	0.72	0.22	0.92	0.14	0.93	0.31	0.66
19	0.24	0.93	0.38	0.91	0.28	0.67	0.71	0.69	0.15	0.58	0.20	1.23	0.13	1.22	0.48	0.66
20	0.16	1.04	0.32	1.03	0.24	0.78	0.29	0.70	0.30	0.56	0.26	1.17	0.22	1.11	0.34	0.65
21																
22																
23	0.19	0.85	0.33	0.82	0.25	0.84	0.18	0.76	0.18	0.76	0.21	1.02	0.31	1.02	0.28	0.94
24	0.34	0.66	0.18	0.64	0.16	0.52	0.26	0.63	0.14	0.68	0.23	0.90	0.19	0.89	0.39	0.96
25																
26																
27	0.20	0.85	0.42	0.82	0.16	0.65	0.17	0.69	0.28	0.60	0.29	0.89	0.16	0.87	0.23	0.94
28																
29																
30	0.20	0.89	0.24	0.86	0.20	0.67	0.20	0.68	0.20	0.50	0.14	0.88	0.28	0.86	0.25	0.53
31	0.15	0.89	0.27	0.86	0.15	0.70	0.23	0.77	0.13	0.62	0.19	0.90	0.21	0.88	0.26	0.51

	RAW WATER JANUARY 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.72			0.35
2			0.29			0.21
3			0.26			0.22
4			0.55			1.33
5						
6						
7			0.33			0.21
8			0.26			0.27
9			0.27			0.29
10			0.24			0.19
11			0.25			0.15
12						
13						
14			0.53			0.26
15			0.56			0.18
16			0.25			0.39
17			0.40			0.26
18			0.20			0.31
19						
20						
21			0.33			0.19
22			0.22			0.19
23			0.35			0.29
24			0.44			0.19
25			0.25			0.19
26						
27						
28			0.39			0.35
29			0.31			0.21
30			0.70			0.20
31			0.48			0.48

	RAW WATER FEBRUARY 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.37			0.25
2						
3						
4			0.65			0.27
5			0.44			0.26
6			0.22			0.24
7			0.35			0.35
8			0.38			0.30
9						
10						
11			0.28			0.20
12			0.21			0.36
13			0.30			0.26
14			0.25			0.14
15			0.29			0.15
16						
17						
18			0.34			0.16
19			0.44			0.20
20			0.29			0.18
21			0.58			0.19
22			0.50			0.21
23						
24						
25			0.72			0.25
26			0.23			0.18
27			0.25			0.21
28			0.34			0.20
29						

	RAW WATER MARCH 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.56			0.79
2						
3						
4			0.58			0.31
5			0.38			0.20
6			0.37			0.22
7			0.52			0.21
8			0.27			0.30
9						
10						
11			0.29			0.21
12			0.48			0.46
13			0.60			0.68
14			0.60			0.55
15			1.60			0.34
16						
17						
18			0.35			0.25
19			0.21			0.24
20			0.48			0.64
21			0.34			0.23
22			0.21			0.27
23						
24						
25			0.14			0.29
26			0.19			0.16
27			0.57			0.30
28			0.26			0.23
29			0.46			0.30
30						
31						

	RAW WATER APRIL 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.25			0.33
2			0.33			0.27
3			0.31			0.23
4			0.35			0.28
5			0.68			0.70
6						
7						
8			0.24			0.41
9			0.41			0.26
10			0.36			0.40
11			0.26			0.34
12			0.26			0.28
13						
14						
15			0.19			0.27
16			0.35			0.26
17			0.15			0.23
18			0.29			0.19
19			0.28			0.30
20						
21						
22			0.65			0.29
23			0.35			0.37
24			0.25			0.24
25			0.28			0.26
26			0.33			0.23
27						
28						
29			0.48			0.18
30			0.21			0.26

	RAW WATER MAY 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.20			0.22
2			0.22			0.2
3			0.17			0.21
4						
5						
6			0.44			0.49
7			0.36			0.33
8			0.37			0.37
9			0.44			0.37
10			0.40			0.42
11						
12						
13			1.02			1.08
14			0.35			0.36
15			0.25			0.37
16			0.25			0.26
17			0.27			0.21
18						
19						
20			0.44			0.26
21			0.43			0.32
22			0.40			0.32
23			0.59			0.26
24			0.47			0.25
25						
26						
27			0.46			0.26
28			0.79			0.63
29			0.41			0.34
30			0.21			0.51
31			0.27			0.39

	RAW WATER JUNE 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1						
2						
3			1.33			0.25
4			0.44			0.24
5			0.44			0.20
6			0.31			0.27
7			0.17			0.21
8						
9						
10			0.55			0.28
11			0.19			0.27
12			0.14			0.21
13			0.24			0.22
14			0.29			0.28
15						
16						
17			0.33			0.21
18			0.25			0.20
19			0.25			0.22
20			0.24			0.26
21			0.29			0.25
22						
23						
24			0.38			0.44
25			0.24			0.38
26			0.29			0.34
27			0.32			0.37
28			0.15			0.32
29						
30						

	RAW WATER JULY 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.31			0.34
2			0.54			0.28
3			0.22			0.28
4			0.22			0.26
5			0.17			0.22
6						
7						
8			0.65			0.51
9			0.34			0.27
10			0.37			0.14
11			0.30			0.17
12			0.15			0.20
13						
14						
15			1.34			0.22
16			0.36			0.14
17			0.23			0.18
18			0.17			0.14
19			0.18			0.22
20						
21						
22			1.38			0.18
23			0.39			0.17
24			0.28			0.15
25			0.23			0.14
26			0.36			0.25
27						
28						
29			0.92			0.24
30			0.21			0.13
31			0.20			0.14

	RAW WATER AUGUST 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.17			0.24
2			0.18			0.16
3						
4						
5						
6			2.17			0.79
7			0.29			0.28
8			0.47			0.59
9			0.41			0.18
10						
11						
12			1.32			0.26
13			0.34			0.14
14			0.59			0.14
15			0.49			0.21
16			0.68			0.16
17						
18						
19			2.16			0.16
20			0.74			0.17
21			1.05			0.17
22			0.67			0.13
23			0.64			0.15
24						
25						
26			2.36			0.12
27			1.02			0.16
28			0.95			0.19
29			0.77			0.49
30			5.14			16.00
31						

	RAW WATER SEPTEMBER 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1						
2			1.31			1.27
3			0.47			0.40
4			0.64			0.32
5			0.34			0.27
6			0.52			0.29
7						
8						
9			0.68			0.27
10			0.66			0.19
11			0.60			0.33
12			0.65			0.21
13						
14						
15						
16			1.29			1.79
17			0.60			0.30
18			0.30			0.23
19			0.18			0.20
20			0.19			0.17
21						
22						
23			0.28			4.60
24			0.72			0.65
25			0.48			0.31
26			0.27			0.23
27			0.33			1.54
28						
29						
30						

	RAW WATER OCTOBER 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			1.24			0.65
2			0.32			0.42
3			0.37			0.34
4			0.31			0.32
5						
6						
7			0.43			0.26
8			0.37			0.23
9			0.36			0.19
10			0.37			0.21
11			0.33			0.20
12						
13						
14						
15			0.64			0.23
16			0.44			0.18
17			0.33			0.20
18			0.28			0.19
19						
20						
21			1.02			0.23
22			0.42			0.22
23			0.16			0.15
24			0.38			0.16
25			0.57			0.17
26						
27						
28			0.92			0.18
29			0.26			0.23
30			0.32			0.15
31			0.52			0.20

	RAW WATER NOVEMBER 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.36			0.17
2						
3						
4			0.26			0.29
5			0.20			0.21
6			0.14			0.27
7			0.78			2.75
8			0.36			0.41
9						
10						
11						
12			0.23			0.40
13			0.27			0.25
14			0.34			0.22
15			0.34			0.19
16						
17						
18			0.22			0.30
19			0.26			0.16
20			0.20			0.18
21			0.16			0.16
22			0.11			0.15
23						
24						
25			0.26			0.15
26			0.19			0.17
27			0.21			0.17
28			0.20			0.27
29			0.40			0.19
30						

	RAW WATER DECEMBER 2013					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1						
2			0.29			0.21
3			0.20			0.16
4			0.21			0.16
5			0.16			0.14
6			0.21			0.21
7						
8						
9			0.36			0.18
10			0.13			0.24
11			0.21			0.14
12			0.19			0.16
13			0.33			0.36
14						
15						
16			0.28			0.13
17			0.15			0.14
18			0.21			0.19
19			0.18			0.23
20			0.63			0.50
21						
22						
23			0.73			0.31
24			0.21			0.15
25						
26						
27			0.51			0.18
28						
29						
30			0.32			0.23
31			0.26			0.21

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

ANNUAL REPORT

2013

Appendix C

Water Chemistry Test Results

VILLAGE OF LIONS BAY
ATTN: Chuck Partridge
PO Box 141, 400 Center Road
Lions Bay BC V0N 2E0

Date Received: 11-MAR-13
Report Date: 22-MAR-13 17:57 (MT)
Version: FINAL

Client Phone: 604-921-9833

Certificate of Analysis

Lab Work Order #: L1277470

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 10-207091, 10-292038
Legal Site Desc:

Selam Worku
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1277470-1 Treat.W. 11-MAR-13 10:10 HARVEY TANK (FIRST DRAW)	L1277470-2 Treat.W. 11-MAR-13 10:10 HARVEY TANK (AFTER FLUSH)	L1277470-3 Treat.W. 11-MAR-13 12:10 PRV-3 (FIRST DRAW)	L1277470-4 Treat.W. 11-MAR-13 12:10 PRV-3 (AFTER FLUSH)	L1277470-5 Treat.W. 11-MAR-13 08:25 STORE/CAFE (FIRST DRAW)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	6.28		5.70		5.83
	pH (pH)	7.48		7.13		7.05
	Total Suspended Solids (mg/L)	<3.0		<3.0		<3.0
	Turbidity (NTU)	0.13		0.22		0.34
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	6.7		7.1		5.8
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	0.94		1.00		1.06
Total Metals	Aluminum (Al)-Total (mg/L)	0.069	0.040	0.037	0.038	0.034
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	2.12	2.19	1.91	1.99	1.97
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0438	0.0028	0.388	0.0039	0.0612
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	0.043
	Lead (Pb)-Total (mg/L)	0.00150	<0.00050	0.00308	<0.00050	0.00252
	Magnesium (Mg)-Total (mg/L)	0.24	0.23	0.23	0.24	0.22
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	2.0	<2.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	0.118	<0.050	<0.050
Aggregate Organics	BOD (mg/L)	<2.0		<2.0		<2.0
Trihalomethanes	Bromodichloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Bromoform (mg/L)	<0.0010		<0.0010		<0.0010
	Dibromochloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Chloroform (mg/L)	0.0154		0.0156		0.0189
	Total THMs (mg/L)	0.0154		0.0156		0.0189

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1277470-6 Treat.W. 11-MAR-13 08:25 STORE/CAFE (AFTER FLUSH)	L1277470-7 Treat.W. 11-MAR-13 11:55 LIONS BAY AVENUE (FIRST DRAW)	L1277470-8 Treat.W. 11-MAR-13 11:55 LIONS BAY AVENUE (AFTER FLUSH)	L1277470-9 Treat.W. 11-MAR-13 13:10 KELVIN GROVE (FIRST DRAW)	L1277470-10 Treat.W. 11-MAR-13 13:10 KELVIN GROVE (AFTER FLUSH)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)		5.69		6.98	
	pH (pH)		7.06		7.05	
	Total Suspended Solids (mg/L)		<3.0		<3.0	
	Turbidity (NTU)		0.16		0.32	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		6.6		7.4	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		0.77		0.84	
Total Metals	Aluminum (Al)-Total (mg/L)	0.037	0.027	0.037	0.032	0.039
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	1.97	1.93	2.00	2.45	2.44
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0166	0.546	0.0052	0.168	0.0038
	Iron (Fe)-Total (mg/L)	0.036	<0.030	<0.030	0.044	0.041
	Lead (Pb)-Total (mg/L)	<0.00050	0.00104	<0.00050	0.0173	0.00052
	Magnesium (Mg)-Total (mg/L)	0.22	0.21	0.22	0.21	0.20
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)		<2.0		<2.0	
Trihalomethanes	Bromodichloromethane (mg/L)		<0.0010		<0.0010	
	Bromoform (mg/L)		<0.0010		<0.0010	
	Dibromochloromethane (mg/L)		<0.0010		<0.0010	
	Chloroform (mg/L)		0.0196		0.0261	
	Total THMs (mg/L)		0.0196		0.0261	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1277470-11 Treat.W. 11-MAR-13 10:55 MAGNESIA TANK (FIRST DRAW)	L1277470-12 Treat.W. 11-MAR-13 10:55 MAGNESIA TANK (AFTER FLUSH)	L1277470-13 Treat.W. 11-MAR-13 11:25 PRV-5 (FIRST DRAW)	L1277470-14 Treat.W. 11-MAR-13 11:25 PRV-5 (AFTER FLUSH)	L1277470-15 Treat.W. 11-MAR-13 12:30 BRUNSWICK BEACH (FIRST DRAW)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	12.1		5.78		11.2
	pH (pH)	6.99		7.01		7.04
	Total Suspended Solids (mg/L)	<3.0		<3.0		<3.0
	Turbidity (NTU)	0.16		0.33		0.28
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	8.1		6.9		7.3
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	0.57		0.69		0.53
Total Metals	Aluminum (Al)-Total (mg/L)	0.032	0.025	0.044	0.039	0.014
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00015	<0.00010	<0.00010	<0.00010	<0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	0.00038	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	3.99	4.18	1.93	1.90	3.73
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.925	0.0105	0.0119	0.0045	0.469
	Iron (Fe)-Total (mg/L)	1.99	<0.030	0.159	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	0.00669	<0.00050	<0.00050	<0.00050	0.00089
	Magnesium (Mg)-Total (mg/L)	0.52	0.54	0.23	0.23	0.45
	Manganese (Mn)-Total (mg/L)	0.0065	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	2.8	3.0	<2.0	<2.0	2.7
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	0.487	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)	<2.0		<2.0		<2.0
Trihalomethanes	Bromodichloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Bromoform (mg/L)	<0.0010		<0.0010		<0.0010
	Dibromochloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Chloroform (mg/L)	0.0117		0.0155		0.0184
	Total THMs (mg/L)	0.0117		0.0155		0.0184

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1277470-16 Treat.W. 11-MAR-13 12:30 BRUNSWICK BEACH (AFTER FLUSH)	L1277470-17 Treat.W. 11-MAR-13 08:00 ELEMENTARY SCHOOL (FIRST DRAW)	L1277470-18 Treat.W. 11-MAR-13 08:00 ELEMENTARY SCHOOL (AFTER FLUSH)	L1277470-19 Treat.W. 11-MAR-13 08:50 COMMUNITY CENTRE (FIRST DRAW)	L1277470-20 Treat.W. 11-MAR-13 08:50 COMMUNITY CENTRE (AFTER FLUSH)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)		13.4		6.41	
	pH (pH)		6.99		6.94	
	Total Suspended Solids (mg/L)		<3.0		<3.0	
	Turbidity (NTU)		0.17		0.15	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		5.8		5.3	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		0.78		0.97	
Total Metals	Aluminum (Al)-Total (mg/L)	0.025	0.013	0.027	0.037	0.034
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	0.00034	<0.00020	0.00021
	Calcium (Ca)-Total (mg/L)	4.21	4.47	2.11	2.21	1.94
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0068	0.572	1.08	0.0692	0.0603
	Iron (Fe)-Total (mg/L)	<0.030	0.084	0.079	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	0.0303	0.0122	0.00140	0.00070
	Magnesium (Mg)-Total (mg/L)	0.52	0.55	0.22	0.22	0.21
	Manganese (Mn)-Total (mg/L)	<0.0020	0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	2.8	2.8	<2.0	<2.0	<2.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	0.397	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)		<2.0		<2.0	
Trihalomethanes	Bromodichloromethane (mg/L)		<0.0010		<0.0010	
	Bromoform (mg/L)		<0.0010		<0.0010	
	Dibromochloromethane (mg/L)		<0.0010		<0.0010	
	Chloroform (mg/L)		0.0309		0.0195	
	Total THMs (mg/L)		0.0309		0.0195	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L1277470-21 Description: Treat.W. Sampled Date: 11-MAR-13 Sampled Time: 07:40 Client ID: KIDDLEY WINKS PRESCHOOL (FIRST DRAW)	L1277470-22 Treat.W. 11-MAR-13 07:40 KIDDLEY WINKS PRESCHOOL (AFTER FLUSH)	L1277470-23 Raw W. 11-MAR-13 10:20 HARVEY RAW WATER (FIRST DRAW)	L1277470-24 Raw W. 11-MAR-13 10:20 HARVEY RAW WATER (AFTER FLUSH)	L1277470-25 Raw W. 11-MAR-13 11:05 MAGNESIA RAW WATER (FIRST DRAW)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	7.21				
	pH (pH)	7.01		6.96		6.95
	Total Suspended Solids (mg/L)	<3.0		<3.0		<3.0
	Turbidity (NTU)	0.23		0.32		0.16
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	7.3		5.0		5.5
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	0.84		0.71		0.60
Total Metals	Aluminum (Al)-Total (mg/L)	0.033	0.038		0.039	
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050		<0.00050	
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010		<0.00010	
	Barium (Ba)-Total (mg/L)	<0.020	<0.020		<0.020	
	Boron (B)-Total (mg/L)	<0.10	<0.10		<0.10	
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020		<0.00020	
	Calcium (Ca)-Total (mg/L)	2.35	1.93		1.91	
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020		<0.0020	
	Copper (Cu)-Total (mg/L)	0.662	0.0284		0.0059	
	Iron (Fe)-Total (mg/L)	<0.030	<0.030		<0.030	
	Lead (Pb)-Total (mg/L)	0.103	<0.00050		<0.00050	
	Magnesium (Mg)-Total (mg/L)	0.32	0.24		0.24	
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020		<0.0020	
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020		<0.00020	
	Potassium (K)-Total (mg/L)	<0.10	<0.10		<0.10	
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010		<0.0010	
	Sodium (Na)-Total (mg/L)	<2.0	<2.0		<2.0	
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010		<0.00010	
	Zinc (Zn)-Total (mg/L)	0.128	<0.050		<0.050	
Aggregate Organics	BOD (mg/L)	<2.0		<2.0		<2.0
Trihalomethanes	Bromodichloromethane (mg/L)	<0.0010				
	Bromoform (mg/L)	<0.0010				
	Dibromochloromethane (mg/L)	<0.0010				
	Chloroform (mg/L)	0.0161				
	Total THMs (mg/L)	0.0161				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1277470-26				
	Description	Raw W.				
	Sampled Date	11-MAR-13				
	Sampled Time	11:05				
	Client ID	MAGNESIA RAW WATER (AFTER FLUSH)				
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)					
	pH (pH)					
	Total Suspended Solids (mg/L)					
	Turbidity (NTU)					
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)					
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)					
Total Metals	Aluminum (Al)-Total (mg/L)	0.024				
	Antimony (Sb)-Total (mg/L)	<0.00050				
	Arsenic (As)-Total (mg/L)	0.00013				
	Barium (Ba)-Total (mg/L)	<0.020				
	Boron (B)-Total (mg/L)	<0.10				
	Cadmium (Cd)-Total (mg/L)	<0.00020				
	Calcium (Ca)-Total (mg/L)	4.30				
	Chromium (Cr)-Total (mg/L)	<0.0020				
	Copper (Cu)-Total (mg/L)	0.0049				
	Iron (Fe)-Total (mg/L)	<0.030				
	Lead (Pb)-Total (mg/L)	<0.00050				
	Magnesium (Mg)-Total (mg/L)	0.58				
	Manganese (Mn)-Total (mg/L)	<0.0020				
	Mercury (Hg)-Total (mg/L)	<0.00020				
	Potassium (K)-Total (mg/L)	<0.10				
	Selenium (Se)-Total (mg/L)	<0.0010				
	Sodium (Na)-Total (mg/L)	<2.0				
	Uranium (U)-Total (mg/L)	<0.00010				
	Zinc (Zn)-Total (mg/L)	<0.050				
Aggregate Organics	BOD (mg/L)					
Trihalomethanes	Bromodichloromethane (mg/L)					
	Bromoform (mg/L)					
	Dibromochloromethane (mg/L)					
	Chloroform (mg/L)					
	Total THMs (mg/L)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Copper (Cu)-Total	MS-B	L1277470-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Total Organic Carbon	MS-B	L1277470-1, -11, -13, -15, -17, -19, -21, -23, -25, -3, -5, -7, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	EPA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

BOD5-VA Water Biochemical Oxygen Demand- 5 day APHA 5210 B- "BIOCHEMICAL OXYGEN DEMAND"

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

BOD5-VA Water Biochemical Oxygen Demand- 5 day APHA 5210 B- BIOCHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-TOT-CVAFS-VA Water Total Mercury in Water by CVAFS EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

THM-HSMS-VA Water VOC (THM) by Headspace GCMS EPA SW-846, METHOD 8260

This procedure is suitable for the analysis of trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) in chlorinated waters that have been treated to prevent the formation of trihalomethanes after sample collection. The analysis involves the headspace extraction of the sample prior to analysis by capillary column gas chromatography with mass spectrometric detection (GC/MS). The trihalomethanes

Reference Information

analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 8260, published by the United States Environmental Protection Agency (EPA).

THM-SUM-CALC-VA	Water	Total Trihalomethane-THM	CALCULATION

Total Trihalomethanes (where not conducted as part of a formation potential analysis) is equal to the sum of the individual parameter concentrations with non-detect results treated as zero.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-207091 10-292038

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Short Holding Time

Rush Processing

L1277470-COFC

10- 292038

Page 1 of 2

Report To	Report Format / Distribution	Service Request: (Rush subject to availability - Contact ALS to confirm TAT)
Company: VILLAGE OF LIONS BAY	Standard: Other (specify):	✓ Regular (Standard Turnaround Times - Business Days)
Contact: CHUCK PARTRIDGE	Select: PDF Excel Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address: 400 CENTRE RD.	Email 1:	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
LIONS BAY, BC	Email 2:	Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone: 604 921 9833 Fax:		

Invoice To	Client / Project Information
Same as Report ? (circle) Yes or No (if No, provide details)	Job #:
Copy of Invoice with Report? (circle) Yes or No	PO / AFE:
Company:	LSD:
Contact:	
Address:	Quote #:
Phone: Fax:	

Lab Work Order # (lab use only): L1277470 **ALS Contact:** SELAM WORKU **Sampler:** RU

Analysis Request (Indicate Filtered or Preserved, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Hardness	pH	TSS	BOD	Turbidity	Alkalinity Total	Total Metals	(First Draw)	Total Metals	(After Flush)	TOC	THM's	Number of Containers
1	HARVEY TANK	MAR. 11/13	10:10	Treat. W.	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
2	PRV-3	"	12:10	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
3	STONE / LAFFE	"	8:25	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
4	LIONS BAY AVENUE	"	11:55	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
5	KELVIN GROVE	"	13:10	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
6	MAGNESIA TANK	"	10:55	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
7	PRV-5	"	11:25	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
8	BRUNSWICK BEACH	"	12:30	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
9	ELEMENTARY SCHOOL	"	8:00	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
10	COMMUNITY CENTRE	"	8:50	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
11	KIDDLEY WINKS PRESCHOOL	"	7:40	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
12	HARVEY RAW WATER	"	10:20	RAW W.	✓	✓	✓	✓	✓	✓			✓		✓		

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			[illegible]	Mar. 11	15:25	4/6 °C				

10- 207091

ALS Environmental

Chain of Custody / Anal
Canada Toll Free:
www.alsglol

L1277470-COFC

Page 2 of 2

Report To		Report Format / Distribution		Service Request:(Rush subject to availability - Contact ALS to confirm TAT)
Company:	VILLAGE OF LIONS BAY	Standard:	Other (specify):	✓ Regular (Standard Turnaround Times - Business Days)
Contact:	CHUCK PANTRIDGE	Select: PDF	Excel Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address:	400 CENTRE RD.	Email 1:		Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
	LIONS BAY, BC	Email 2:		Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone:	604 921 9833 Fax:			
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	Client / Project Information		
	Copy of Invoice with Report? (circle) Yes or No	Job #:		
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)	L1277470	ALS Contact:	SELAN WONUN	Sampler: AU

Analysis Request

(Indicate Filtered or Preserved, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	HARDNESS	pH	TSS	BOD	TURBIDITY	ALKALINITY TOT.	TOTAL METALS	(FIRST DRAW)	TOTAL METALS	(AFTER FLUSH)	TOC	THM'S	Number of Containers
13	MAGNESIA RAW WATER	MAR.11/13	11:05	RAW W.	✓	✓	✓	✓	✓	✓			✓		✓		

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			[illegible]	Mar. 11	15:25	4 / 6 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

VILLAGE OF LIONS BAY
ATTN: FAROUK ZABA
PO Box 141, 400 Center Road
Lions Bay BC V0N 2E0

Date Received: 23-SEP-13
Report Date: 04-OCT-13 17:40 (MT)
Version: FINAL

Client Phone: 604-921-9833

Certificate of Analysis

Lab Work Order #: L1367102

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 10-300485
Legal Site Desc:

Selam Worku
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1367102-1	L1367102-2	L1367102-3	L1367102-4	L1367102-5
	Description	Treat. W.	Treat. W.	Treat. W.	Treat. W.	Treat. W.
	Sampled Date	23-SEP-13	23-SEP-13	23-SEP-13	23-SEP-13	23-SEP-13
	Sampled Time	13:00	13:00	14:50	14:50	08:10
	Client ID	HARVEY TANK (FIRST DRAW)	HARVEY TANK (AFTER FLUSH)	PRV-3 (FIRST DRAW)	PRV-3 (AFTER FLUSH)	STORE/CAFE (FIRST DRAW)
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	4.98	4.92	4.76	4.72	6.39
	pH (pH)	7.09		7.05		7.00
	Total Suspended Solids (mg/L)	<3.0		<3.0		<3.0
	Turbidity (NTU)	0.34		0.31		0.19
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	5.5		5.3		5.1
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.91		1.79		1.52
Total Metals	Aluminum (Al)-Total (mg/L)	0.076	0.077	0.075	0.073	0.028
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00010	0.00013	0.00012	0.00013	0.00011
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	1.69	1.67	1.61	1.60	2.16
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0053	0.0050	0.0078	0.0060	0.108
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.0139
	Magnesium (Mg)-Total (mg/L)	0.18	0.18	0.18	0.18	0.24
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	0.13	0.14	0.12	0.14	0.16
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	2.2	2.1	2.2	2.1	2.1
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)	<2.0		<2.0		<2.0
Trihalomethanes	Bromodichloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Bromoform (mg/L)	<0.0010		<0.0010		<0.0010
	Dibromochloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Chloroform (mg/L)	0.0526		0.0557		0.0554
	Total THMs (mg/L)	0.0526		0.0557		0.0554

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1367102-6 Treat. W. 23-SEP-13 08:10 STORE/CAFE (AFTER FLUSH)	L1367102-7 Treat. W. 23-SEP-13 09:05 LIONS BAY AVENUE (FIRST DRAW)	L1367102-8 Treat. W. 23-SEP-13 09:05 LIONS BAY AVENUE (AFTER FLUSH)	L1367102-9 Treat. W. 23-SEP-13 15:15 KELVIN GROVE (FIRST DRAW)	L1367102-10 Treat. W. 23-SEP-13 15:15 KELVIN GROVE (AFTER FLUSH)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	5.78	6.39	6.13	8.66	7.30
	pH (pH)		7.10		7.23	
	Total Suspended Solids (mg/L)		<3.0		<3.0	
	Turbidity (NTU)		0.20		0.31	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		6.0		6.5	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		1.24		1.64	
Total Metals	Aluminum (Al)-Total (mg/L)	0.049	0.032	0.042	0.042	0.063
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00011	0.00011	0.00013	0.00011	0.00014
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	2.00	2.18	2.09	3.10	2.65
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0175	0.185	0.0038	0.0542	0.0031
	Iron (Fe)-Total (mg/L)	0.040	<0.030	<0.030	0.039	0.035
	Lead (Pb)-Total (mg/L)	<0.00050	0.00101	<0.00050	0.0117	0.00155
	Magnesium (Mg)-Total (mg/L)	0.19	0.23	0.22	0.22	0.17
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	0.14	0.17	0.17	0.15	0.16
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	2.1	2.2	2.0	2.3	2.1
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)		<2.0		<2.0	
Trihalomethanes	Bromodichloromethane (mg/L)		<0.0010		<0.0010	
	Bromoform (mg/L)		<0.0010		<0.0010	
	Dibromochloromethane (mg/L)		<0.0010		<0.0010	
	Chloroform (mg/L)		0.0570		0.0752	
	Total THMs (mg/L)		0.0570		0.0752	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1367102-11	L1367102-12	L1367102-13	L1367102-14	L1367102-15
	Description	Treat. W.	Treat. W.	Treat. W.	Treat. W.	Treat. W.
	Sampled Date	23-SEP-13	23-SEP-13	23-SEP-13	23-SEP-13	23-SEP-13
	Sampled Time	13:50	13:50	14:35	14:35	09:45
	Client ID	MAGNESIA TANK (FIRST DRAW)	MAGNESIA TANK (AFTER FLUSH)	PRV-5 (FIRST DRAW)	PRV-5 (AFTER FLUSH)	BRUNSWICK BEACH (FIRST DRAW)
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	9.00	9.07	9.11	9.01	14.2
	pH (pH)	6.94		6.95		7.07
	Total Suspended Solids (mg/L)	3.1		<3.0		<3.0
	Turbidity (NTU)	1.89		1.13		0.58
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.0		3.9		6.2
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.67		1.67		0.92
Total Metals	Aluminum (Al)-Total (mg/L)	0.181	0.207	0.110	0.103	0.016
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00027	0.00027	0.00020	0.00019	0.00011
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	3.00	3.01	3.06	3.03	4.90
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0108	0.0147	0.0128	0.0068	0.328
	Iron (Fe)-Total (mg/L)	0.137	0.167	0.066	0.065	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00115
	Magnesium (Mg)-Total (mg/L)	0.37	0.37	0.35	0.35	0.49
	Manganese (Mn)-Total (mg/L)	0.0047	0.0054	0.0025	0.0024	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	0.13	0.13	0.13	0.12	0.14
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	2.3	2.4	2.3	2.3	2.7
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)	<2.0		<2.0		<2.0
Trihalomethanes	Bromodichloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Bromoform (mg/L)	<0.0010		<0.0010		<0.0010
	Dibromochloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Chloroform (mg/L)	0.0398		0.0420		0.0358
	Total THMs (mg/L)	0.0398		0.0420		0.0358

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1367102-16 Treat. W. 23-SEP-13 09:45 BRUNSWICK BEACH (AFTER FLUSH)	L1367102-17 Treat. W. 23-SEP-13 07:50 ELEMENTARY SCHOOL (FIRST DRAW)	L1367102-18 Treat. W. 23-SEP-13 07:50 ELEMENTARY SCHOOL (AFTER FLUSH)	L1367102-19 Treat. W. 23-SEP-13 08:45 COMMUNITY CENTRE (FIRST DRAW)	L1367102-20 Treat. W. 23-SEP-13 08:45 COMMUNITY CENTRE (AFTER FLUSH)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	13.2	13.8	13.0	6.70	6.00
	pH (pH)		7.06		7.09	
	Total Suspended Solids (mg/L)		<3.0		<3.0	
	Turbidity (NTU)		0.78		0.19	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		5.5		5.5	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		1.02		1.32	
Total Metals	Aluminum (Al)-Total (mg/L)	0.048	<0.010	0.080	0.013	0.052
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00017	<0.00010	0.00019	<0.00010	0.00013
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	4.49	4.69	4.44	2.27	2.08
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0047	0.741	0.0918	0.724	0.0633
	Iron (Fe)-Total (mg/L)	0.034	0.042	0.087	<0.030	0.038
	Lead (Pb)-Total (mg/L)	<0.00050	0.0275	0.00210	0.0100	0.00101
	Magnesium (Mg)-Total (mg/L)	0.47	0.51	0.47	0.25	0.19
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	0.0040	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	0.14	0.12	0.14	0.16	0.16
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	2.8	2.7	2.7	2.1	2.1
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	0.131	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)		<2.0		<2.0	
Trihalomethanes	Bromodichloromethane (mg/L)		<0.0010		<0.0010	
	Bromoform (mg/L)		<0.0010		<0.0010	
	Dibromochloromethane (mg/L)		<0.0010		<0.0010	
	Chloroform (mg/L)		0.0433		0.0588	
	Total THMs (mg/L)		0.0433		0.0588	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1367102-21	L1367102-22			
	Description	Raw W.	Raw W.			
	Sampled Date	23-SEP-13	23-SEP-13			
	Sampled Time	13:05	13:55			
	Client ID	HARVEY RAW WATER	MAGNESIA RAW WATER			
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	3.93	10.1			
	pH (pH)	6.41	6.90			
	Total Suspended Solids (mg/L)	<3.0	53.1			
	Turbidity (NTU)	0.38	19.0			
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	3.1	3.4			
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.52	4.03			
Total Metals	Aluminum (Al)-Total (mg/L)	0.091	2.23			
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050			
	Arsenic (As)-Total (mg/L)	0.00013	0.00203			
	Barium (Ba)-Total (mg/L)	<0.020	<0.020			
	Boron (B)-Total (mg/L)	<0.10	<0.10			
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020			
	Calcium (Ca)-Total (mg/L)	1.31	2.73			
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020			
	Copper (Cu)-Total (mg/L)	0.0057	0.0106			
	Iron (Fe)-Total (mg/L)	<0.030	2.56			
	Lead (Pb)-Total (mg/L)	<0.00050	0.00246			
	Magnesium (Mg)-Total (mg/L)	0.16	0.80			
	Manganese (Mn)-Total (mg/L)	<0.0020	0.0542			
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020			
	Potassium (K)-Total (mg/L)	0.12	0.23			
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010			
	Sodium (Na)-Total (mg/L)	<2.0	<2.0			
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010			
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050			
Aggregate Organics	BOD (mg/L)	<2.0	<2.0			
Trihalomethanes	Bromodichloromethane (mg/L)					
	Bromoform (mg/L)					
	Dibromochloromethane (mg/L)					
	Chloroform (mg/L)					
	Total THMs (mg/L)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Total Organic Carbon	MS-B	L1367102-1, -11, -13, -15, -17, -19, -21, -22, -3, -7, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	EPA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

BOD5-VA Water Biochemical Oxygen Demand- 5 day APHA 5210 B- "BIOCHEMICAL OXYGEN DEMAND"

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

BOD5-VA Water Biochemical Oxygen Demand- 5 day APHA 5210 B- BIOCHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-TOT-CVAFS-VA Water Total Mercury in Water by CVAFS EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

Reference Information

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

THM-HSMS-VA	Water	VOC (THM) by Headspace GCMS	EPA SW-846, METHOD 8260

This procedure is suitable for the analysis of trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) in chlorinated waters that have been treated to prevent the formation of trihalomethanes after sample collection. The analysis involves the headspace extraction of the sample prior to analysis by capillary column gas chromatography with mass spectrometric detection (GC/MS). The trihalomethanes analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 8260, published by the United States Environmental Protection Agency (EPA).

THM-SUM-CALC-VA	Water	Total Trihalomethane-THM	CALCULATION

Total Trihalomethanes (where not conducted as part of a formation potential analysis) is equal to the sum of the individual parameter concentrations with non-detect results treated as zero.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-300485

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Short Holding Time

ALS Environmental

Rush Processing

Chain of Custody
Canada To
ww

L1367102-COFC

10- 300485

Page 1 of 1

Report To		Report Format / Distribution		Service Request: (Rush subject to availability - Contact ALS to confirm TAT)
Company:	Village of Lions Bay	Standard:	Other (specify):	✓ Regular (Standard Turnaround Times - Business Days)
Contact:	Farouk Zaba	Select: PDF	Excel Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address:	400 Centre Rd. Lions Bay, BC	Email 1:		Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
Phone:	604 921 9833 Fax:	Email 2:		Same Day or Weekend Emergency - Contact ALS to confirm TAT
Invoice To	Same as Report ? (circle) Yes or No (If No, provide details)	Client / Project Information		Analysis Request
	Copy of Invoice with Report? (circle) Yes or No	Job #:		(Indicate Filtered or Preserved, F/P)
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)	L1367102	ALS Contact: Selam Wonuu	Sampler: MN	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Hardness	pH	TSS	BOD	Turbidity	Alkalinity Total	Total Metals	(First Draw)	Total Metals	(After Flush)	TOC	THM's	Number of Containers
1	Harvey Tank	Sept. 23/13	13:00	Treat. W.	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
2	PRV-3	"	14:50	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
3	Store / Café	"	8:10	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
4	Lions Bay Avenue	"	9:05	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
5	Kelvin Grove	"	15:15	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
6	Magnesia Tank	"	13:50	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
7	PRV-5	"	14:35	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
8	Brunswick Beach	"	9:45	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
9	Elementary School	"	7:50	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
10	Community Centre	"	8:45	" "	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	
11	Harvey Raw Water	"	13:05	Raw W.	✓	✓	✓	✓	✓	✓			✓		✓		
12	Magnesia Raw Water	"	13:55	" "	✓	✓	✓	✓	✓	✓			✓		✓		

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by: YC	Date: Sep 23	Time: 17:20	Temperature: 9.9 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

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Appendix D

Emergency Response Plan

CONTENTS

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Earthquakes	2D
Fire in the Watershed	3D
Water Pump Failure	3D
Chemical Contamination	3D
Disinfection Interruption	3D
Loss of Pressure	4D
Turbidity Events	4D
Water Line Breaks	4D

BOIL WATER ADVISORY

If there is a need, or if Vancouver Coastal Health Authority (VCHA) orders the Village to issue a Boil Water Advisory (BWA):

- Notify the Manager of Public Works or his designated (person in charge),
- Identify the affected area,
- The person in charge will contact the Public Health Inspector (PHI),
- The person in charge will copy and have delivered by hand a printed BWA and post a notice at Lions bay School, Lions Bay Post Office, Lions Bay General Store / Café, and Child Care facilities,
- The person in charge will, when appropriate, notify the radio and television stations that are listed in the plan,
- When it has been determined that all hazards and problems have been alleviated, the PHI will lift the BWA,
- The person in charge will reverse the above actions notifying all those concerned, and
- The person in charge will record all of the pertinent information regarding the event and prepare a report for the Medical Health Officer.

POWER FAILURES

In the event of a Power Failure:

- Notify the Manager of Public Works or his designated,
- Determine the extent of the outage,
- Notify BC Hydro,
- During the power outage, the power generators at the Treatment Plants need to be checked constantly for level of Fuel.
- Monitor the tanks levels,
- Monitor and record the Chlorine Residual in the system,
- When the power comes back on, check the Plants for normal function.
- Reset all alarms, and
- Reset all the pumps including the STP.

EARTHQUAKES

In the event of an earthquake:

- Notify the Manager of Public Works or his designated,
- Begin a system wide check for leaks or any other failures,
- Shut down any areas that appear to have problems,
- Notify VCHA if sections have been shut down and if necessary issue a BWA,
- Repair and flush lines with treated water, and
- Retest all zones and monitor.

FIRE IN THE WATERSHED

In the event of a forest fire in the watershed:

- Notify the Manager of Public Works or his designated,
- Notify BC Department of Forest,
- Call 911 and let them dispatch the affected Fire Department,
- Shut down the system at the affected intake,
- Notify Vancouver Coastal Health Authority,
- Notify Council,
- Monitor Raw Water for any contaminants, and
- Let BC Forest service know that we have an intake below and that we need to know if they are going to water bomb with any chemicals.

WATER PUMP FAILURE

In the event of a pump failure:

- Notify the Manager of Public Works or his designated,
- Shut down the affected pump,
- Notify all affected residents, and
- Change or repair pump and flush the affected area with treated water.

CHEMICAL CONTAMINATION

In the event of Chemical contamination such as oil, fuel, pesticides or any other type of substance that gets into or threatens to get into our water system including forest fire fighting activities:

- Notify the Manager of Public Works or his designated,
- Shut down the affected intake or line,
- Begin determining the extent of contamination,
- Notify Vancouver Coastal Health Authority who will issue a “No Use Order”,
- Call the listed radio and television stations and have them broadcast a “No Use Order” to the affected area,
- Hand deliver “Do Not Use Water” notices to the affected areas,
- Remedy the problem to the satisfaction of the Vancouver Coastal Health Authority, and
- Notify all those affected that the water is now safe to use again.

DISINFECTION INTERRUPTION

In the event of an interruption of the Treatment Plant:

- Notify the Manager of Public Works or his designated,
- Check and record the Chlorine Residual in the affected water tank,
- Shut down the Treatment Plant,

- Shut down the intake valve for the water tank,
- Determine the amount of down time that is available before we need to refill the water tank,
- Begin repairs on the Treatment Plant,
- If the downtime is going to be too long and we have to fill the tank, notify Vancouver Coastal Health Authority and issue a BWA, and
- Add chlorine to reservoir manually and check residual on ongoing basis.

LOSS OF PRESSURE

In the event of a system pressure loss due to high demand from high fire flow or a severe leak:

- Notify the Manager of Public Works or his designated,
- Determine if there was a negative pressure or if there was always positive pressure,
- If a negative pressure is suspected, notify Vancouver Coastal Health Authority who will determine if we need to issue a BWA, and
- Flush the affected area and record the results and give them to the Health Inspector.

TURBIDITY EVENTS

If the Turbidity is in the range of 1-3 NTU, increase monitoring. If the Turbidity reaches 4 NTU prepare to Take Off the system. If the Turbidity reaches 5 NTU or more:

- Notify the Manager of Public Works or his designated,
- Contact Vancouver Coastal Health Authority and possibly issue a BWA,
- Check and record the Chlorine Residual that is present at the same site as the turbidity sample was taken, and
- Check with other purveyors like the District of West Vancouver to see at what point high turbidity events correlate with positive water samples.

WATER LINE BREAKS

In the event of a water line break, where water pressure has maintained until the leak has been exposed so that there is no danger of any material flowing back into the break, there will be no need for any special condition to be applied. Flush the repair area with treated water before placing that area back in service.

In the event that the broken line is suspected of having a negative pressure:

- Notify the Manager of Public Works or his designated,
- Notify the Vancouver Coastal Health Authority for a possible BWA,
- Repair the break and flush the area with treated water, and
- Rescind the BWA if necessary.

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

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Appendix E

Sample Boil Water Advisory

THE MUNICIPALITY OF THE VILLAGE OF LIONS BAY

NOTICE TO RESIDENTS

of Lions Bay and Brunswick Beach

BOIL WATER ADVISORY

until further notice.

Due to high turbidity and low chlorine residual – we are issuing an immediate boil water advisory – We will keep you posted as to when this will be lifted –

Residents can disinfect their water by either:

1. Boiling the water for 2 minutes, or
2. Adding 4 drops of household bleach per gallon of water (.8 drops if water is cloudy), stirring and waiting for 20 minutes before consumption.

This includes water used for brushing teeth, cooking, washing dishes, and washing ready-to-eat fruit and vegetables.

Village of Lions Bay
October 26, 2010

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

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Appendix F

VCH Permits to Operate

Vancouver CoastalHealth
Promoting wellness. Ensuring care.

Vancouver Coastal Health

PERMIT
TO OPERATE

Drinking Water System 301-10,000 Connections

Facility Number: 3317552348

Name of Facility: Lions Bay Harvey Creek Water System

Address: Upper Oceanview Road
Lions Bay, BC

Owner: Municipality of The Village of Lions Bay

Conditions:

1. Submit weekly water samples for bacteriological testing at sites approved by VCH.
2. Chlorine residuals must be recorded daily at locations approved by VCH.
3. Biannual flushing on the entire distribution system.
4. Daily turbidity testing.
5. Annual chemical testing of source
6. Submit annual updated ERP to VCH.

September 29, 2010
Effective Date

Rod Schluter
Environmental Health Officer

This permit must be displayed in a conspicuous place and is nontransferable.

Place Decal Here

ENV20 - 08/03

Vancouver CoastalHealth
Promoting wellness. Ensuring care.

Vancouver Coastal Health

PERMIT
TO OPERATE

Drinking Water System 301-10,000 Connections

Facility Number: 3317552347

Name of Facility: Lions Bay Magnesia Creek Water System

Address: Upper Sunset Road
Lions Bay, BC

Owner: Municipality of The Village of Lions Bay

Conditions:

1. Submit weekly water samples for bacteriological testing at sites approved by VCH.
2. Chlorine residuals must be recorded daily at locations approved by VCH.
3. Biannual flushing on the entire distribution system.
4. Daily turbidity testing.
5. Annual chemical testing of source
6. Submit annual updated ERP to VCH.

September 29, 2010
Effective Date

Rod Schluter
Environmental Health Officer

This permit must be displayed in a conspicuous place and is nontransferable.

Place Decal Here

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Facility Classification

THIS IS TO CERTIFY THAT

Village of Lions Bay
Water System

has been classified by the Environmental Operators Certification Program in accordance with the guidelines established in co-operation with the Association of Boards of Certification (A.B.C.) as

Class II

Dated at Burnaby, B.C.on July 28, 2003

Secretary - Certification Board

Chairman - Certification Board

CERTIFICATE NO.675

eocp

MEMBER OF ASSOCIATION OF BOARDS OF CERTIFICATION
AFFILIATE OF B.C. WATER AND WASTE ASSOCIATION
A Society Incorporated under the Society Act, S.B.C. S-28724

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

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Appendix H

EOCP Operator Certificates

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Certificate of Qualification

This is to certify that:

Alberto Urrutia

By Examination Has Qualified As A

Water Distribution System Operator

and certifies that he/she has met the established qualifications and has the ability to efficiently operate and maintain a specified maximum size and type of water distribution system designated as follows:

Level II

Secretary - Certification Board

Chairman - Certification Board

July 12, 2006

Certificate No: 4766

eocp

Member of Association of Boards of Certification
Affiliate of B.C. Water and Waste Association

This certificate shall be in full force and effect when accompanied by an annual renewal seal

A Society Incorporated under the Society Act, S.B.C. S-28724

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Course Completion Certificate

This is to certify that

Alberto Urrutia

By Examination Has Qualified As A

Chlorine Handler

Secretary - Certification Board

Chairman - Certification Board

May 6, 2005

Certificate No. CH-4766

eocp