Drinking Water Quality Report - 2010 -

THE CORPORATION OF THE
CITY OF PITT MEADOWS

DRINKING WATER QUALITY REPORT 2010

Table of Contents

1.0 EXECUTIVE SUMMARY

The City of Pitt Meadows holds a permit to operate its water utility from the Fraser Health Authority (FHA). In 2010, the city was mainly supplied by the Coquitlam watershed and treated by Metro Vancouver.

The city's operations department takes weekly water samples from eight stations which are sent to the Metro Vancouver laboratory for testing. Guidelines are set by the provincial Drinking Water Protection Act.

Bacteriological guidelines were met in 2010.

Chemical and physical monitoring for the source water and Metro Vancouver transmission system are conducted by Metro Vancouver. The only parameter of the city's distribution that did not meet the guideline was temperature; the guideline was only exceeded during the summer months.

Average free chlorine residual levels were maintained above the guideline at 7 of the 8 stations.

2.0 INTRODUCTIONS

This is the City of Pitt Meadows (PM) annual Drinking Water Quality Report for 2010. It is prepared for the Fraser Health Authority (FHA) as well as for public information.

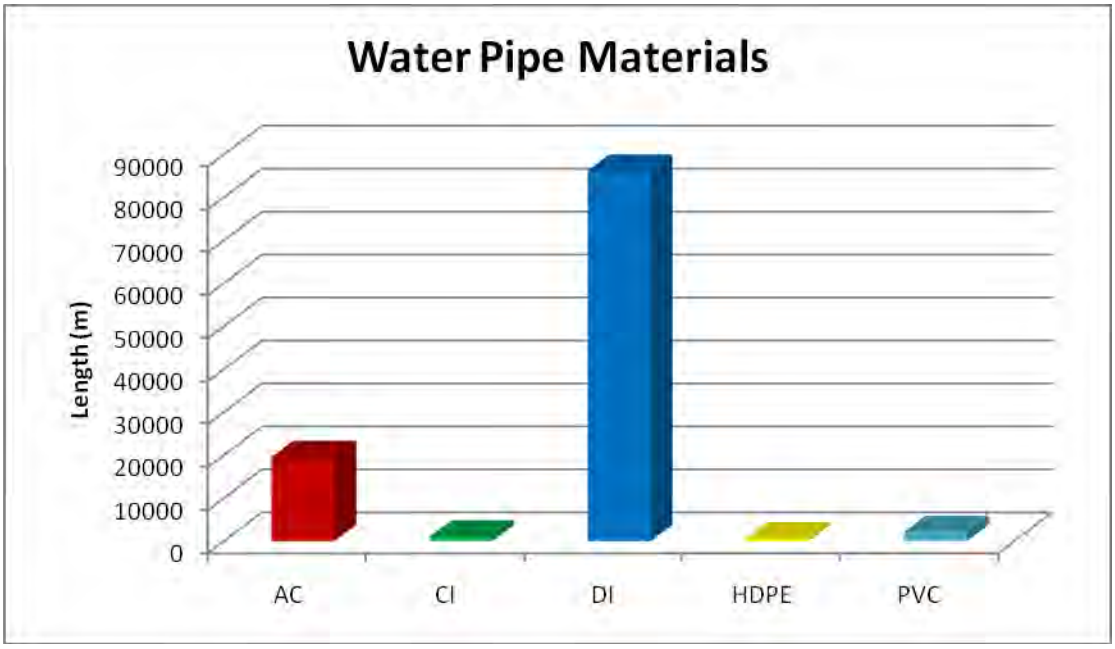
3.0 BACKGROUND

3.1 Regulating Authorities

PM holds a permit to operate its water distribution network from the FHA (Appendix 8) and adheres to the provisions of the Local Government Act. Water quality requirements are stipulated by the Drinking Water Protection Regulation (DWPR). The drinking water officer may also issue orders for non compliance and or health concerns.

3.2 Distribution System

PM's water distribution network is over 110 kilometers long and serves a population of approximately 17,500 residents.



Water Supply

The primary water supply source is the Coquitlam watershed. Water supply can also come from the Metro Vancouver's other watershed sources (Capilano & Seymour). The water arrives via Haney Mains 2 and 3. Water supplied by both Haney Main 2 and 3 is re-chlorinated at the Pitt River Secondary Disinfection Station prior to arriving in the municipal water distribution system. Water quality is anticipated to improve with the new UV disinfection plant in operation at Coquitlam Lake. A limited number of residents are served by a section of Haney Main 1 fed from Haney 2 east of Harris. This main will be

abandoned by early summer 2011 with the residents being connected to a new ductile iron main being installed by the City.

Maintenance

In a unidirectional fashion, using valve isolation, all water mains were effectively flushed. Dead end lines that are not looped received special attention. Sodium thiosulphate was used to ensure the absence of chlorine residual as the water being flushed was introduced into the environment. An automatic flush valve at the end of the long run on Rannie Road engages for 2 hours twice every day to ensure the presence of chlorine residual.

All City owned backflow devices and assemblies were tested and repaired as required by a certified tester.

All components of the six pressure regulating stations and the single booster station were maintained on a regular basis to ensure proper operation. This maintenance included the cleaning of inline and body strainers, function of Clayton valves, pressure relief valves, air valves and rebuilding the 2 pumps and motors at the booster station.

All 462 fire hydrants and 4 standpipes owned by the City were fully maintained in 2010. The hydrants received a scheduled "A" or "B" service and approximately 125 were power washed and painted.

The City has 928 mainline and service valves in the distribution system that were exercised and maintained as necessary.

Repairs and Upgrades

Currently asbestos cement (AC) mains are being replaced by ductile iron mains (DI) on a yearly basis with all AC mains scheduled to be replaced by 2025. Projects in 2010 included:

1) Replaced 813 meters of AC pipe on Wooldridge Rd with 250 mm DI;
2) Replaced 198 meters of AC pipe on 119B Ave with 150 mm DI pipe;
3) Replaced 221 meters of AC main on Blakely Rd with 200 mm DI pipe.

4.0 WATER QUALITY SAMPLE SITES

The city has 8 sampling sites that are sampled weekly. Their locations and attributes are listed in table 1 and shown on a map in Appendix 1. All 8 sample sites are tested for physical parameters and 4 are tested for chemical in one distribution zone.

Table 1: Sample Location and Attributes

Sample Site	Location	Main Size (mm)	Normal Flow
DmPMS-421	12192 McMyn Ave	150 AC	Low (Dead End)
DmPMS-422	19817 Wildwood Place	150 AC	Low
DmPMS-423	12476 Wooldridge Road	250 DI	Medium
DmPMS-424	20217 McNeil Road	250 DI	Medium
DmPMS-425	16651 Rannie Road	150 DI	Low (Dead End)
DmPMS-426	13657 McKechnie Road	150 AC	Medium
DmPMS-427	120B Ave Opposite 18993	150 AC	Low
DmPMS-428	100 meters west of Old Dewdney Trunk Rd PRV	300 DI	Source

Samples are taken every Tuesday morning by the city's Operations Department and are then picked up by the Metro Vancouver for testing. The 2010 results are in Appendix 2. As requested by the Ministry of Health in 2008, a new testing station was established in December 2008 at the Dewdney Trunk PRV station.

4.1 Bacteriological Monitoring

Samples are analyzed for fecal coliform, total coliform and heterotrophic plate count (HPC). BCSDWR Microbiological Standards are listed in Table 2.

Table 2: BCSDWR Microbiological Standards

Parameter	Occurrence	Standard
Fecal Coliform	0	Less than 1 fecal coliform per 100 mL
Total Coliform	0	0 total coliform per 100 mL At least 90% of samples have 0 total coliform per 100 mL and no sample has more than 10 fecal coliform per 100 mL

Bacteriological Results

Appendix 4 illustrates the bacteriological requirements were met in 2010.

4.2 Chemical and Physical Monitoring

Monitoring of the City's distribution system is conducted by the Metro Vancouver. Samples are screened for temperature, pH and turbidity. Monitoring of the source water and Metro Vancouver transmission system is conducted by the Metro Vancouver Water District (MVWD) and Metro Vancouver. Table 3 illustrates which BCSDWR guidelines were not met.

Table 3: Chemical or Physical Parameters that Did Not Meet the Guidelines

Parameter	Target	Number of Tests that did not meet the Guideline	Percent of Tests that did not meet the Guideline
Source Water			
See Appendix 3, 6 and 7			
Metro Vancouver Transmission System			
See Appendix 5			
City Distribution System			
Temperature	<15 °C	22	5.6%

Temperature of water was generally acceptable, the only times that the water temperature was above the guideline was during the summer months, particularly August and early September. All 22 failed tests did not exceed 15 °C

Temperature of water will affect the efficiency of water treatment processes. Low temperature decreases efficiency of treatment processes and high temperatures enhance the growth of nuisance organisms.

Total Haloacetic Acid results account for the by-products of the disinfection process from chlorine break down and are within the allowable limits. In comparison with previous years we see averages moving up and down across the municipality from station to station and year to year.

Source water and Metro Vancouver improvement plans are determined by the MVWD and published in the *MVWD Quality Control Annual Report, 2010*.

4.3 Chlorine Residual Levels

Table 4: Chlorine Levels at Each Sample Site in 2010

Sample Site	Number of Samples Taken	Number of Samples with <0.2ppm Chlorine Residual	Percent of Samples with <0.2ppm Chlorine Residual
DmPMS-421	49	0	0%
DmPMS-422	48	0	0%
DmPMS-423	49	3	6%
DmPMS-424	49	0	0%
DmPMS-425	49	35	71%
DmPMS-426	48	1	2%
DmPMS-427	48	0	0%
DmPMS-428	49	0	0%

Chlorine Residual Improvement Plan

Site 425 - Due to the low usage during the winter months at this northern location the City installed an auto flush valve in early 2010. This site has been experiencing low readings for the past 7 years. The situation with low chlorine residual is not improving even with the installation and modifications to the flush valve. Low residual may be attributed to a build up within the pipe that is not coming out with the current unidirectional flushing program. When the system is flushed with larger volumes of water than is provided by the flush valve the chlorine residual does improve for short periods of time. The City will be starting a more aggressive unidirectional flushing program by opening larger hydrant ports to improve free flow and scouring. If this is not successful we will be removing a section of the main to inspect the interior wall for abnormal build up and if necessary install launch tubes for the swabbing process.

Site 423 – Showing 2 rather low readings the week of Sept 21 -28/10. Construction for 1 week on Woolridge Bridge eliminated the looping capabilities of the system causing this problem.

Total Haloacetic Acid (HAA) Improvement Plan

Continue to monitor and review results. The test results show Total HAA being highest in the winter months and lowest in the summer months. Likely attributable to flow and water consumption and opposite of our regular flushing program. If the values continue to trend upwards we will increase our flushing program from annual to bi-annual until this situation corrects itself.

5.0 EMERGENCY RESPONSE PLAN

The City of Pitt Meadows Water Response Plan is a document that contains detailed information for all emergencies that may be encountered including major disasters such as earthquakes and flooding. The following provides a brief overview of the plan:

Contamination

1) Metro Vancouver notifies the City of Pitt Meadows Works Department of some form of contamination from municipal samples and or source samples.

2) The City will obtain the following information:
-location where samples were obtained;
-approximate boundaries of the affected area;
-severity and type of contamination.

3) The Works Department will initiate notifications including the Fraser Health Authority for the City of Pitt Meadows providing all available information. Evaluate with the FHA the need for a "boil water" notification.

4) Depending on the severity of the contamination:
-isolate and flush the affected area with clean water.
-make arrangements with the Metro Vancouver for the collection of repeat samples as necessary.
-conduct chlorine residual and bacteriological testing after the mains have been flushed.
-repeat the above until water supply meets normal testing levels.

5) If contamination is severe:
-the Operations Superintendent will notify the Mayor of Pitt Meadows.
-if determined that a "boil water" notification is to be issued, prepare a document with press release and provide to the Director of Operations and Development Services. Provide notification to all schools, heath care centers, and care homes.
-the City will receive notification from the laboratory with results of the repeat samples and results of the species identification.
-contact the FHA and provide results of the repeat samples and the species identification.

-if the responsibility of the City of Pitt Meadows, the Operations Superintendent, in consultation with FHA, will initiate decontamination procedure.
-monitor decontamination procedure.

6) If the contamination appears to be of a suspicious nature, the City's Operations Director will notify the RCMP.

Turbidity

1) If a warning is received from GVRD or if the City identifies turbid water through monitoring, isolate the service area until turbidity passes or try to supply the area from a different source.

2) If a warning is issued, determine anticipated duration of event from GVRD.

3) Determine if necessary to issue a notification. If not, go to item 5.

4) If a notification is to be issued it must come from the Director of Operations And Development Services in consultation with Fraser Health Authority on the notification notice with release information.

5) Flush the affected area with clean water.

6) Conduct chlorine residual and bacteriological testing after the mains have been flushed.

Loss of Water

1) MVWD notifies of a system failure and or loss of supply.

2) Operations to determine the location, extent of service disruption.

3) Establish EOC if extent is widespread and service to be disrupted for extended periods of time.

4) The Works Department will initiate notifications including the Fraser Health Authority for the City of Pitt Meadows providing all available information. Evaluate with the FHA the need for a "boil water" notification.

5) Public notice must be sent out it include all schools, long term care facilities providing information on the disruption of service.

6) Fire Dept to arrange for alternative sources of water for fire fighting.

7) Planning and Operation Sections to determine impact on the distribution system. Determine if alternate sources can supplement until service is restored.

8) Arrange for water trucks and stage in appropriate areas for public distribution.

9) Monitor conditions with GVRD and when service is restored, determine is a boil water notification is necessary.

6.0 WATER FLUSHING MESSAGE FROM FRASER HEALTH

A public health message from the Fraser Health Authority

"Water from taps that are not used for several hours is good for washing or watering plants but not for drinking or cooking, as it may contain elevated levels of lead or copper. Run the water for at least one minute, or until the water is cold before using it for drinking or cooking. For the same reason never use water from hot taps for drinking or cooking."

APPENDIX – 1

ACCEPTABLE CHLORINE LEVELS AND SAMPLE SITE LOCATIONS


Acceptable Chlorine Levels
City of Pitt Meadows
Water Sampling Stations
2010
90% - 100% of samples have an acceptable level of chlorine
50% - 90% of samples have an acceptable level of chlorine
fewer than 50% of samples have an acceptable level of chlorine
DmPMS-425
DmPMS-424
DmPMS-426
DmPMS-428
DmPMS-423
DmPMS-421
GVS-072
(Metro Vancouver)
DmPMS-427
DmPMS-422

APPENDIX – 2

WEEKLY SAMPLE METRO VANCOUVER LAB RESULTS
DMPMS 421 – 428

DMPMS 421 Results:

Sampled Date	Sample Type	Chlorine Free	Ecoli	HPC	Temperature	Total Coliform	Turbidity
05/01/2010 10:10	GRAB	0.29	<1	<2	6.0	<1	0.62
12/01/2010 10:25	GRAB	0.35	<1	<2	7.0	<1	0.56
19/01/2010 10:30	GRAB	0.57	<1	<2	7.0	<1	0.64
26/01/2010 10:05	GRAB	0.52	<1	2	7.0	<1	1.5
02/02/2010 10:55	GRAB	0.46	<1	<2	7.0	<1	0.43
09/02/2010 10:30	GRAB	0.47	<1	2	8.0	<1	0.41
16/02/2010 10:25	GRAB	0.45	<1	2	8.0	<1	0.46
23/02/2010 8:35	GRAB	0.33	<1	<2	8.0	<1	0.36
02/03/2010 8:30	GRAB	0.47	<1	<2	8.0	<1	0.38
09/03/2010 8:50	GRAB	0.60	<1	2	8.0	<1	0.38
16/03/2010 10:15	GRAB	0.54	<1	<2	8.0	<1	0.40
23/03/2010 8:20	GRAB	0.44	<1	<2	7.5	<1	0.40
30/03/2010 9:12	GRAB	0.73	<1	<2	8.0	<1	0.37
06/04/2010 10:25	GRAB	0.65	<1	<2	9.0	<1	0.45
13/04/2010 10:45	GRAB	0.52	<1	4	9.0	<1	0.37
20/04/2010 8:40	GRAB	0.45	<1	2	9.0	<1	0.30
27/04/2010 9:05	GRAB	0.52	<1	4	10	<1	0.32
04/05/2010 10:20	GRAB	0.62	<1	<2	10	<1	0.38
11/05/2010 11:05	GRAB	0.64	<1	<2	10	<1	0.29
18/05/2010 9:18	GRAB	0.67	<1	<2	10	<1	0.34
01/06/2010 9:00	GRAB	0.34	<1	<2	12	<1	0.31
08/06/2010 9:25	GRAB	0.36	<1	<2	12	<1	0.26
15/06/2010 10:50	GRAB	NA	<1	2	12	<1	0.29
22/06/2010 8:36	GRAB	0.56	<1	<2	11	<1	0.27
06/07/2010 10:40	GRAB	0.61	<1	2	12	<1	0.30
13/07/2010 8:32	GRAB	0.24	<1	4	13	<1	0.23
20/07/2010 10:35	GRAB	0.71	<1	2	12	<1	0.29
27/07/2010 8:23	GRAB	0.34	<1	2	14	<1	0.23
03/08/2010 10:45	GRAB	0.64	<1	<2	12	<1	0.20
10/08/2010 10:58	GRAB	0.64	<1	<2	13	<1	0.19
17/08/2010 11:15	GRAB	0.71	<1	<2	13	<1	0.22
24/08/2010 10:40	GRAB	0.68	<1	<2	14	<1	0.29
31/08/2010 11:00	GRAB	0.60	<1	2	14	<1	0.21
07/09/2010 9:00	GRAB	0.58	<1	<2	14	<1	0.19
14/09/2010 9:24	GRAB	0.62	<1	<2	14	<1	0.23
21/09/2010 9:15	GRAB	0.50	<1	<2	15	<1	0.20
28/09/2010 9:05	GRAB	0.33	<1	2	15	<1	0.25
05/10/2010 10:45	GRAB	0.49	<1	<2	14	<1	0.32
12/10/2010 10:40	GRAB	0.46	<1	<2	14	<1	0.31
19/10/2010 8:55	GRAB	0.55	<1	<2	14	<1	0.30
26/10/2010 10:40	GRAB	0.53	<1	<2	13	<1	0.41
02/11/2010 10:35	GRAB	0.48	<1	16	12	<1	0.34
09/11/2010 8:45	GRAB	0.33	<1	2	11	<1	0.39
16/11/2010 10:10	GRAB	0.67	<1	<2	11	<1	0.33

30/11/2010 10:40	GRAB	0.59	<1	2	8.0	<1	0.31
07/12/2010 9:20	GRAB	0.55	<1	<2	8.0	<1	0.25
14/12/2010 8:55	GRAB	0.76	<1	<2	8.0	<1	0.57
21/12/2010 10:15	GRAB	0.71	<1	<2	8.0	<1	0.45

DMPMS 422 Results:

Sampled Date	Sample Type	Chlorine Free	Ecoli	HPC	Temperature	Total Coliform	Turbidity
05/01/2010 10:25	GRAB	0.31	<1	<2	7.0	<1	0.63
12/01/2010 8:30	GRAB	0.46	<1	<2	7.0	<1	0.63
19/01/2010 8:35	GRAB	0.57	<1	<2	7.0	<1	0.67
26/01/2010 10:20	GRAB	0.55	<1	<2	7.0	<1	0.58
02/02/2010 9:00	GRAB	0.64	<1	2	7.0	<1	0.50
09/02/2010 8:25	GRAB	0.51	<1	<2	8.0	<1	0.44
16/02/2010 8:30	GRAB	0.43	<1	6	8.0	<1	0.46
23/02/2010 10:30	GRAB	0.53	<1	<2	8.0	<1	0.41
02/03/2010 10:50	GRAB	0.38	<1	<2	8.0	<1	0.40
09/03/2010 8:15	GRAB	0.57	<1	<2	8.0	<1	0.50
16/03/2010 10:35	GRAB	0.52	<1	<2	8.0	<1	0.40
23/03/2010 10:40	GRAB	0.59	<1	2	7.5	<1	0.38
30/03/2010 8:55	GRAB	0.53	<1		9.0	<1	0.39
06/04/2010 8:30	GRAB	0.63	<1	<2	9.0	<1	0.37
13/04/2010 8:40	GRAB	0.64	<1	<2	9.0	<1	0.48
20/04/2010 10:45	GRAB	0.60	<1	<2	8.5	<1	0.31
27/04/2010 8:30	GRAB	0.60	<1	<2	10	<1	0.27
04/05/2010 10:30	GRAB	0.60	<1	<2	10	<1	0.28
11/05/2010 11:20	GRAB	0.62	<1	2	10	<1	0.31
18/05/2010 8:55	GRAB	0.63	<1	2	10	<1	0.36
01/06/2010 8:30	GRAB	0.54	<1	<2	12	<1	0.29
08/06/2010 9:10	GRAB	0.44	<1	<2	12	<1	0.28
15/06/2010 8:35	GRAB	0.53	<1	<2	12	<1	0.30
22/06/2010 10:45	GRAB	0.56	<1	2	12	<1	0.30
06/07/2010 8:30	GRAB	0.63	<1	2	12	<1	0.30
13/07/2010 11:20	GRAB	0.73	<1	2	12	<1	0.24
20/07/2010 8:30	GRAB	0.73	<1	<2	12	<1	0.25
27/07/2010 11:10	GRAB	0.71	<1	<2	12	<1	0.36
03/08/2010 8:26	GRAB	0.65	<1	<2	13	<1	0.22
10/08/2010 8:25	GRAB	0.49	<1	<2	14	<1	0.21
17/08/2010 8:46	GRAB	0.73	<1	130	13	<1	0.18
24/08/2010 10:55	GRAB	0.64	<1	<2	14	<1	0.23
31/08/2010 8:35	GRAB	0.52	<1	<2	14	<1	0.19
07/09/2010 9:15	GRAB	0.55	<1	<2	14	<1	0.23
14/09/2010 9:00	GRAB	0.45	<1	<2	14	<1	0.19
21/09/2010 10:45	GRAB	0.79	<1	<2	15	<1	0.23
28/09/2010 10:40	GRAB	0.31	<1	<2	15	<1	0.24
05/10/2010 8:30	GRAB	0.54	<1	4	15	<1	0.31
12/10/2010 8:30	GRAB	0.52	<1	2	14	<1	0.28

19/10/2010 10:25	GRAB	0.46	<1	<2	14	<1	0.30
26/10/2010 10:10	GRAB	0.56	<1	<2	13	<1	0.41
02/11/2010 8:30	GRAB	0.42	<1	<2	12	<1	0.38
09/11/2010 8:30	GRAB	0.38	<1	<2	11	<1	0.34
16/11/2010 11:45	GRAB	0.73	<1	<2	11	<1	0.35
30/11/2010 8:30	GRAB	0.53	<1	4	8.0	<1	0.32
07/12/2010 10:55	GRAB	0.63	<1	14	8.0	<1	0.29
14/12/2010 9:10	GRAB	0.85	<1	<2	8.0	<1	0.64
21/12/2010 10:30	GRAB	0.67	<1	42	8.0	<1	0.40

DMPMS 423 Results:

Sampled Date	Sample Type	Chlorine Free	Ecoli	HPC	Temperature	Total Coliform	Turbidity
05/01/2010 8:35	GRAB	0.78	<1	<2	7.0	<1	0.65
12/01/2010 10:10	GRAB	0.59	<1	6	7.0	<1	0.59
19/01/2010 10:15	GRAB	0.60	<1	2	7.0	<1	0.63
26/01/2010 8:35	GRAB	0.87	<1	<2	7.0	<1	0.74
02/02/2010 10:45	GRAB	0.61	<1	2	7.0	<1	0.53
09/02/2010 10:15	GRAB	0.58	<1	2	8.0	<1	0.51
16/02/2010 10:10	GRAB	0.38	<1	14	8.0	<1	0.50
23/02/2010 8:55	GRAB	0.58	<1	<2	8.0	<1	0.44
02/03/2010 8:45	GRAB	0.44	<1	<2	8.0	<1	0.40
09/03/2010 9:10	GRAB	0.15	<1	<2	9.0	<1	0.39
16/03/2010 8:40	GRAB	0.49	<1	6	8.0	<1	0.38
23/03/2010 8:40	GRAB	0.83	<1	<2	7.0	<1	0.35
30/03/2010 9:40	GRAB	0.68	<1	<2	8.0	<1	0.37
06/04/2010 10:10	GRAB	0.75	<1	<2	8.0	<1	0.42
13/04/2010 10:35	GRAB	0.67	<1	<2	9.0	<1	0.39
20/04/2010 8:55	GRAB	0.55	<1	<2	8.5	<1	0.68
27/04/2010 9:20	GRAB	0.57	<1	<2	10	<1	0.52
04/05/2010 8:35	GRAB	0.73	<1	2	10	<1	0.30
11/05/2010 9:40	GRAB	0.65	<1	2	10	<1	0.31
18/05/2010 9:34	GRAB	0.65	<1	<2	10	<1	0.28
01/06/2010 9:15	GRAB	0.66	<1	<2	12	<1	0.38
08/06/2010 9:39	GRAB	0.57	<1	<2	11	<1	0.27
15/06/2010 10:40	GRAB	0.69	<1	<2	11	<1	0.31
22/06/2010 8:53	GRAB	0.69	<1	<2	12	<1	0.30
06/07/2010 10:25	GRAB	0.78	<1	2	12	<1	0.36
13/07/2010 9:15	GRAB	0.83	<1	<2	11	<1	0.22
20/07/2010 10:20	GRAB	0.84	<1	2	12	<1	0.28
27/07/2010 8:39	GRAB	0.76	<1	<2	12	<1	0.26
03/08/2010 10:27	GRAB	0.80	<1	<2	12	<1	0.21
10/08/2010 11:15	GRAB	0.87	<1	<2	12	<1	0.19
17/08/2010 11:32	GRAB	0.92	<1	<2	12	<1	0.20
24/08/2010 9:00	GRAB	0.85	<1	20	13	<1	0.20
31/08/2010 10:25	GRAB	0.83	<1	6	14	<1	0.23
07/09/2010 8:40	GRAB	0.61	<1	2	14	<1	0.18

14/09/2010 9:50	GRAB	0.65	<1	<2	14	<1	0.30
21/09/2010 8:45	GRAB	0.05	<1	18	15	<1	0.58
28/09/2010 8:45	GRAB	0.03	<1	170	15	<1	0.23
05/10/2010 10:30	GRAB	0.83	<1	26	14	<1	0.47
12/10/2010 10:20	GRAB	0.78	<1	10	14	<1	0.34
19/10/2010 8:40	GRAB	0.64	<1	14	14	<1	0.30
26/10/2010 10:25	GRAB	0.30	<1	<2	13	<1	0.43
02/11/2010 10:20	GRAB	0.48	<1	4	12	<1	0.38
09/11/2010 9:05	GRAB	0.63	<1	6	11	<1	0.38
16/11/2010 9:55	GRAB	0.64	<1	<2	11	<1	0.36
23/11/2010 9:10	GRAB	0.81	<1	2	9.0	<1	0.62
30/11/2010 10:25	GRAB	0.86	<1	<2	8.0	<1	0.32
07/12/2010 9:00	GRAB	0.72	<1	<2	8.0	<1	0.30
14/12/2010 8:40	GRAB	0.86	<1	6	8.0	<1	0.61
21/12/2010 10:00	GRAB	0.84	<1	<2	8.0	<1	0.50

DMPMS 424 Results:

Sampled Date	Sample Type	Chlorine Free	Ecoli	HPC	Temperature	Total Coliform	Turbidity
05/01/2010 9:30	GRAB	0.36	<1	<2	7.0	<1	2.5
12/01/2010 9:40	GRAB	0.53	<1	<2	7.0	<1	0.73
19/01/2010 9:40	GRAB	0.72	<1	<2	7.0	<1	0.86
26/01/2010 9:40	GRAB	0.61	<1	2	7.0	<1	0.54
02/02/2010 10:10	GRAB	0.70	<1	<2	7.0	<1	0.60
09/02/2010 9:40	GRAB	0.42	<1	2	8.0	<1	0.43
16/02/2010 9:40	GRAB	0.34	<1	<2	8.0	<1	0.46
23/02/2010 9:55	GRAB	0.50	<1	<2	8.0	<1	0.37
02/03/2010 10:10	GRAB	0.47	<1	<2	8.0	<1	2.0
09/03/2010 10:15	GRAB	0.67	<1	<2	8.0	<1	0.43
16/03/2010 9:30	GRAB	0.51	<1	<2	8.0	<1	0.39
23/03/2010 9:16	GRAB	0.65	<1	<2	7.0	<1	0.41
30/03/2010 10:18	GRAB	0.65	<1	<2	8.5	<1	0.36
06/04/2010 9:40	GRAB	0.49	<1	<2	8.0	<1	0.36
13/04/2010 10:00	GRAB	0.55	<1	<2	9.0	<1	0.34
20/04/2010 10:00	GRAB	0.51	<1	<2	8.5	<1	0.31
27/04/2010 9:50	GRAB	0.41	<1	<2	10	<1	0.29
04/05/2010 9:55	GRAB	0.60	<1	<2	11	<1	0.28
11/05/2010 10:35	GRAB	0.63	<1	16	10	<1	0.28
18/05/2010 10:20	GRAB	0.58	<1	2	10	<1	0.29
01/06/2010 10:05	GRAB	0.48	<1	2	11	<1	0.35
08/06/2010 10:15	GRAB	0.53	<1	<2	12	<1	0.46
15/06/2010 9:45	GRAB	0.60	<1	<2	12	<1	0.38
22/06/2010 9:55	GRAB	0.60	<1	<2	12	<1	0.26
06/07/2010 9:45	GRAB	0.74	<1	<2	12	<1	0.40
13/07/2010 10:49	GRAB	0.77	<1	4	12	<1	0.22
20/07/2010 9:45	GRAB	0.85	<1	<2	13	<1	0.30
27/07/2010 9:43	GRAB	0.87	<1	<2	12	<1	0.35

03/08/2010 9:42	GRAB	0.84	<1	<2	12	<1	0.19
10/08/2010 10:10	GRAB	0.62	<1	<2	13	<1	0.27
17/08/2010 10:00	GRAB	0.80	<1	<2	12	<1	0.29
24/08/2010 10:00	GRAB	0.74	<1	<2	14	<1	0.19
31/08/2010 9:40	GRAB	0.58	<1	<2	14	<1	0.20
07/09/2010 10:00	GRAB	0.63	<1	<2	14	<1	0.16
14/09/2010 10:44	GRAB	0.50	<1	<2	14	<1	0.17
21/09/2010 10:00	GRAB	0.74	<1	2	14	<1	0.19
28/09/2010 10:10	GRAB	0.67	<1	<2	14	<1	0.27
05/10/2010 9:35	GRAB	0.72	<1	<2	14	<1	0.30
12/10/2010 9:35	GRAB	0.56	<1	<2	14	<1	0.29
19/10/2010 10:05	GRAB	0.55	<1	<2	14	<1	0.39
26/10/2010 9:20	GRAB	0.49	<1	<2	13	<1	0.37
02/11/2010 9:20	GRAB	0.33	<1	<2	12	<1	0.33
09/11/2010 10:30	GRAB	0.40	<1	2	11	<1	0.29
16/11/2010 11:05	GRAB	0.77	<1	<2	11	<1	0.32
23/11/2010 10:10	GRAB	0.77	<1	<2	10	<1	0.36
30/11/2010 9:40	GRAB	0.65	<1	2	9.0	<1	0.23
07/12/2010 10:20	GRAB	0.48	<1	<2	8.0	<1	0.34
14/12/2010 10:00	GRAB	0.57	<1	2	8.0	<1	0.58
21/12/2010 9:10	GRAB	0.55	<1	<2	8.0	<1	0.43

DMPMS 425 Results:

Sampled Date	Sample Type	Chlorine Free	Ecoli	HPC	Temperature	Total Coliform	Turbidity
05/01/2010 9:15	GRAB	0.05	<1	20	7.0	<1	3.1
12/01/2010 9:25	GRAB	0.21	<1	<2	8.0	<1	0.71
19/01/2010 9:25	GRAB	0.16	<1	<2	8.0	<1	0.65
26/01/2010 9:25	GRAB	0.13	<1	<2	7.0	<1	0.53
02/02/2010 9:55	GRAB	0.17	<1	<2	8.0	<1	0.52
09/02/2010 9:20	GRAB	0.06	<1	<2	8.0	<1	0.36
16/02/2010 9:25	GRAB	0.13	<1	18	8.0	<1	0.40
23/02/2010 9:45	GRAB	0.06	<1	10	9.0	<1	0.40
02/03/2010 9:45	GRAB	0.06	<1	16	9.0	<1	3.5
09/03/2010 10:00	GRAB	0.40	<1	<2	8.0	<1	0.38
16/03/2010 9:40	GRAB	0.08	<1	6	9.0	<1	0.34
23/03/2010 10:00	GRAB	0.13	<1	<2	8.0	<1	0.35
30/03/2010 10:37	GRAB	0.14	<1	4	9.0	<1	0.43
06/04/2010 9:15	GRAB	0.09	<1	<2	10	<1	0.38
13/04/2010 9:45	GRAB	0.14	<1	<2	10	<1	0.36
20/04/2010 9:45	GRAB	0.06	<1	<2	9.0	<1	0.38
27/04/2010 10:05	GRAB	0.13	<1	<2	10	<1	0.38
04/05/2010 9:35	GRAB	0.12	<1	<2	11	<1	0.87
11/05/2010 10:25	GRAB	0.17	<1	4	11	<1	0.29
18/05/2010 10:42	GRAB	0.19	<1	2	11	<1	0.27
01/06/2010 9:55	GRAB	0.16	<1	<2	12	<1	0.26
08/06/2010 10:31	GRAB	0.11	<1	<2	12	<1	0.30

15/06/2010 9:30	GRAB	0.07	<1	<2	13	<1	0.41
22/06/2010 9:45	GRAB	0.11	<1	<2	12	<1	0.36
06/07/2010 9:30	GRAB	0.17	<1	<2	13	<1	0.47
13/07/2010 10:35	GRAB	0.20	<1	<2	13	<1	0.20
20/07/2010 9:25	GRAB	0.39	<1	<2	14	<1	0.29
27/07/2010 9:35	GRAB	0.40	<1	<2	12	<1	0.45
03/08/2010 9:29	GRAB	0.25	<1	<2	13	<1	0.17
10/08/2010 9:59	GRAB	0.16	<1	<2	14	<1	0.23
17/08/2010 9:42	GRAB	0.29	<1	<2	14	<1	0.18
24/08/2010 9:45	GRAB	0.15	<1	<2	15	<1	0.25
31/08/2010 9:20	GRAB	0.21	<1	2	15	<1	0.21
07/09/2010 9:45	GRAB	0.19	<1	6	15	<1	0.21
14/09/2010 11:06	GRAB	0.13	<1	<2	15	<1	0.33
21/09/2010 10:15	GRAB	0.21	<1	<2	15	<1	0.25
28/09/2010 9:55	GRAB	0.24	<1	<2	15	<1	0.28
05/10/2010 9:20	GRAB	0.28	<1	<2	15	<1	0.40
12/10/2010 9:20	GRAB	0.14	<1	<2	15	<1	0.33
19/10/2010 9:50	GRAB	0.22	<1	<2	14	<1	0.33
26/10/2010 9:35	GRAB	0.07	<1	<2	14	<1	0.39
02/11/2010 9:05	GRAB	0.14	<1	<2	13	<1	0.39
09/11/2010 10:15	GRAB	0.15	<1	2	12	<1	0.39
16/11/2010 10:50	GRAB	0.22	<1	<2	12	<1	0.32
23/11/2010 9:55	GRAB	0.40	<1	40	11	<1	0.33
30/11/2010 9:25	GRAB	0.17	<1	<2	10	<1	0.31
07/12/2010 10:05	GRAB	0.14	<1	<2	9.0	<1	0.23
14/12/2010 9:45	GRAB	0.15	<1	20	9.0	<1	0.57
21/12/2010 9:25	GRAB	0.24	<1	<2	9.0	<1	0.40

DMPMS 426 Results:

Sampled Date	Sample Type	Chlorine Free	Ecoli	HPC	Temperature	Total Coliform	Turbidity
05/01/2010 9:00	GRAB	0.39	<1	<2	7.0	<1	0.75
12/01/2010 9:00	GRAB	0.29	<1	<2	7.0	<1	0.65
19/01/2010 9:05	GRAB	0.52	<1	<2	7.0	<1	0.70
26/01/2010 9:05	GRAB	0.49	<1	2	7.0	<1	0.72
02/02/2010 9:40	GRAB	0.54	<1	16	8.0	<1	0.50
09/02/2010 8:55	GRAB	0.60	<1	<2	8.0	<1	0.46
16/02/2010 9:05	GRAB	0.35	<1	<2	7.0	<1	0.62
23/02/2010 9:25	GRAB	0.33	<1	<2	8.0	<1	0.42
02/03/2010 9:20	GRAB	0.44	<1	2	8.0	<1	0.47
09/03/2010 9:45	GRAB	0.35	<1	<2	8.0	<1	0.45
16/03/2010 9:15	GRAB	0.38	<1	4	8.0	<1	0.47
23/03/2010 9:40	GRAB	0.61	<1	<2	7.5	<1	0.41
30/03/2010 11:06	GRAB	0.63	<1	<2	8.5	<1	0.38
06/04/2010 9:00	GRAB	0.42	<1	<2	9.0	<1	0.47
13/04/2010 9:20	GRAB	0.47	<1	<2	9.0	<1	0.37
20/04/2010 9:25	GRAB	0.52	<1	4	9.0	<1	0.32

27/04/2010 10:25	GRAB	0.38	<1	<2	10	<1	0.42
04/05/2010 9:10	GRAB	0.32	<1	<2	11	<1	0.44
11/05/2010 10:05	GRAB	0.68	<1	2	10	<1	0.36
18/05/2010 11:10	GRAB	0.35	<1	44	10	<1	0.27
01/06/2010 9:40	GRAB	0.28	<1	<2	13	<1	0.31
08/06/2010 10:48	GRAB	0.39	<1	<2	12	<1	0.33
15/06/2010 9:10	GRAB	0.53	<1	2	12	<1	0.34
22/06/2010 9:24	GRAB	0.51	<1	<2	12	<1	0.29
06/07/2010 9:05	GRAB	0.68	<1	<2	12	<1	0.32
13/07/2010 10:15	GRAB	0.71	<1	2	12	<1	0.24
20/07/2010 9:05	GRAB	0.77	<1	8	12	<1	0.62
27/07/2010 9:15	GRAB	0.70	<1	<2	12	<1	0.28
03/08/2010 9:12	GRAB	0.76	<1	<2	12	<1	0.20
10/08/2010 9:41	GRAB	0.57	<1	<2	14	<1	0.20
17/08/2010 9:24	GRAB	0.53	<1	<2	14	<1	0.21
24/08/2010 9:30	GRAB	0.58	<1	<2	14	<1	0.24
31/08/2010 8:55	GRAB	0.46	<1	<2	14	<1	0.20
07/09/2010 9:30	GRAB	0.54	<1	<2	15	<1	0.26
14/09/2010 11:30	GRAB	0.26	<1	2	14	<1	0.37
21/09/2010 10:30	GRAB	0.19	<1	<2	15	<1	0.29
28/09/2010 9:35	GRAB	0.62	<1	<2	15	<1	0.29
05/10/2010 9:00	GRAB	0.61	<1	<2	14	<1	0.45
12/10/2010 9:05	GRAB	0.46	<1	<2	14	<1	0.41
19/10/2010 9:35	GRAB	0.52	<1	<2	14	<1	0.27
26/10/2010 9:50	GRAB	0.36	<1	<2	13	<1	0.41
02/11/2010 8:45	GRAB	0.29	<1	<2	13	<1	0.43
09/11/2010 9:50	GRAB	0.43	<1	<2	12	<1	0.39
16/11/2010 10:35	GRAB	0.87	<1	2	11	<1	0.30
30/11/2010 9:05	GRAB	0.46	<1	<2	8.0	<1	0.26
07/12/2010 9:45	GRAB	0.42	<1	16	8.0	<1	0.25
14/12/2010 9:25	GRAB	0.49	<1	LA	8.0	<1	0.50
21/12/2010 9:40	GRAB	0.55	<1	<2	8.0	<1	0.40

DMPMS 427 Results:

Sampled Date	Sample Type	Chlorine Free	Ecoli	HPC	Temperature	Total Coliform	Turbidity
05/01/2010 10:10	GRAB	0.29	<1	<2	6.0	<1	0.62
12/01/2010 10:25	GRAB	0.35	<1	<2	7.0	<1	0.56
19/01/2010 10:30	GRAB	0.57	<1	<2	7.0	<1	0.64
26/01/2010 10:05	GRAB	0.52	<1	2	7.0	<1	1.5
02/02/2010 10:55	GRAB	0.46	<1	<2	7.0	<1	0.43
09/02/2010 10:30	GRAB	0.47	<1	2	8.0	<1	0.41
16/02/2010 10:25	GRAB	0.45	<1	2	8.0	<1	0.46
23/02/2010 8:35	GRAB	0.33	<1	<2	8.0	<1	0.36
02/03/2010 8:30	GRAB	0.47	<1	<2	8.0	<1	0.38
09/03/2010 8:50	GRAB	0.60	<1	2	8.0	<1	0.38
16/03/2010 10:15	GRAB	0.54	<1	<2	8.0	<1	0.40

23/03/2010 8:20	GRAB	0.44	<1	<2	7.5	<1	0.40
30/03/2010 9:12	GRAB	0.73	<1	<2	8.0	<1	0.37
06/04/2010 10:25	GRAB	0.65	<1	<2	9.0	<1	0.45
13/04/2010 10:45	GRAB	0.52	<1	4	9.0	<1	0.37
20/04/2010 8:40	GRAB	0.45	<1	2	9.0	<1	0.30
27/04/2010 9:05	GRAB	0.52	<1	4	10	<1	0.32
04/05/2010 10:20	GRAB	0.62	<1	<2	10	<1	0.38
11/05/2010 11:05	GRAB	0.64	<1	<2	10	<1	0.29
18/05/2010 9:18	GRAB	0.67	<1	<2	10	<1	0.34
01/06/2010 9:00	GRAB	0.34	<1	<2	12	<1	0.31
08/06/2010 9:25	GRAB	0.36	<1	<2	12	<1	0.26
15/06/2010 10:50	GRAB	NA	<1	2	12	<1	0.29
22/06/2010 8:36	GRAB	0.56	<1	<2	11	<1	0.27
06/07/2010 10:40	GRAB	0.61	<1	2	12	<1	0.30
13/07/2010 8:32	GRAB	0.24	<1	4	13	<1	0.23
20/07/2010 10:35	GRAB	0.71	<1	2	12	<1	0.29
27/07/2010 8:23	GRAB	0.34	<1	2	14	<1	0.23
03/08/2010 10:45	GRAB	0.64	<1	<2	12	<1	0.20
10/08/2010 10:58	GRAB	0.64	<1	<2	13	<1	0.19
17/08/2010 11:15	GRAB	0.71	<1	<2	13	<1	0.22
24/08/2010 10:40	GRAB	0.68	<1	<2	14	<1	0.29
31/08/2010 11:00	GRAB	0.60	<1	2	14	<1	0.21
07/09/2010 9:00	GRAB	0.58	<1	<2	14	<1	0.19
14/09/2010 9:24	GRAB	0.62	<1	<2	14	<1	0.23
21/09/2010 9:15	GRAB	0.50	<1	<2	15	<1	0.20
28/09/2010 9:05	GRAB	0.33	<1	2	15	<1	0.25
05/10/2010 10:45	GRAB	0.49	<1	<2	14	<1	0.32
12/10/2010 10:40	GRAB	0.46	<1	<2	14	<1	0.31
19/10/2010 8:55	GRAB	0.55	<1	<2	14	<1	0.30
26/10/2010 10:40	GRAB	0.53	<1	<2	13	<1	0.41
02/11/2010 10:35	GRAB	0.48	<1	16	12	<1	0.34
09/11/2010 8:45	GRAB	0.33	<1	2	11	<1	0.39
16/11/2010 10:10	GRAB	0.67	<1	<2	11	<1	0.33
30/11/2010 10:40	GRAB	0.59	<1	2	8.0	<1	0.31
07/12/2010 9:20	GRAB	0.55	<1	<2	8.0	<1	0.25
14/12/2010 8:55	GRAB	0.76	<1	<2	8.0	<1	0.57
21/12/2010 10:15	GRAB	0.71	<1	<2	8.0	<1	0.45

DMPMS 428 Results:

Sampled Date	Sample Type	Chlorine Free	Ecoli	HPC	Temperature	Total Coliform	Turbidity
05/01/2010 8:45	GRAB	0.69	<1	<2	6.0	<1	0.77
12/01/2010 10:00	GRAB	1.1	<1	<2	5.0	<1	0.72
19/01/2010 9:55	GRAB	0.97	<1	<2	6.0	<1	0.81
26/01/2010 8:50	GRAB	1.0	<1	<2	6.0	<1	0.65
02/02/2010 10:30	GRAB	1.1	<1	<2	6.0	<1	0.51
09/02/2010 10:00	GRAB	0.91	<1	<2	7.0	<1	0.41

16/02/2010 9:55	GRAB	1.1	<1	<2	7.0	<1	0.53
23/02/2010 9:10	GRAB	0.99	<1	<2	7.0	<1	0.42
02/03/2010 8:55	GRAB	0.99	<1	<2	7.0	<1	0.45
09/03/2010 9:30	GRAB	0.81	<1	<2	7.0	<1	0.40
16/03/2010 8:55	GRAB	1.0	<1	<2	7.0	<1	0.45
23/03/2010 9:00	GRAB	1.0	<1	2	6.5	<1	0.39
30/03/2010 9:58	GRAB	1.2	<1	<2	7.0	<1	0.42
06/04/2010 9:55	GRAB	1.1	<1	<2	8.0	<1	0.46
13/04/2010 10:20	GRAB	0.79	<1	<2	8.0	<1	0.38
20/04/2010 9:10	GRAB	0.68	<1	<2	7.5	<1	0.29
27/04/2010 9:30	GRAB	0.78	<1	<2	9.0	<1	0.27
04/05/2010 8:50	GRAB	0.72	<1	<2	9.0	<1	0.31
11/05/2010 9:55	GRAB	0.74	<1	<2	9.0	<1	0.34
18/05/2010 9:53	GRAB	0.75	<1	<2	9.0	<1	0.31
01/06/2010 9:25	GRAB	0.77	<1	<2	10	<1	0.30
08/06/2010 9:53	GRAB	0.66	<1	<2	10	<1	0.29
15/06/2010 10:00	GRAB	0.70	<1	<2	10	<1	0.35
22/06/2010 9:06	GRAB	0.77	<1	<2	10	<1	0.33
06/07/2010 10:05	GRAB	0.89	<1	<2	11	<1	0.46
13/07/2010 9:31	GRAB	1.1	<1	<2	10	<1	0.26
20/07/2010 10:05	GRAB	0.99	<1	<2	12	<1	0.28
27/07/2010 8:53	GRAB	1.0	<1	28	11	<1	0.28
03/08/2010 9:58	GRAB	0.99	<1	<2	12	<1	0.23
10/08/2010 10:30	GRAB	0.96	<1	<2	12	<1	0.27
17/08/2010 10:30	GRAB	1.1	<1	<2	12	<1	0.20
24/08/2010 9:15	GRAB	1.2	<1	<2	12	<1	0.26
31/08/2010 10:00	GRAB	0.93	<1	<2	13	<1	0.24
07/09/2010 10:15	GRAB	1.0	<1	<2	13	<1	0.28
14/09/2010 10:25	GRAB	1.1	<1	<2	13	<1	0.30
21/09/2010 9:45	GRAB	0.88	<1	<2	12	<1	0.25
28/09/2010 10:25	GRAB	1.1	<1	6	13	<1	0.29
05/10/2010 9:50	GRAB	1.1	<1	<2	14	<1	0.38
12/10/2010 9:50	GRAB	0.92	<1	<2	14	<1	0.35
19/10/2010 9:20	GRAB	0.89	<1	<2	13	<1	0.34
26/10/2010 9:00	GRAB	0.99	<1	<2	13	<1	0.49
02/11/2010 9:40	GRAB	1.1	<1	<2	9.0	<1	0.38
09/11/2010 9:40	GRAB	0.96	<1	<2	10	<1	0.44
16/11/2010 10:25	GRAB	1.2	<1	<2	10	<1	0.43
23/11/2010 10:25	GRAB	0.97	<1	<2	8.0	<1	0.45
30/11/2010 10:05	GRAB	0.92	<1	6	7.0	<1	0.33
07/12/2010 10:40	GRAB	0.95	<1	2	7.0	<1	0.31
14/12/2010 10:15	GRAB	1.0	<1	<2	7.0	<1	0.59
21/12/2010 8:55	GRAB	0.89	<1	<2	7.0	<1	0.47

APPENDIX – 3

QUARTERYLY METALS ANALYSIS RESULTS FROM METRO VANCOUVER LAB

Chemical Analysis

Sample	Date Sampled	THM (ppb)							HAA (ppb)						
		Bromodichloromethane	Bromoform	Chlorodibromomethane	Chloroform	Total Trihalomethanes	Total THM Quarterly Average		Dibromoacetic Acid	Dichloroacetic Acid	Monobromoacetic Acid	Monochloroacetic Acid	Trichloroacetic Acid	Total Haloacetic Acid	Total HAA Quarterly Average
PMS-422	26/05/2009 10:30	<1	<1	<1	31	31			<0.5	10	<1	4	14	28	
PMS-422	18/08/2009 13:00	<1	<1	<1	25	25			<0.5	18	<1	6	19	43	
PMS-422	24/11/2009 8:30	<1	<1	<1	38	38			<0.5	25	<1	5	17	47	
PMS-422	19/01/2010 8:35	<1	<1	<1	32	32	**32**		<0.5	30	<1	6	22.9	59	**44**
PMS-422	18/05/2010 9:05	<1	<1	<1	33	33	**32**		<0.5	16	<1	<2	19	35	**46**
PMS-422	14/09/2010 9:10	<1	<1	<1	29	29	**33**		<0.5	16	<1	5	18	39	**45**
PMS-422	30/11/2010 8:30	<1	<1	<1	31	31	**31**		<0.5	18	<1	6	34	58	**48**
PMS-424	26/05/2009 9:25	<1	<1	<1	21	21			<0.5	16	<1	5	14	35	
PMS-424	18/08/2009 13:40	<1	<1	<1	25	25			<0.5	17	<1	6	12	35	
PMS-424	24/11/2009 9:30	<1	<1	<1	41	41			<0.5	35	<1	8	28.7	72	
PMS-424	19/01/2010 9:45	<1	<1	<1	32	32	**30**		<0.5	34	<1	6	28.1	69	**53**
PMS-424	18/05/2010 10:29	<1	<1	<1	35	35	**33**		<0.5	13	<1	3	15	31	**52**
PMS-424	14/09/2010 10:49	<1	<1	<1	36	36	**36**		<0.5	20	<1	4	20	44	**54**
PMS-424	23/11/2010 10:30	<1	<1	<1	39	39	**36**		<0.5	20	<1	10	23	54	**50**
PMS-425	26/05/2009 9:10	<1	<1	<1	24	24			<0.5	7	<1	9	18	34	
PMS-425	18/08/2009 13:25	<1	<1	<1	28	28			<0.5	7	<1	4	21	32	
PMS-425	24/11/2009 9:20	<1	<1	<1	46	46			<0.5	18	<1	8	26.4	53	
PMS-425	19/01/2010 9:25	<1	<1	<1	35	35	**33**		<0.5	15	<1	7	21.6	43	**41**
PMS-425	18/05/2010 10:49	<1	<1	<1	39	39	**37**		<0.5	8	<1	<2	25	33	**40**
PMS-425	14/09/2010 11:15	1	<1	<1	40	41	**40**		<0.5	5	<1	<2	35	40	**42**
PMS-425	23/11/2010 10:35	1	<1	<1	44	45	**40**		<0.5	7	<1	3	19	28	**36**

Metal Analysis

Sample Name	Sample Reported Name	Date Sampled	Aluminum Total mg/L	Arsenic Total mg/L	Barium Total mg/L	Boron Total mg/L	Cadmium Total mg/L	Calcium Total mg/L	Chromium Total mg/L	Cobalt Total mg/L	Copper Total mg/L	Iron Total mg/L
PMS-421	19192 McMynn Ave.	08/06/2010	0.1	<0.01	0	<0.02	<0.0005	1.07	<0.001	<0.001	0.005	0.05
PMS-421	19192 McMynn Ave.	16/11/2010	0.1	<0.01	0	<0.02	<0.0005	1.06	<0.001	<0.001	0.006	0.06
PMS-426	McKechnie Road	08/06/2010	0.1	<0.01	0	<0.02	<0.0005	1.4	<0.001	<0.001	0.004	0.05
PMS-426	McKechnie Road	16/11/2010	0.1	<0.01	0	<0.02	<0.0005	1.09	<0.001	<0.001	0.004	0.06

Sample Name	Sample Reported Name	Date Sampled	Lead Total mg/L	Magnesium Total mg/L	Manganese Total mg/L	Molybdenum Total mg/L	Nickel Total mg/L	Selenium Total mg/L	Silver Total mg/L	Sodium Total mg/L	Zinc Total mg/L
PMS-421	19192 McMynn Ave.	08/06/2010	<0.001	0.1	0.01	<0.002	<0.001	<0.01	<0.001	6.5	0.003
PMS-421	19192 McMynn Ave.	16/11/2010	<0.001	0.1	0	<0.002	<0.001	<0.01	<0.001	7.6	0.003
PMS-426	McKechnie Road	08/06/2010	<0.001	0.08	0	<0.002	<0.001	<0.01	<0.001	6.5	0.003
PMS-426	McKechnie Road	16/11/2010	<0.001	0.08	0	<0.002	<0.001	<0.01	<0.001	7.4	<0.002

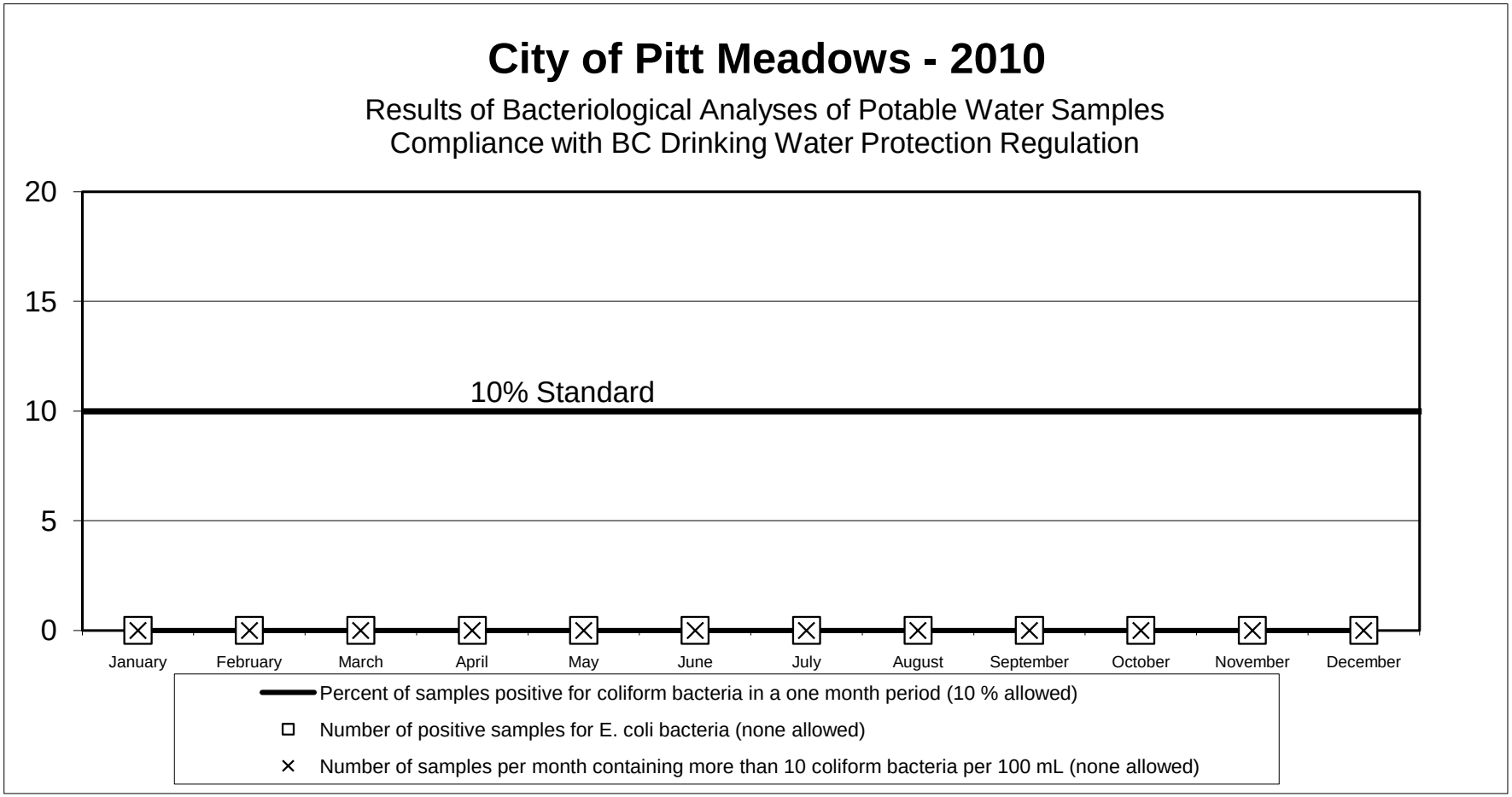
Vinyl Chloride Analysis

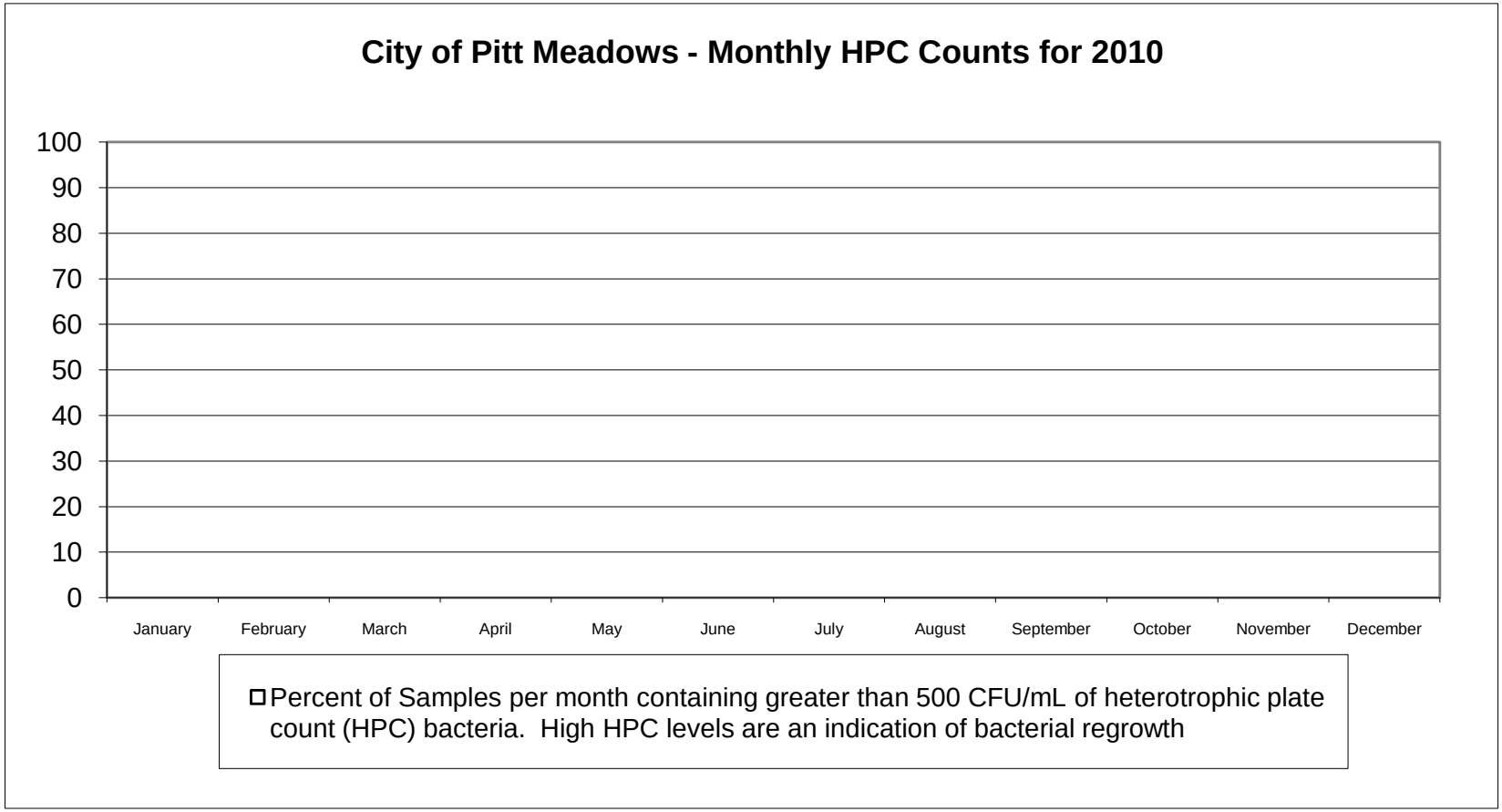
Municipality	Sample Site	1st half of 2010 Date Sampled	Vinyl Chloride µg/L	2nd half of 2010 Date Sampled	Vinyl Chloride µg/L
Pitt Meadows	1	08-Jun-10	<0.5	7-Dec-10	<0.5

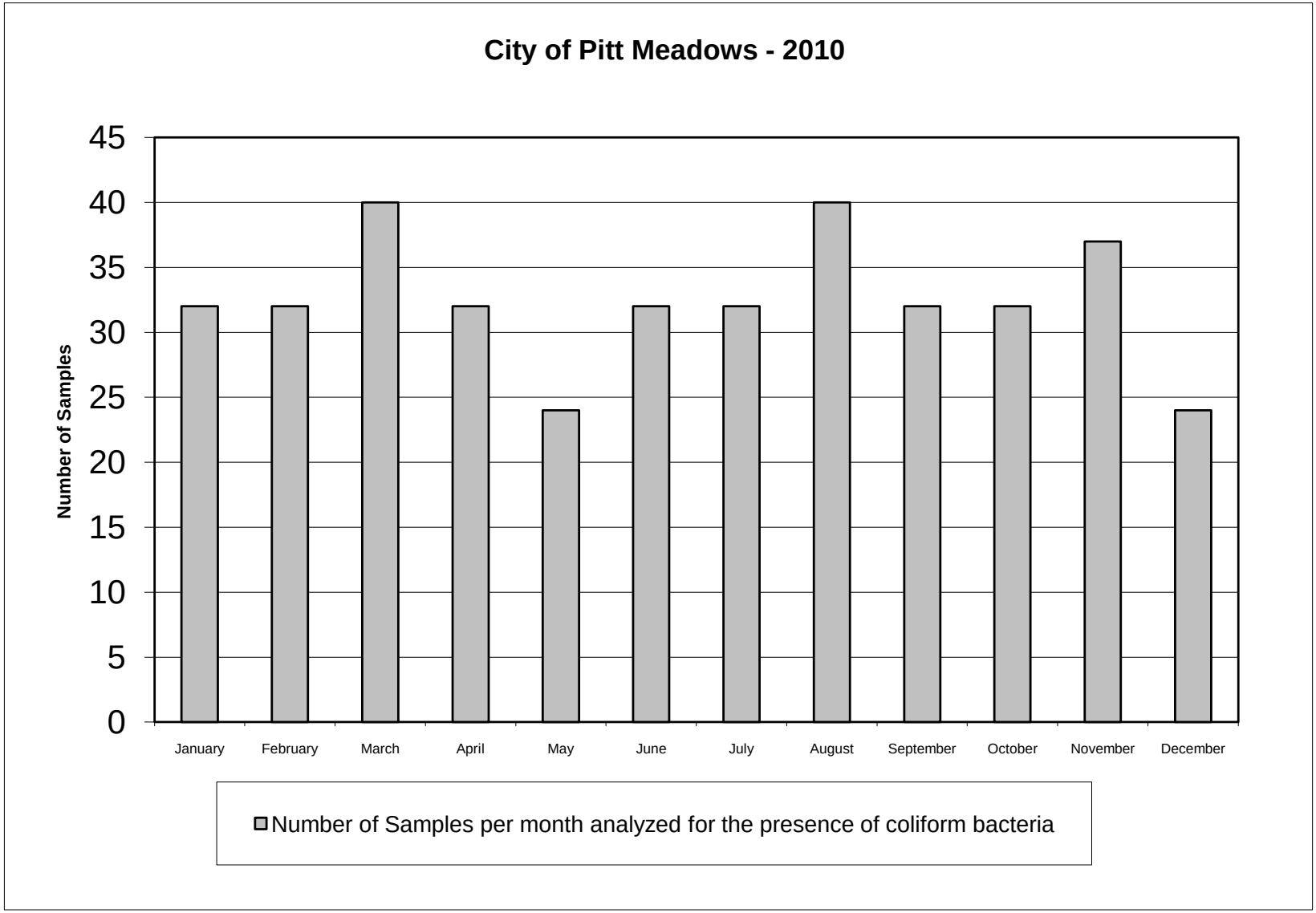
Analysis for Vinyl Chloride was not done by Metro Vancouver Laboratory but by Maxxam Analyticals Inc.

APPENDIX – 4

BACTERIOLOGICAL ANALYSIS OF POTABLE WATER SAMPLES


City of Pitt Meadows - 2010
Results of Bacteriological Analyses of Potable Water Samples
Compliance with BC Drinking Water Protection Regulation
20
15
10
5
0
10% Standard
January
February
March
April
May
June
July
August
September
October
November
December
Percent of samples positive for coliform bacteria in a one month period (10 % allowed)
Number of positive samples for E. coli bacteria (none allowed)
Number of samples per month containing more than 10 coliform bacteria per 100 mL (none allowed)


City of Pitt Meadows - Monthly HPC Counts for 2010
100
90
80
70
60
50
40
30
20
10
0
January
February
March
April
May
June
July
August
September
October
November
December
Percent of Samples per month containing greater than 500 CFU/mL of heterotrophic plate count (HPC) bacteria. High HPC levels are an indication of bacterial regrowth


City of Pitt Meadows - 2010
Number of Samples
45
40
35
30
25
20
15
10
5
0
January
February
March
April
May
June
July
August
September
October
November
December
Number of Samples per month analyzed for the presence of coliform bacteria

APPENDIX – 5

WEEKLY SAMPLE RESULTS – METRO VANCOUVER SAMPLE STATION GVS-072 IN MAPLE RIDGE AND STATION GVS-012 IN PORT MOODY

GVS-012 Port Moody Results:

Sampled date	Chlorine Free mg/L	Turbidity NTU	Temperature °C	Total Coliform MF/100mLs	Ecoli MF/100mLs	HPC CFU/mls
06/01/2010 11:24	0.89	1		<1	<1	2
15/01/2010 12:06	0.85	0.67		<1	<1	<2
21/01/2010 6:44	0.89	0.66		<1	<1	8
28/01/2010 8:38	0.79	0.66		<1	<1	<2
03/02/2010 10:37	0.84	0.64	5.8	<1	<1	<2
10/02/2010 8:46	0.89	0.45		<1	<1	<2
17/02/2010 8:16	0.81	0.47		<1	<1	2
19/02/2010 10:55	0.66	0.45		<1	<1	<2
23/02/2010 11:36	0.89	0.47		<1	<1	<2
03/03/2010 10:24	0.93	0.4		<1	<1	<2
09/03/2010 11:37	0.79	0.42		<1	<1	<2
11/03/2010 11:38	0.95	0.41		<1	<1	4
16/03/2010 13:20	0.92	0.93		<1	<1	<2
19/03/2010 10:38	0.94	0.48		<1	<1	<2
24/03/2010 7:09	0.88	0.39		<1	<1	<2
26/03/2010 9:13	0.76	0.45		<1	<1	<2
30/03/2010 10:27	0.78	0.45		<1	<1	<2
01/04/2010 8:31	0.78	0.56		<1	<1	<2
07/04/2010 10:25	0.89	0.48		<1	<1	<2
14/04/2010 8:37	0.69	0.81		<1	<1	<2
16/04/2010	0.59	0.53		<1	<1	2

7:17						
20/04/2010 9:00	0.97	0.51		<1	<1	<2
23/04/2010 11:55	1	0.38		<1	<1	<2
30/04/2010 6:39	0.74	0.34	7.6	<1	<1	<2
06/05/2010 12:18	0.8	0.35		<1	<1	<2
14/05/2010 10:04	0.69	0.33		<1	<1	<2
20/05/2010 11:47	0.91	0.46		<1	<1	2
25/05/2010 12:07	0.86	0.45		<1	<1	LA
02/06/2010 11:48	0.68	0.43		<1	<1	<2
10/06/2010 9:15	0.89	0.32		<1	<1	<2
16/06/2010 12:00	0.81	0.38		<1	<1	<2
22/06/2010 10:05	0.77	0.32		<1	<1	<2
23/06/2010 11:18	0.91	0.35		<1	<1	<2
30/06/2010 10:49	0.76	0.3		<1	<1	<2
07/07/2010 10:09	0.84	0.32		<1	<1	2
16/07/2010 8:19	0.86	0.29		<1	<1	20
21/07/2010 7:26	0.94	0.29		<1	<1	<2
23/07/2010 7:16	0.88	0.31		<1	<1	<2
28/07/2010 6:32	1	0.25		<1	<1	<2
29/07/2010 9:21	1	0.31		<1	<1	<2
05/08/2010 9:19	1	0.26		<1	<1	2
12/08/2010 10:58	0.66	0.21		<1	<1	<2
17/08/2010 10:58	1.1	0.23		<1	<1	<2
20/08/2010 7:33	1.1	0.3		<1	<1	<2

26/08/2010 10:55	1	0.22		<1	<1	6
01/09/2010 8:47	0.69	0.3		<1	<1	4
05/09/2010 11:14	0.92	0.29		<1	<1	150
14/09/2010 6:51	0.92	0.37		<1	<1	4
21/09/2010 12:08	0.71	0.29		<1	<1	<2
29/09/2010 7:30	0.87	0.42		<1	<1	12
05/10/2010 8:51	0.38	1.7		<1	<1	2
08/10/2010 12:15	1	0.3		<1	<1	<2
12/10/2010 10:43	1	0.39		<1	<1	<2
18/10/2010 14:13	1.3	0.41		<1	<1	<2
20/10/2010 11:55	1.1	0.39		<1	<1	<2
26/10/2010 8:48	1.3	0.46		<1	<1	<2
28/10/2010 11:53	0.51	0.45		<1	<1	<2
03/11/2010 9:07	0.81	0.5		<1	<1	<2
09/11/2010 8:53	1	0.37		<1	<1	2
10/11/2010 7:24	1.1	0.34		<1	<1	<2
16/11/2010 10:42	0.83	0.38		<1	<1	<2
19/11/2010 10:54	0.52	0.38		<1	<1	<2
25/11/2010 10:46	1	0.46		<1	<1	<2
30/11/2010 9:00	1.1	0.35	6.9	<1	<1	2
01/12/2010 7:39	0.61	0.46		<1	<1	<2
02/12/2010 10:27	1	0.37		<1	<1	<2
07/12/2010 8:03	0.81	0.29		7	<1	8
08/12/2010	0.8	0.3		<1	<1	<2

7:25						
09/12/2010 7:05	0.9	0.79		<1	<1	<2
10/12/2010 12:06	0.75	0.67		<1	<1	<2
15/12/2010 10:40	1.2	0.63		<1	<1	<2
17/12/2010 9:47	0.81	0.65		<1	<1	<2
22/12/2010 7:36	0.73	0.39		<1	<1	<2
31/12/2010 9:20	0.71	0.35		<1	<1	NA

GVS-072 Maple Ridge Results:

Sampled date	Chlorine Free mg/L	Turbidity NTU	Temperature °C	Total Coliform MF/100mLs	Ecoli MF/100mLs	HPC CFU/mls
05/01/2010 8:06	0.63	0.68		<1	<1	22
06/01/2010 6:52	0.73	0.77		<1	<1	<2
07/01/2010 10:20	0.82	0.76		<1	<1	<2
11/01/2010 7:43	0.75	0.8		<1	<1	56
13/01/2010 6:48	0.69	0.58		<1	<1	<2
18/01/2010 11:45	0.9	0.83		<1	<1	<2
26/01/2010 6:43	0.89	0.53		<1	<1	<2
02/02/2010 7:28	0.68	0.62		<1	<1	14
03/02/2010 6:47	0.59	0.45		<1	<1	<2
08/02/2010 10:52	0.74	0.51		<1	<1	2
09/02/2010 6:39	0.4	0.44		<1	<1	<2
11/02/2010 6:42	0.67	0.45		<1	<1	<2
16/02/2010 12:56	0.87	0.61		<1	<1	<2
17/02/2010	0.5	0.47		<1	<1	<2

7:40						
23/02/2010 11:55	0.99	0.48		<1	<1	<2
24/02/2010 7:30	0.66	0.43		<1	<1	<2
25/02/2010 7:28	0.83	0.42		<1	<1	<2
02/03/2010 12:02	0.78	0.44		<1	<1	<2
05/03/2010 7:08	0.74	0.38		<1	<1	<2
09/03/2010 11:04	<0.01	0.37		<1	<1	<2
10/03/2010 6:47	0.83	0.4		<1	<1	2
12/03/2010 6:45	0.82	0.5		<1	<1	<2
14/03/2010 7:07	1	0.54		<1	<1	<2
15/03/2010 6:33	0.87	0.54		<1	<1	<2
17/03/2010 6:50	0.87	0.53		<1	<1	4
22/03/2010 6:36	1.2	0.53		<1	<1	<2
24/03/2010 6:39	0.95	0.46		<1	<1	<2
26/03/2010 6:51	0.97	0.42		<1	<1	6
30/03/2010 6:46	0.88	0.49		<1	<1	<2
01/04/2010 6:23	0.53	0.43		<1	<1	<2
08/04/2010 8:46	0.99	0.44		<1	<1	<2
13/04/2010 10:05	0.69	0.48		<1	<1	14
14/04/2010 7:47	0.53	0.33		<1	<1	<2
15/04/2010 7:58	0.75	0.46		<1	<1	<2
16/04/2010 6:43	0.58	0.44		<1	<1	<2
20/04/2010 6:43	0.61	0.42		<1	<1	<2
21/04/2010 6:37	1	0.42		6	<1	<2

22/04/2010 12:33	0.7	0.39		4	<1	66
23/04/2010 6:38	1	0.35		<1	<1	<2
24/04/2010 8:07	0.9	0.34		<1	<1	2
26/04/2010 6:32	0.81	0.38		<1	<1	<2
27/04/2010 6:33	0.82	0.33		<1	<1	<2
28/04/2010 6:41	1	0.34		<1	<1	2
29/04/2010 7:40	0.77	0.29		<1	<1	<2
03/05/2010 6:43	0.66	0.34		<1	<1	<2
14/05/2010 7:33	0.61	0.36		<1	<1	<2
18/05/2010 6:23	0.71	0.35		<1	<1	<2
19/05/2010 11:17	0.75	0.41		<1	<1	<2
20/05/2010 7:20	0.67	0.55		<1	<1	<2
25/05/2010 13:06	0.96	0.58		<1	<1	<2
28/05/2010 6:37	0.66	0.4		<1	<1	<2
01/06/2010 6:33	0.89	0.34		<1	<1	<2
02/06/2010 12:50	1	0.39		<1	<1	2
03/06/2010 7:29	0.95	0.45		<1	<1	2
08/06/2010 9:12	0.92	0.36		<1	<1	<2
10/06/2010 7:26	0.76	0.37		<1	<1	<2
15/06/2010 6:42	0.88	0.34		<1	<1	2
17/06/2010 7:22	0.64	0.37		<1	<1	2
25/06/2010 7:02	0.86	0.31		<1	<1	<2
02/07/2010 8:40	0.45	0.33		<1	<1	<2
08/07/2010	0.95	0.39		<1	<1	4

7:39						
14/07/2010 9:28	0.98	0.33		<1	<1	<2
15/07/2010 7:56	0.6	0.42		<1	<1	2
20/07/2010 7:24	0.7	0.29		<1	<1	2
21/07/2010 6:39	0.61	0.34		<1	<1	6
23/07/2010 6:47	0.69	0.34		<1	<1	<2
26/07/2010 6:19	0.6	0.34		<1	<1	10
28/07/2010 9:29	0.74	0.3		<1	<1	<2
29/07/2010 8:06	0.74	0.3		<1	<1	2
04/08/2010 7:45	0.84	0.23		<1	<1	40
09/08/2010 12:12	0.67	0.28		<1	<1	10
11/08/2010 11:38	0.61	0.26		<1	<1	28
18/08/2010 6:46	0.78	0.23		<1	<1	<2
23/08/2010 6:52	0.66	0.25		<1	<1	<2
27/08/2010 7:42	0.88	0.25		<1	<1	<2
30/08/2010 6:47	0.44	0.3		<1	<1	<2
01/09/2010 7:28	0.59	0.28		<1	<1	44
09/09/2010 9:35	1.1	0.25		<1	<1	<2
15/09/2010 6:52	0.74	0.3		<1	<1	180
21/09/2010 6:45	1.1	0.34		<1	<1	<2
23/09/2010 7:52	0.98	0.27		<1	<1	<2
27/09/2010 6:41	0.68	0.41		<1	<1	20
06/10/2010 7:35	0.71	0.31		<1	<1	<2
07/10/2010 7:50	0.47	0.37		<1	<1	<2

13/10/2010 8:59	0.83	0.36		<1	<1	<2
21/10/2010 8:00	1	0.42		<1	<1	<2
26/10/2010 6:29	0.87	0.53		<1	<1	<2
02/11/2010 6:47	0.7	0.4		<1	<1	<2
04/11/2010 7:44	0.71	0.36		<1	<1	<2
08/11/2010 6:47	0.6	0.38		<1	<1	<2
17/11/2010 10:46	0.77	0.39		<1	<1	<2
23/11/2010 7:42	0.4	0.33		<1	<1	<2
26/11/2010 6:55	0.63	0.32		<1	<1	<2
29/11/2010 7:24	0.58	0.34		<1	<1	<2
30/11/2010 6:32	0.53	0.28		<1	<1	<2
06/12/2010 6:44	0.56	0.33		<1	<1	<2
08/12/2010 6:46	0.61	0.29		<1	<1	<2
13/12/2010 7:26	0.78	0.89		<1	<1	<2
16/12/2010 7:45	0.61	0.6		<1	<1	<2
21/12/2010 6:41	0.57	0.47		<1	<1	<2
30/12/2010 9:55	0.63	0.42		<1	<1	NA

APPENDIX – 6

SOURCE WATER QUALITY – COQUITLAM, SEYMOUR AND CAPILANO WATERSHEDS

Physical and Chemical Analysis of Water Supply

Greater Vancouver Water District

2010 - Coquitlam Water System

Parameter	Untreated	Treated			Canadian Guideline Limit	Reason Guideline Established
	Average	Average	Range	Days Guideline Exceeded		
Alkalinity as $CaCO_3$ (mg/L)	1.7	11.4	9.3-13.2		none	
Aluminum Dissolved (mg/L)	0.06	0.06	0.05-0.07		none	
Aluminum Total (mg/L)	0.06	0.04	0.05-0.07		none	
Antimony Total (mg/L)	<0.002	<0.002	<0.002	0	0.006	health
Arsenic Total (mg/L)	<0.001	<0.001	<0.001	0	0.010	health
Barium Total (mg/L)	0.002	0.002	0.002	0	1.0	health
Boron Total (mg/L)	<0.02	<0.02	<0.02	0	5.0	health
Bromate (mg/L)		<0.01	<0.01	0	0.01	health
Bromide (mg/L)	<0.01	<0.01	<0.01		none	
Cadmium Total (mg/L)	<0.00005	<0.00005	<0.00005	0	0.005	health
Calcium Total (mg/L)	0.90	0.90	0.84-0.96		none	
Carbon Organic Dissolved (mg/L)	1.3	1.5	1.3-1.9		none	
Carbon Organic Total (mg/L)	1.57	1.52	1.28-1.84		none	
Chlorate (mg/L)		<0.01	<0.01	0	1.0	health
Chloride Total (mg/L)	0.3	2.0	1.7-4.1	0	≤ 250	aesthetic
Chromium Total (mg/L)	<0.001	<0.001	<0.001	0	0.05	health
Color Apparent (ACU)	12	2	1-3		none	
Color True (TCU)	10	1	1-2	0	≤ 15	aesthetic
Conductivity (umhos/cm)	9	32	23-38		none	
Copper Total (mg/L)	<0.002	<0.002	<0.002	0	≤ 1	aesthetic
Cyanide Total (mg/L)	<0.02	<0.02	<0.02	0	0.2	health
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	health
Hardness as $CaCO_3$ (mg/L)	2.67	2.67	2.51-2.87		none	
Iron Dissolved (mg/L)	0.02	0.02	0.01-0.04		none	
Iron Total (mg/L)	0.05	0.05	0.03-0.08	0	≤ 0.3	aesthetic
Lead Total (mg/L)	<0.001	<0.001	<0.001	0	0.01	health
Magnesium Total (mg/L)	0.10	0.10	0.09-0.12		none	
Manganese Dissolved (mg/L)	0.004	0.005	0.002-0.004		none	
Manganese Total (mg/L)	0.005	0.004	0.003-0.005	0	≤ 0.05	aesthetic
Mercury Total (mg/L)	<0.00005	<0.00005	<0.00005	0	0.001	health
Nickel Total (mg/L)	<0.001	<0.001	<0.001		none	
Nitrogen - Ammonia as N (mg/L)	<0.02	<0.02	<0.02		none	
Nitrogen - Nitrate as N (mg/L)	0.10	0.10	0.08-0.13	0	10	health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	1.0	health
pH	6.3	7.3	6.5-8.1	0	6.5 to 8.5	aesthetic
Phenols (mg/L)	<0.003	<0.003	<0.003		none	
Phosphorus Total (mg/L)	<0.005	<0.005	<0.005		none	
Potassium Total (mg/L)	0.12	0.12	0.11-0.12		none	
Residue Total (mg/L)	17	28	26-31		none	
Residue Total Dissolved (mg/L)	13	26	23-29	0	≤ 500	aesthetic
Residue Total Fixed (mg/L)	12	21	20-23		none	
Residue Total Volatile (mg/L)	5	8	6-9		none	
Selenium Total (mg/L)	<0.001	<0.001	<0.001	0	0.01	health
Silica as SiO_2 (mg/L)	2.5	2.4	2.1-2.6		none	
Silver Total (mg/L)	<0.001	<0.001	<0.001		none	
Sodium Total (mg/L)	<0.5	6.4	6.2-6.8	0	≤ 200	aesthetic
Sulphate (mg/L)	0.7	0.7	0.7-0.8	0	≤ 500	aesthetic
Turbidity (NTU)	0.47	0.40	0.21-0.97			
UV254 (Abs/cm)	0.067	0.029	0.013-0.041		none	
UV254 App. (Abs/cm)	0.075	0.023	0.016-0.045		none	
Zinc Total (mg/L)	0.004	<0.002	<0.002	0	≤ 5	aesthetic

These figures are average values from a number of laboratory analyses done throughout the year. Where the range is a single value no variation was measured for the samples analyzed. Methods and terms are based on those of "Standard Methods of Water and Waste Water" 21st Edition 2005. Less than (<) denotes not detectable with the technique used for determination. Untreated water is from the intake prior to chlorination, treated water is from a single site in the Metro Vancouver distribution system downstream of chlorination. Guidelines are taken from "Guidelines for Canadian Drinking Water Quality - Sixth Edition" Health and Welfare Canada 1996, updated to Dec 2010. Coquitlam water is treated with ozone for primary disinfection, chlorine for secondary disinfection, and soda ash to increase pH and alkalinity.

Physical and Chemical Analysis of Water Supply

Greater Vancouver Water District

2010 - Seymour Water System (Treated results are post Filtration)

Parameter	Untreated	Treated				
	Average	Average	Range	Days Guideline Exceeded	Canadian Guideline Limit	Reason Guideline Established
Alkalinity as $CaCO_3$ (mg/L)	3.3	8.4	6.3-11.1		none	
Aluminum Dissolved (mg/L)	0.06	0.04	<0.01-0.08		none	
Aluminum Total (mg/L)	0.08	0.04	0.01-0.09	0	0.2	operational
Antimony Total (mg/L)	<0.002	<0.002	<0.002	0	0.006	health
Arsenic Total (mg/L)	<0.005	<0.001	<0.001	0	0.010	health
Barium Total (mg/L)	0.004	0.004	0.003-0.004	0	1.0	health
Boron Total (mg/L)	<0.02	<0.02	<0.02	0	5.0	health
Bromate (mg/L)		<0.01	<0.01	0	0.01	health
Bromide (mg/L)	<0.01	<0.01	<0.01		none	
Cadmium Total (mg/L)	<0.0005	<0.0005	<0.0005	0	0.005	health
Calcium Total (mg/L)	1.62	3.27	1.38-4.35		none	
Carbon Organic Dissolved (mg/L)	1.5	0.7	0.5-1.0		none	
Carbon Organic Total (mg/L)	1.59	0.72	0.49-0.96		none	
Chlorate (mg/L)		<0.01	<0.01	0	1.0	health
Chloride Total (mg/L)	<0.5	2.4	1.8-2.8	0	≤ 250	aesthetic
Chromium Total (mg/L)	<0.001	<0.001	<0.001	0	0.05	health
Color Apparent (ACU)	15	1	1-2		none	
Color True (TCU)	12	1	1-2	0	≤ 15	aesthetic
Conductivity (uniho/cm)	32	32	26-38		none	
Copper Total (mg/L)	<0.002	<0.002	<0.002	0	1.0	aesthetic
Cyanide Total (mg/L)	<0.02	<0.02	<0.02	0	0.2	health
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	health
Hardness as $CaCO_3$ (mg/L)	4.64	8.77	5.67-11.5		none	
Iron Dissolved (mg/L)	0.07	<0.01	<0.01		none	
Iron Total (mg/L)	0.14	<0.01	<0.01	0	≤ 0.3	aesthetic
Lead Total (mg/L)	<0.001	<0.001	<0.001	0	0.01	health
Magnesium Total (mg/L)	0.14	0.15	0.12-0.17		none	
Manganese Dissolved (mg/L)	0.005	0.004	0.003-0.007		none	
Manganese Total (mg/L)	0.006	0.004	0.003-0.008	0	≤ 0.05	aesthetic
Mercury Total (mg/L)	<0.00005	<0.00005	<0.00005	0	0.001	health
Nickel Total (mg/L)	<0.001	<0.001	<0.001		none	
Nitrogen - Ammonia as N (mg/L)	<0.02	<0.02	<0.02		none	
Nitrogen - Nitrate as N (mg/L)	0.06	0.06	0.02-0.09	0	10	health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	1.0	health
pH	6.4	7.1	6.4-7.4	1	6.5 to 8.5	aesthetic
Phenols (mg/L)	<0.005	<0.005	<0.005		none	
Phosphorus Total (mg/L)	<0.005	<0.005	<0.005-0.006		none	
Potassium Total (mg/L)	0.16	0.16	0.14-0.17		none	
Residue Total (mg/L)	30	24	13-31		none	
Residue Total Dissolved (mg/L)	15	22	11-28	0	≤ 500	aesthetic
Residue Total Fixed (mg/L)	10	18	9-25		none	
Residue Total Volatile (mg/L)	6	5	3-8		none	
Selenium Total (mg/L)	<0.001	<0.001	<0.001	0	0.01	health
Silica as SiO_2 (mg/L)	3.1	3.2	2.7-3.8		none	
Silver Total (mg/L)	<0.001	<0.001	<0.001		none	
Sodium Total (mg/L)	<0.5	5.1	4.3-6.9	0	≤ 200	aesthetic
Sulphate (mg/L)	1.2	3.0	1.8-5.5	0	≤ 500	aesthetic
Turbidity (NTU)	0.63	0.05	0.02-0.19			
UV254 (Abs/cm)	0.071	0.012	0.007-0.016		none	
Zinc Total (mg/L)	<0.002	<0.002	<0.002	0	≤ 5	aesthetic

These figures are average values from a number of laboratory analyses done throughout the year. Where the sample is a single value no variation was measured for the sample. Analytical Methods and terms are based on those of "Standard Methods of Water and Waste Water" 21st Edition 2005. Less than (<) denotes not detectable with the technique used for determination. Untreated water is from the intake prior to chlorination. Treated water is from a single site in the Greater Vancouver distribution system. Determination of Aesthetic conditions are taken from "Guidelines for Canadian Drinking Water Quality - Sixth Edition" Health and Welfare Canada 1990, updated to Dec 2010. Seymour treated water is filtered, treated with UV light for primary disinfection, sodium hypochlorite for secondary disinfection, lime to increase pH and alkalinity and CO_2 to adjust pH. Treated water turbidities are based on on-line analyzer values.

41

Physical and Chemical Analysis of Water Supply

Greater Vancouver Water District

2010 - Capilano Water System

Parameter	Untreated	Treated			Canadian Guideline Limit	Reason Guideline Established
	Average	Average	Range	Days Guideline Exceeded		
Alkalinity as $CaCO_3$ (mg/L)	2.6	4.9	3.3-8.9		none	
Aluminum Dissolved (mg/L)	0.08	0.05	0.05		none	
Aluminum Total (mg/L)	0.1	0.07	0.07		none	
Antimony Total (mg/L)	<0.0002				0.006	health
Arsenic Total (mg/L)	<0.001				0.010	health
Barium Total (mg/L)	0.003				1.0	health
Bromate (mg/L)		<0.01	<0.01	0	0.01	health
Bromide (mg/L)		<0.01	<0.01		none	
Boron Total (mg/L)	<0.02				5.0	health
Cadmium Total (mg/L)	<0.0005				0.005	health
Calcium Total (mg/L)	1.39	1.7	1.16-3.19		none	
Carbon Organic Dissolved (mg/L)	1.4	1.3	0.8-1.6		none	
Carbon Organic Total (mg/L)	1.43	1.34	0.77-1.65		none	
Chlorate (mg/L)		0.04	0.03-0.06	0	1.0	health
Chloride Total (mg/L)	0.5	2.5	1.9-3.7	0	≤ 250	aesthetic
Chromium Total (mg/L)	0.001				0.05	health
Color Apparent (ACU)	12	5	3-8		none	
Color True (TCU)	11	4	2-6	0	≤ 15	aesthetic
Conductivity (umhos/cm)	11	18	16-18		none	
Copper Total (mg/L)	0.002				≤ 1	aesthetic
Cyanide Total (mg/L)	<0.02				0.2	health
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	health
Hardness as $CaCO_3$ (mg/L)	3.57	4.84	3.44-8.00		none	
Iron Dissolved (mg/L)	0.05	0.05	<0.01-0.11		none	
Iron Total (mg/L)	0.09	0.09	0.02-0.22	0	≤ 0.3	aesthetic
Lead Total (mg/L)	0.001				0.01	health
Magnesium Total (mg/L)	0.14	0.15	0.13-0.36		none	
Manganese Dissolved (mg/L)	0.005	0.004	<0.001-0.007		none	
Manganese Total (mg/L)	0.008	0.004	0.002-0.008	0	≤0.05	aesthetic
Mercury Total (mg/L)	<0.00005				0.001	health
Nickel Total (mg/L)	<0.001				none	
Nitrogen - Ammonia as N (mg/L)	<0.02	<0.02	<0.02		none	
Nitrogen - Nitrate as N (mg/L)	0.06	0.06	0.05-0.06	0	10	health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	1.0	health
pH	8.4	8.0	6.2-7.0	3	6.5 to 8.5	aesthetic
Phenols (mg/L)	<0.005				none	
Phosphorus Total (mg/L)	<0.005	<0.005	<0.005		none	
Potassium Total (mg/L)	0.16				none	
Residue Total (mg/L)	15	19	19		none	
Residue Total Dissolved (mg/L)	14				≤ 500	aesthetic
Residue Total Fixed (mg/L)	11	13	13		none	
Residue Total Volatile (mg/L)	5	7	7		none	
Selenium Total (mg/L)	<0.001				0.01	health
Silica as SiO_2 (mg/L)	2.0	2.8	2.8		none	
Silver Total (mg/L)	<0.001				none	
Sodium Total (mg/L)	<0.5	1.8	1.8	0	≤200	aesthetic
Sulphate (mg/L)	0.8	1.25	0.8-2.6	0	≤500	aesthetic
Turbidity (NTU)	0.43	0.44	0.24-1.2			
UV254 (Abs/cm)	0.062	0.043	0.033-0.053		none	
Zinc Total (mg/L)	<0.002				≤ 5	aesthetic

These figures are average values from a number of laboratory analyses done throughout the year. Where the result is a single value no variation was recorded for the samples analyzed. Methods and units are based on those of "Standard Methods of Water and Waste Water" 21st Edition 2005. Less than (<) denotes not detectable with the technique used for determination. Untreated water is from the intake prior to chlorination, treated water is from a sample line after 10 minutes chlorine contact time. Guidelines are taken from "Guidelines for Canadian Drinking Water Quality - Sixth Edition" Health and Welfare Canada 1989, updated to Dec 2010. Capilano source water is treated with sodium hypochlorite for disinfection. Capilano source was out of service from Jan 1 to Jan 26, June 4-June 11, and Sep 22-Dec 31 due to high turbidity.

APPENDIX – 7

PHYSICAL AND CHEMICAL ANALYSIS – COQUITLAM WATER SYSTEM

Analysis of Source Water for

Herbicides, Pesticides, Volatile Organic Compounds, Radioactivity and Uranium

Parameter	Date Collected	MAC	IMAC	AO	Seymour	Capilano	Coquitlam
Aldicarb	5-Aug-10	0.009			<0.005	<0.005	<0.005
Bendiocarb	5-Aug-10	0.04			<0.002	<0.002	<0.002
Carbaryl	5-Aug-10	0.09			<0.005	<0.005	<0.005
Carbofuran	5-Aug-10	0.09			<0.005	<0.005	<0.005
Dichlorophenol, 2,4-	5-Aug-10	0.9		≤ 0.0003	<0.0001	<0.0001	<0.0001
Pentachlorophenol	5-Aug-10	0.06		≤ 0.03	<0.00008	<0.00008	<0.00008
Tetrachlorophenol, 2,3,4,6-	5-Aug-10	0.1		≤ 0.001	<0.0001	<0.0001	<0.0001
Trichlorophenol, 2,4,6-	5-Aug-10	0.005		≤ 0.002	<0.0001	<0.0001	<0.0001
Atrazine + Metabolites	5-Aug-10		0.005		<0.001	<0.001	<0.001
Bromoxynil	5-Aug-10		0.005		<0.00002	<0.00002	<0.00002
Cyanazine	5-Aug-10		0.01		<0.005	<0.005	<0.005
Dicamba	5-Aug-10	0.12			<0.000005	<0.000005	<0.000005
Dichlorop-Methyl	5-Aug-10	0.009			<0.00008	<0.00008	<0.00008
Dichlorophenoxyacetic acid, 2,4-(2,4-D)	5-Aug-10		0.1		<0.00008	<0.00008	<0.00008
Dinoseb	5-Aug-10	0.01			<0.00002	<0.00002	<0.00002
Diquat	5-Aug-10	0.07			<0.007	<0.007	<0.007
Diuron	5-Aug-10	0.15			<0.010	<0.010	<0.010
Glyphosate	5-Aug-10		0.28		<0.010	<0.010	<0.010
Metolachlor	5-Aug-10		0.05		<0.005	<0.005	<0.005
Metribuzin	5-Aug-10	0.08			<0.005	<0.005	<0.005
Paraquat (as Dichloride)	5-Aug-10		0.01		<0.001	<0.001	<0.001
Picloram	5-Aug-10		0.19		<0.00008	<0.00008	<0.00008
Simazine	5-Aug-10		0.01		<0.002	<0.002	<0.002
Trifluralin	5-Aug-10		0.045		<0.005	<0.005	<0.005
Aldrin + Dieldrin	5-Aug-10	0.0007			<0.000005	<0.000005	<0.000005
Methoxychlor	5-Aug-10	0.9			<0.00001	<0.00001	<0.00001
Azinphos-Methyl	5-Aug-10	0.02			<0.001	<0.001	<0.001
Chlorpyrifos	5-Aug-10	0.09			<0.002	<0.002	<0.002
Diazinon	5-Aug-10	0.02			<0.002	<0.002	<0.002
Dimethoate	5-Aug-10		0.02		<0.002	<0.002	<0.002
Malathion	5-Aug-10	0.19			<0.002	<0.002	<0.002
Parathion	5-Aug-10	0.05			<0.002	<0.002	<0.002
Phorate	5-Aug-10	0.002			<0.001	<0.001	<0.001
Terbufos	5-Aug-10		0.001		<0.0001	<0.0001	<0.0001
Benzene	5-Aug-10	0.005			<0.0005	<0.0005	<0.0005
Carbon Tetrachloride	5-Aug-10	0.005			<0.001	<0.001	<0.001
Dichlorobenzene, 1,2-	5-Aug-10	0.20		≤ 0.003	<0.0005	<0.0005	<0.0005
Dichlorobenzene, 1,4-	5-Aug-10	0.005		≤ 0.001	<0.0005	<0.0005	<0.0005
Dichloroethane, 1,2-	5-Aug-10		0.005		<0.0005	<0.0005	<0.0005
Dichloroethylene, 1,1-	5-Aug-10	0.014			<0.0005	<0.0005	<0.0005
Dichloromethane	5-Aug-10	0.05			<0.002	<0.002	<0.002

Parameter	Date Collected	MAC	IMAC	AO	Seymour	Capilano	Coquitlam
Ethylbenzene	5-Aug-10			≤ 0.0024	<0.0005	<0.0005	<0.0005
Monochlorobenzene	5-Aug-10	0.08		≤ 0.03	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	5-Aug-10	0.03			<0.0005	<0.0005	<0.0005
Toluene	5-Aug-10			≤ 0.024	<0.0005	<0.0005	<0.0005
Trichloroethylene	5-Aug-10	0.005			<0.0005	<0.0005	<0.0005
Vinyl Chloride	5-Aug-10	0.002			<0.0005	<0.0005	<0.0005
Xylene (Total)	5-Aug-10			≤ 0.3	<0.001	<0.001	<0.001
Acenaphthene	5-Aug-10				<0.00001	<0.00001	<0.00001
Acenaphthylene	5-Aug-10				<0.00001	<0.00001	<0.00001
Anthracene	5-Aug-10				<0.00001	<0.00001	<0.00001
Benzo(a)anthracene	5-Aug-10				<0.00001	<0.00001	<0.00001
Benzo(b)fluoranthene	5-Aug-10				<0.00001	<0.00001	<0.00001
Benzo(k)fluoranthene	5-Aug-10				<0.00001	<0.00001	<0.00001
Benzo(g,h,i)perylene	5-Aug-10				<0.00002	<0.00002	<0.00002
Benzo(a)pyrene[7]	5-Aug-10	0.00001			<0.00001	<0.00001	<0.00001
Chrysene	5-Aug-10				<0.00001	<0.00001	<0.00001
Dibenzo(a,h)anthracene	5-Aug-10				<0.00002	<0.00002	<0.00002
Fluoranthene	5-Aug-10				<0.00001	<0.00001	<0.00001
Fluorene	5-Aug-10				<0.00001	<0.00001	<0.00001
Indeno(1,2,3-c,d)pyrene	5-Aug-10				<0.00002	<0.00002	<0.00002
Naphthalene	5-Aug-10				<0.00005	<0.00005	<0.00005
Phenanthrene	5-Aug-10				<0.00001	<0.00001	<0.00001
Pyrene	5-Aug-10				<0.00001	<0.00001	<0.00001
Methyl t-butyl ether (MTBE)	5-Aug-10			0.015	<0.004	<0.004	<0.004
Nitrilotriacetic Acid (NTA)	5-Aug-10	0.4			<0.05	<0.05	<0.05
Uranium	5-Aug-10	0.02			<0.0001	<0.0001	<0.0001
Radioactivity (Screening Levels)							
Gross Alpha, Bq/L	5-Aug-10	<0.1			**0.02**	<0.01	**0.02**
Gross Beta, Bq/L	5-Aug-10	<1			**0.02**	**0.02**	<0.02
Natural Radionuclides by Gamma - Spectroscopy							
Uranium-235 series (Bq/L):							
Uranium-235	5-Aug-10				<0.3	<0.3	<0.2
Thorium-227	5-Aug-10				<0.3	<0.3	<0.2
Radium-223	5-Aug-10	0.5			<0.2	<0.2	<0.2
Radon-219	5-Aug-10				<0.2	<0.3	<0.3
Lead-211	5-Aug-10				<2	<1	<1
Uranium-238 series (Bq/L):							
Thorium-234	5-Aug-10				<0.8	<0.7	<0.9
Thorium-230	5-Aug-10				<4	<6	<6
Radium-226	5-Aug-10				<0.01	<0.01	<0.01
Lead-214	5-Aug-10				<0.1	<0.1	<0.09
Bismuth-214	5-Aug-10				<0.1	<0.1	<0.1
Lead-210	5-Aug-10	0.2			<1.0	<0.7	<1.0
Thorium-232 series (Bq/L):		0.1					

Parameter	Date Collected	MAC	IMAC	AO	Seymour	Capilano	Coquitlam
Actinium-228	5-Aug-10				<0.2	<0.2	<0.2
Lead-212	5-Aug-10				<0.3	<0.08	<0.1
Bismuth-212	5-Aug-10				<0.4	<0.4	<0.3
Thallium-208	5-Aug-10				<0.06	<0.4	<0.05
Potassium-40	5-Aug-10				<0.6	<1	<0.7

Footnotes:

Units are as stated mostly in milligrams per litre (mg/L) except for Gross alpha, Gross beta, and gammas which are in Becquerels/litre (Bq/L).

A private CALA-accredited BC laboratory analyzed special organics, NTA, and uranium.

A Saskatchewan research laboratory analyzed gross alpha and gross beta radioactivity and gamma radionuclides. The sensitivity of <0.01 Bq/L for Radium-226 was achieved by using Alpha spec method with lower detection levels.

[1]Benzopyrene is the only PAH compound that has a guideline limits.

Monitoring of Selected Metro Vancouver Water Mains for BTEXs

Parameters	Date Sampled	MAC* mg/L	AO* mg/L	Maple Ridge Main at Reservoir	Barnston Island Main at Willoughby PS	Jericho-Clayton Main	South Burnaby Main #2
Benzene	13-Sep-10	0.005		<0.0004	<0.0004	<0.0004	<0.0004
Ethylbenzene	13-Sep-10		≤0.0024	<0.0004	<0.0004	<0.0004	<0.0004
Toluene	13-Sep-10		≤0.024	<0.0004	<0.0004	<0.0004	<0.0004
Xylenes (Total)	13-Sep-10		≤0.3	<0.0004	<0.0004	<0.0004	<0.0004

Monitoring of Selected Metro Vancouver Mains for PAHs

Parameters	Date Sampled	MAC*	Coquitlam Main 2/3	Westburnco Reservoir	Barnston Island	Queens-borough	Whalley-Kennedy Link	Haney Main	36 Ave. Main
Acenaphthene	12-Aug-10		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Acenaphthylene	12-Aug-10		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Anthracene	12-Aug-10		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(a)anthracene	12-Aug-10		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(b)fluoranthene	12-Aug-10		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(k)fluoranthene	12-Aug-10		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(g,h,i)perylene	12-Aug-10		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Benzo(a)pyrene[1]	12-Aug-10	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Chrysene	12-Aug-10		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Dibenzo(a,h)anthracene	12-Aug-10		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	12-Aug-10		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	12-Aug-10		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Indeno(1,2,3-c,d)pyrene	12-Aug-10		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Naphthalene	12-Aug-10		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Phenanthrene	12-Aug-10		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Pyrene	12-Aug-10		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001

APPENDIX – 8

2008 OPERATING PERMIT

fraserhealth HEALTH PROTECTION

PERMIT TO OPERATE

A Drinking Water System with 301-10000 Connections

Water Supplier: District of Pitt Meadows
Facility Name: District of Pitt Meadows Water System

Conditions of Permit

By December 31, 2010, the drinking water that you provide must have undergone treatment that achieves the following:

1. At least a 4-log (99.99%) reduction and/or inactivation of viruses
2. At least a 3-log (99.9%) reduction and/or inactivation of Giardia cysts
3. At least a 3-log (99.9%) reduction and/or inactivation of Cryptosporidium oocysts

A written update on the status of the plan to meet these terms and conditions shall be submitted to Fraser Health Authority by March 31st of each calendar year.

20-Jul-2006
Effective Date

Public Health Inspector

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