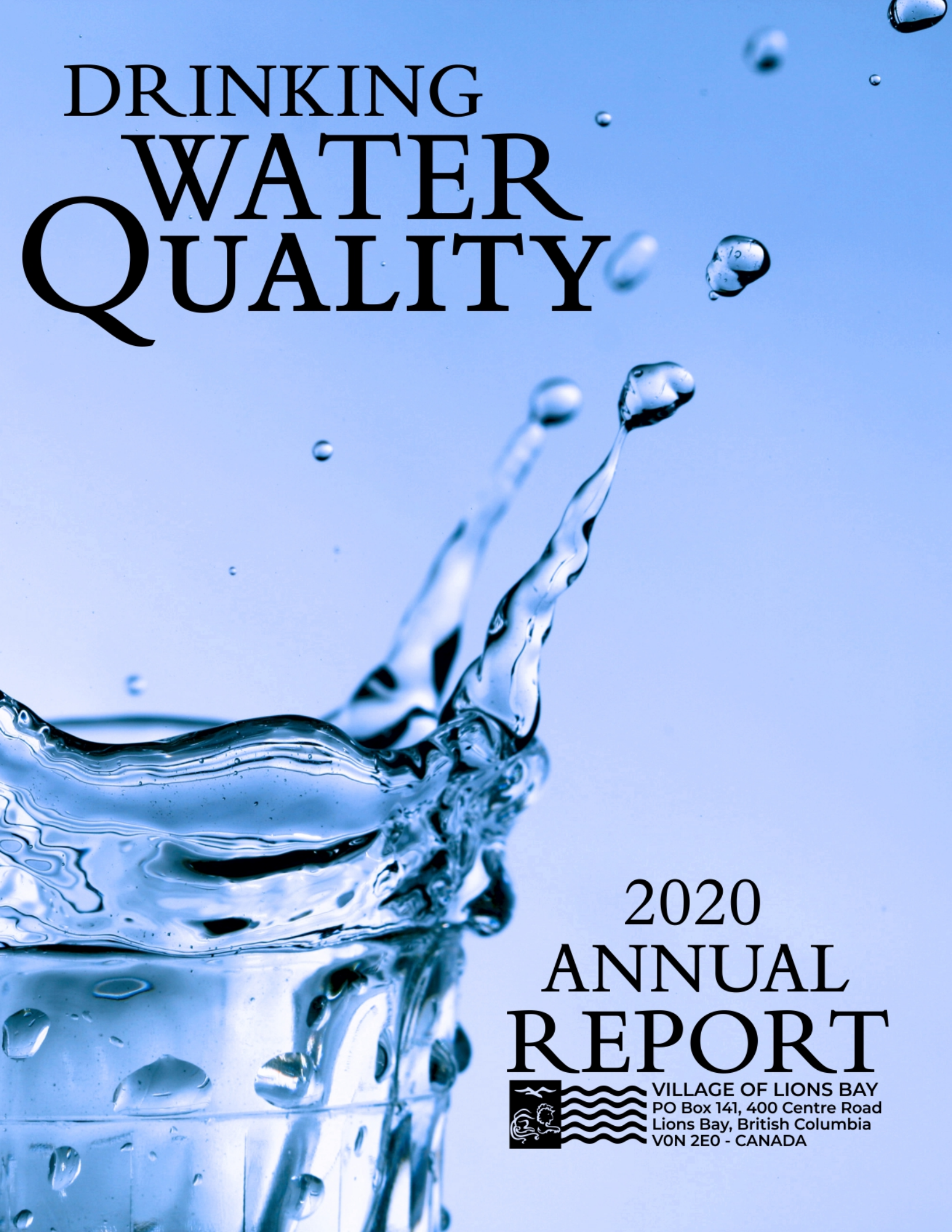


DRINKING WATER QUALITY



2020 ANNUAL REPORT



VILLAGE OF LIONS BAY
PO Box 141, 400 Centre Road
Lions Bay, British Columbia
V0N 2E0 - CANADA

LIST OF ABBREVIATIONS

AC	=	Asbestos Cement
BBR	=	Brunswick Beach Road
BWA	=	Boil Water Advisory
CCT	=	Chlorine Contact Time
CEU	=	Continuing Education Unit
CI	=	Cast Iron
CWWF	=	Clean Water and Wastewater Fund
DI	=	Ductile Iron
DWPO	=	Drinking Water Protection Officer
E. coli	=	Escherichia Coli
EMBC	=	Emergency Management BC
EOCP	=	Environmental Operators Certification Program
EPA	=	US Environmental Protection Agency
FLNRO	=	Ministry of Forests, Lands, Natural Resources, and Operations
GVWD	=	Greater Vancouver Water District
HOCl	=	Hypochlorous Acid
KGW	=	Kelvin Grove Way
L	=	Litre
LBA	=	Lions Bay Avenue
m ³	=	Cubic Meters
mg	=	Milligram
ML	=	Mega Litre
mL	=	Millilitre
MOU	=	Memorandum of Understanding
NaOCl	=	Sodium Hypochlorite
NBCF	=	New Building Canada Fund
NRW	=	Non-Revenue Water
NTU	=	Nephelometric Turbidity Units
OCl ⁻	=	Hypochlorite Ion
ppb	=	Parts Per Billion
ppm	=	Parts Per Million (Equal To 1 Mg/L)
PRV	=	Pressure Reducing Valve
PVC	=	Polyvinyl Chloride
SCADA	=	Supervisory Control and Data Acquisition
THM	=	Trihalomethane
UBC	=	University of British Columbia
USEPA	=	United States Environmental Protection Agency
UV	=	Ultraviolet
UVT	=	Ultraviolet Transmittance
VCH	=	Vancouver Coastal Health Authority
VOLB	=	Village of Lions Bay
WHO	=	World Health Organization
WTP	=	Water Treatment Plant

Contents

LIST OF ABBREVIATIONS	2
EXECUTIVE SUMMARY	5
COVID-19 IMPACTS	5
INTRODUCTION	6
BACKGROUND	6
SOURCE WATER	7
Licenses	7
FOUR BARRIER APPROACH TO WATER QUALITY	7
Water Treatment.....	7
Primary Barrier – UV Disinfection	8
Secondary Barrier – Sodium Hypochlorite	8
Distribution System	9
Tertiary Barrier – Water Sampling.....	9
Quaternary Barrier – Water Main Flushing & Tank Cleaning	9
MULTIBARRIER SYSTEM AND FILTRATION EXEMPTION	10
OPERATOR TRAINING.....	14
DRINKING WATER QUALITY PARAMETERS & RESULTS.....	15
Water Quality Sampling And Monitoring.....	15
Bacteriological Monitoring And Results	16
Free Chlorine [Chlorine Residual]	17
Turbidity.....	18
Disinfection BY-PRODUCTS	19
CHALLENGES AND CONCERNS WITH LIONS BAY’S WATER.....	20
Adequate Supply	20
Water Consumption And Per Capita Use	20
Non-revenue Water	20
Residential Consumption.....	21
Increased Turbidity.....	22
Intake Blockages.....	23
Annual Work Programs.....	23
2020 Accomplishments	23
2021 Work Program	24
APPENDIX A – HARVEY AND MAGNESIA CREEK RAW WATER UVT RATES	25
APPENDIX B – HARVEY AND MAGNESIA RAW WATER TURBIDITY GRAPH	33
APPENDIX C – SAMPLE STATIONS AND TESTS	35
APPENDIX D – RESPONSE TO POTENTIAL CONTAMINATION	37
E. Coli Positive Samples	38
Chemical Contamination	38
Turbidity Events.....	39
Disinfection Failures	39
Loss Of Pressure Due To High Demand	39
Water Main Breaks.....	40
Lack Of Water Due To Drought Or Other Causes	40
APPENDIX E – TREATED WATER TURBIDITY AND CHLORINE RESIDUAL READINGS	42
APPENDIX F – CHLORINE RESIDUAL AGAINST TURBIDITY GRAPHS	53
Harvey Creek Water Supply	54

Magnesia Creek Water Supply	57
APPENDIX G – BIENNIAL METALS AND CHEMISTRY RESULTS.....	59
March 17, 2020 Results	60
September 17, 2019 Results	67
APPENDIX H – METRO VANCOUVER AVERAGE ANNUAL DAILY CONSUMPTION	74

EXECUTIVE SUMMARY

The Village of Lions Bay (Municipality) is a supplier and distributor of water through two surface water supplies: Magnesia Creek and Harvey Creek. In accordance with the requirements of the *Drinking Water Protection Regulation*, the Municipality sends weekly drinking water samples from various locations throughout its water distribution system to an independent third-party laboratory for analysis. Test results are communicated to the Municipality and Vancouver Coastal Health (VCH) every week and documented in this annual report. In 2020, the Municipality met all regulatory requirements for drinking water quality set out in the *Drinking Water Protection Regulation*:

- ◆ No treated water samples tested positive for E. coli.
- ◆ For each 30-day period, over 90% of samples had 0 total coliform per 100 mL, and no treated water sample had more than 10 total coliforms per 100 mL.

In monitoring unregulated drinking water quality parameters, the Municipality follows and compares laboratory results to the Health Canada Guidelines for Drinking Water Quality. Where Health Canada recommendations are not present, the Municipality follows U.S. Environmental Protection Agency (EPA) recommendations. In 2020, treated water in the Village of Lions Bay did not exceed any maximum limits recommended by Health Canada or the EPA.

COVID-19 IMPACTS

There is no disputing the fact that 2020 was a year like no other in Canada and across the globe. While much of the country and the world slowed down in 2020 because of the COVID-19 Pandemic, Public Works certainly did not; however, it is important to note that some factors did impact our drinking water system operations plans. For one, sampling frequencies were reduced at the direction of the Drinking Water Protection Officer (DWPO). Also impacted was our ability to engage engineers for the review of our chlorine contact times and reservoir levels, availability, and scheduling during the early part of the Pandemic postponed this study from March well into October, with the final report due in 2021. Finally, our 2020 plan to upgrade the Harvey UV reactors was also delayed.

While we were faced with many challenges from how we interacted with each other to how we could accomplish our tasks while maintaining worker safety, Public Works staff continued to provide safe clean drinking water that did not contravene any Health Canada Guidelines for Drinking Water Quality.

INTRODUCTION

The Municipality operates a Municipal Water Utility under the provisions of the provincial *Local Government Act*, the *Drinking Water Protection Act*, and the *Drinking Water Protection Regulation*. These obligate the Municipality to meet several requirements, including:

- ◆ Operating the utility under permit issued by the Provincial Ministry of Health Services
- ◆ Engaging in water quality monitoring, and
- ◆ Preparing an annual report on water quality for the year.

The Provincial Ministry of Health develops and maintains the *Drinking Water Protection Act* and the *Drinking Water Protection Regulation*. Administration and enforcement of the legislative regulations and requirements falls to regional Medical Health Officers who work with municipalities to provide safe drinking water and to notify local residents of water quality problems.

This report comprises the 2020 Drinking Water Quality Annual Report prepared by the Municipality in accordance with our annual Operating Permit¹ for each plant issued by the Medical Health Officer. The purpose of this report is to provide Municipal residents with drinking water sampling test results for 2020, as well as to present background information on Municipality-specific issues concerning water supply, treatment, and distribution as well as measures being taken to protect and enhance drinking water quality.

BACKGROUND

Lions Bay is a small, picturesque, seaside Municipality nestled at the base of southern British Columbia's Coast Mountain Range. Situated approximately 11 km north of Horseshoe Bay along Howe Sound, the Municipality is a member of the Metro Vancouver Regional District (Metro Vancouver). However, unlike the many member municipalities comprising Metro Vancouver who receive their water supply from the Greater Vancouver Water District (GVWD), the Municipality operates its own water supply, treatment, and distribution system. The Municipality's water system is responsible for providing potable (safe to drink) water to their 1334 residents for domestic, irrigation and fire protection usage.

Water supply for the Municipality is drawn from two local creeks – Harvey Creek and Magnesia Creek. This raw water is treated and conveyed to the consumers through the following distribution system infrastructure:

- ◆ 2 raw water intakes (Harvey Creek, Magnesia Creek)
- ◆ 2 water treatment plants (Harvey Creek WTP, Magnesia Creek WTP)
- ◆ 5 potable water tanks
- ◆ 17 km of water main (various sizes and materials)
- ◆ 13 pressure reducing valve stations

¹ VCH Facility Numbers: 3317552347 (Magnesia Creek) and 3317552348 (Harvey Creek)

- ◆ 551 property service connections
- ◆ 72 hydrants
- ◆ 250 valves

The system is separated into eighteen pressure zones with the boundaries along each pressure zone comprised of a series of closed valves and pipes, and pressure reducing valve (PRV) stations. These pressure zones serve to decrease water pressure to an acceptable range for delivery to end users.

Potable water from the system is analyzed for the presence of microbiological pathogens (and other indicator organisms) and metals by laboratories approved by the Medical Health Officer. Testing for chlorine residuals and turbidity levels is conducted by EOCP Certified in-house staff.

SOURCE WATER

The Municipality's watershed areas include Magnesia Creek (421 hectares), Harvey Creek (635 hectares), Alberta Creek (51 hectares), and Rundle Creek (20 hectares). The Municipality's total water supply is only drawn from the Magnesia Creek and Harvey Creek watersheds.

LICENSES

The Municipality holds six water licenses, issued by the Ministry of Environment. Of these licenses, five are currently being utilized. Table 1 lists the licenses and quantity of water associated with each.

Table 1. Municipal Water Licenses

License No	Metric Quantity (m ³ /year)	Stream Name
C059405	45,460.90	Magnesia Creek
C065267	19,911.87	Magnesia Creek
C065316	33,186.46	Magnesia Creek
C042330	82,966.14	Alberta Creek *
C119916	41,483.07	Harvey Creek
C119917	248,898.43	Harvey Creek

*Alberta Creek is not currently utilized by the Municipality.

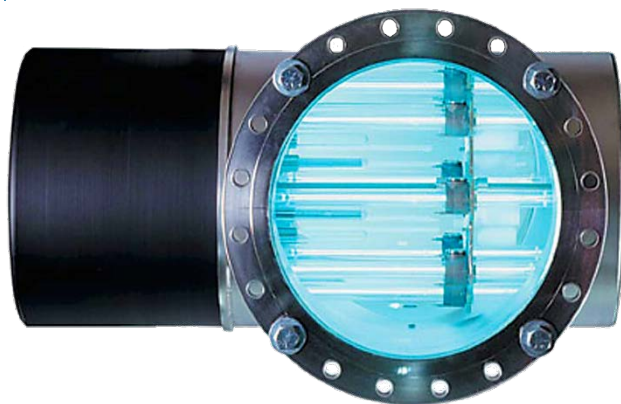
FOUR BARRIER APPROACH TO WATER QUALITY

The Municipality uses a "4-barrier" approach to mitigate source water quality issues that include the potential for waterborne disease, seasonal raw water turbidity fluctuations, and bacterial regrowth in its treatment and distribution systems.

WATER TREATMENT

The first two barriers pertain to the treatment of raw water from the Harvey and Magnesia Creek intakes and includes primary ultraviolet (UV) disinfection and secondary chlorine disinfection.

PRIMARY BARRIER – UV DISINFECTION



Inside a Trojan Swift UV Reactor

Raw water passes through a UV reactor, each housing two specialized lamps that emit UV light, which alters the DNA of microorganisms' cells, inactivating them and impeding reproduction. UV light is a very effective disinfectant and has a demonstrated efficacy against pathogenic organisms, including those responsible for cholera, polio, typhoid, hepatitis, *Giardia*, *Cryptosporidium* and other bacterial, viral and parasitic diseases.

UV treatment is affected by turbidity, which is defined as a cloudiness or haziness in water that is caused by matter such as organics, minerals, or chemicals. This matter can absorb or scatter UV light, resulting in decreased efficiency of the UV light's ability to inactivate microorganisms. UV transmittance (UVT) is a measurement of the amount of ultraviolet light that passes through a water sample compared to the amount of light that passes through a pure water sample. In instances where UVT declines, the UV reactor will automatically increase the UV lamp intensity to counter lower UVT. If the UV reactor cannot maintain the required UVT dose, the Supervisory Control and Data Acquisition (SCADA) system will notify the Municipal staff, and the UV reactor shuts down stopping the production of treated water.

SECONDARY BARRIER – SODIUM HYPOCHLORITE

Once through the UV reactor, the disinfected water is injected with sodium hypochlorite (NaOCl). When NaOCl dissolves in water, two substances form, which play a role in for oxidation and disinfection. These are hypochlorous acid (HOCl) and the hypochlorite ion (OCl⁻). As a strong oxidizing agent, NaOCl kills microorganisms by damaging and disrupting two processes critical for a cell's survival: cell respiration and DNA activity. Soon after adding NaOCl to water, the chlorine within the compound begins reacting with the inorganic and organic matter and microbes that commonly grow in water supply reservoirs, on the walls of water mains, and in storage tanks, and neutralizes them², thereby causing chlorine levels to degrade. Public Works



Debris buildup and biofilm formation within a section of ductile iron water main

² Calderon, R. L. (2000). "The Epidemiology of Chemical Contaminants of Drinking Water". Food and Chemical Toxicology. 38 (1 Suppl): S13–S20. doi:10.1016/S0278-6915(99)00133-7. PMID 10717366.

staff monitors the chlorine levels in water throughout the distribution system on a daily (workdays) basis to ensure enough chlorine is present to inactivate contaminants. This measurement, identified as the chlorine residual, constitutes an important safeguard against the risk of subsequent microbial contamination after treatment.

DISTRIBUTION SYSTEM

The balance of the 4-barrier approach pertains to the water distribution system and includes water quality monitoring (daily, weekly, and biannually) throughout the distribution system as well as a system maintenance program that consists of water main flushing and water tank internal cleaning. These two barriers are intended to ensure chlorine residual within the system after treatment by purging any potential contaminants from within the system.

The Municipal distribution system's main components include water mains and storage tanks. The system's water mains are constructed primarily of ductile iron (DI); however, a variety of materials including asbestos cement (AC), cast iron (CI), and polyvinyl chloride (PVC) also exist within the Municipality. The oldest pipes in the Municipality's distribution system were installed between 1970 and 1971. Four of the system's tanks are cast in place concrete and one, the newly constructed Harvey Creek tank is a glass-fused bolted steel tank. Table 2 lists their capacity and the year in which they were built. It is anticipated that in 2021, both the Phase IV and Phase V tanks will be eliminated from the system, replaced by a pressure reducing valve station at Upper Bayview Road.

Table 2. Potable Water Storage Tanks

Tank	Capacity (ML)	Year Built
Harvey	2.36	2019
Magnesia	0.44	1997
Phase IV	0.08	1960
Phase V	0.10	1960
Highway	0.09	1960

TERTIARY BARRIER – WATER SAMPLING

The Municipality's Public Works staff draw samples throughout the distribution system on a daily (workdays) basis to ensure a chlorine residual within the distribution network. Chlorine residuals are monitored at the treatment plants, in the middle, and at the ends of the distribution system with dosages being adjusted to ensure there is enough chlorine within the system at all times.

QUATERNARY BARRIER – WATER MAIN FLUSHING & TANK CLEANING

Water main flushing is a method of cleaning water mains that involves manipulating valves and discharging water through fire hydrants or blow off points at a velocity great enough to scour the walls of the water mains. The discharged water carries sediment and other solids with it, assisting in the scouring effect. The

Municipality cleans 17 km of the distribution system twice per year using this method. In support of summer water conservation efforts, the Municipality's biannual flushing takes place in April and October.

Due to the complexity and scope of the task, cleaning of the Municipality's water storage tanks occurs on a 5-year cycle. Two methods of cleaning tanks are used by the Municipality:

1. In service cleaning: Water tanks remain in service providing potable water to the residents. Divers are disinfected by spraying them down with chlorine after which they enter the tanks and use vacuum equipment to remove sediment build up from the bottom of the tanks.
2. Water tanks are bypassed removing them from service after which they are drained of all water. Municipal staff enter the tanks to manually clean the walls and floors using scrub brushes and super-chlorinated water, after which the tanks are once again disinfected using super-chlorinated water before being put back into service.

MULTIBARRIER SYSTEM AND FILTRATION EXEMPTION

The Drinking Water Microbial Treatment Objectives for Surface Water Supplies in BC³ (the Guide) recommends that water filtration and one form of disinfection be used to meet treatment objectives. The Municipality's water system does not meet this requirement since its water is not filtered; however, the Guide does provide for filtration exemption providing certain criteria are met.

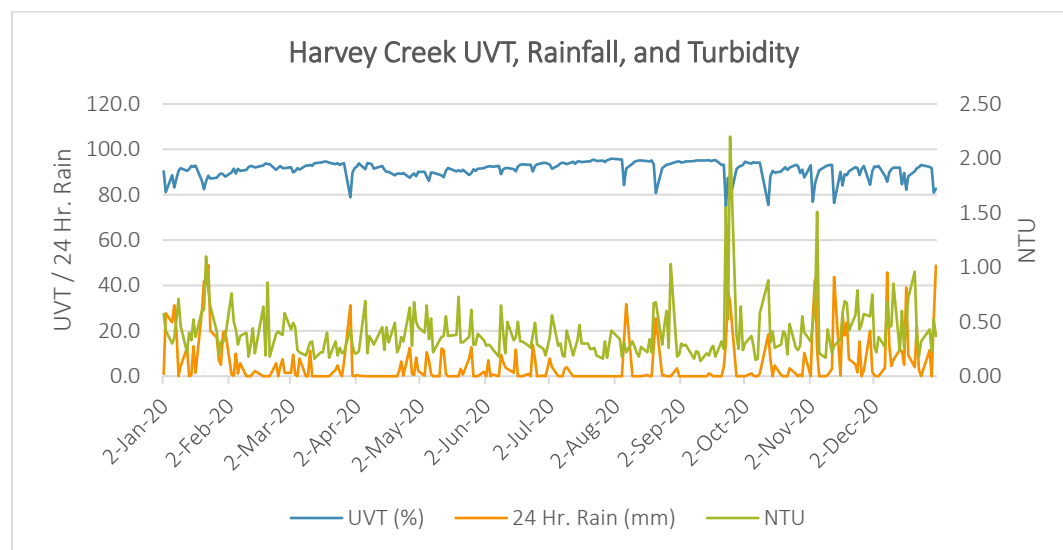
In 2010, the Municipality upgraded the treatment processes at both plants to include UV disinfection and at this time, an exemption from filtration was sought through Vancouver Coastal Health. Unfortunately, due to staff turn-over, the application for filtration exemption was never fully completed. Under the Guide, the Municipality may be permitted to operate without filtration providing the following conditions are met:

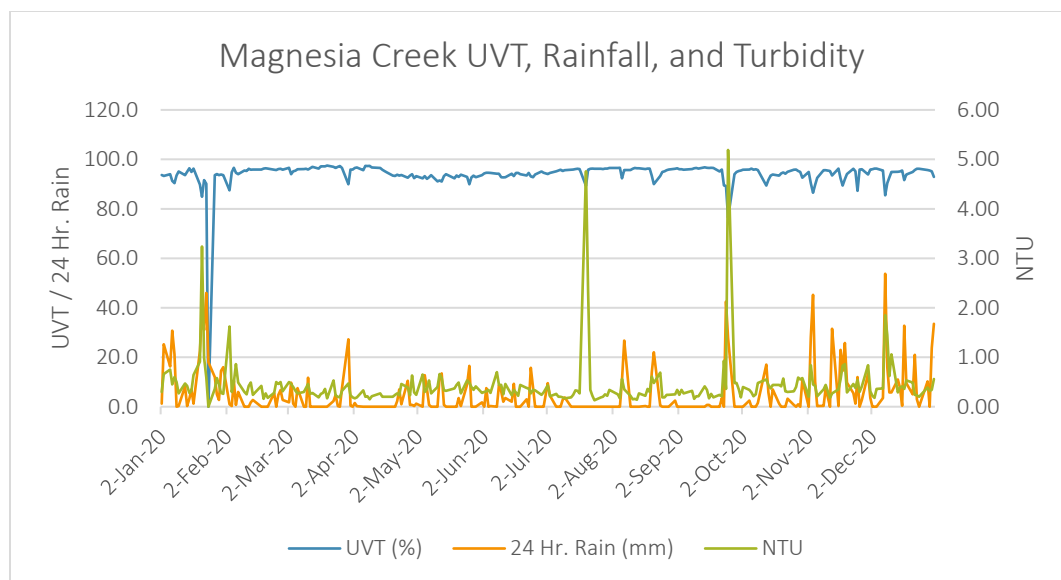
1. Overall inactivation is met using a minimum of two disinfection processes, providing 4-log reduction of viruses and 3-log reduction of *Cryptosporidium* and *Giardia*.
 - This criterion is in place as each plant is configured to use two disinfection processes; initially, raw water is treated by being subjected to UV light in the Trojan UV Reactors; and then, this treated water is injected with NaOCl. From there the water is fed into a storage tank where it is retained to achieve chlorine contact time (CCT). Thus, the current treatment system at both plants achieves the 4-log reduction of viruses during normal operating conditions as predicated by sufficient chlorine contact time (CCT) within the Magnesia and Harvey Creek water tanks.
 - **Outstanding Issue:** Both systems, but in particular, the Magnesia Creek system, have experienced outages due to land slides with resultant raw water intake blockages. During such events, water within the tanks may be drawn down significantly whilst waiting for the blockages to be cleared. Current operating procedures do not document critical tank levels and chlorine residual requirements in order to achieve CCT. Modelling of the water supply

³ See the "Drinking Water Officer's Guide – Part B 5." <https://bit.ly/2lcxigN>

for the Harvey Tank was performed prior to the new tank's installation and tank levels setpoints were determined; however, an analysis of drawdown during complete stop of incoming water was not finalized by the end of the construction process. Although staff engaged engineers to formalize tank setpoints and create outage procedures that include CCT requirements prior to the end of 2020, the COVID-19 Pandemic delayed this work and the CCT requirements report was not provided until March of 2021.

- **Outstanding Issue:** The current UV treatment systems at both plants achieve the 3-log reduction of *Cryptosporidium* and *Giardia* through the UV reactors providing a UVT of raw water of 90%. Prior to the upgrades in 2010, raw water sampling for UVT was conducted for a period of six months during the summer. This sampling indicated that raw water UVT did not drop below 90%; however, at the request of the DWPO, regular UVT measurements of raw water were initiated in May of 2019. Since this time, UVT readings demonstrate periods where the raw water UVT levels drop below the requisite 90% mark. As you can see in both graphs below, UVT correlates well with rainfall and increased turbidity events. Turbidity is measured in Nephelometric Turbidity Units (NTU's) which represents the intensity of light scattered it light passes through a water sample. In general, the UVT levels fluctuate more in the Harvey Creek watershed. The Harvey Creek Watershed had a total of 46 events where UVT dropped below the requisite mark while the Magnesia Creek Watershed only experienced 6 events. A full table of results is contained in Appendix A.





On the Harvey Creek system, 18% of the samples were below the 90% UVT requirement and on the Magnesia Creek system, 2% of the samples were below 90% UVT.

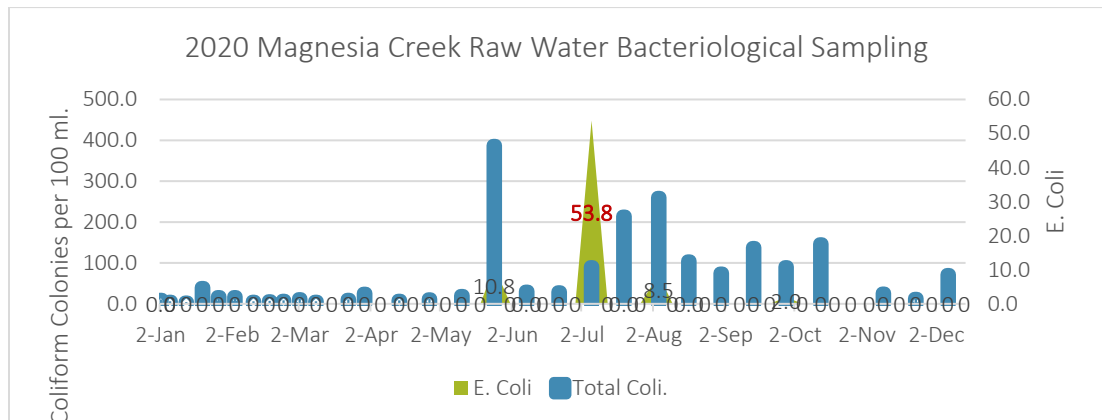
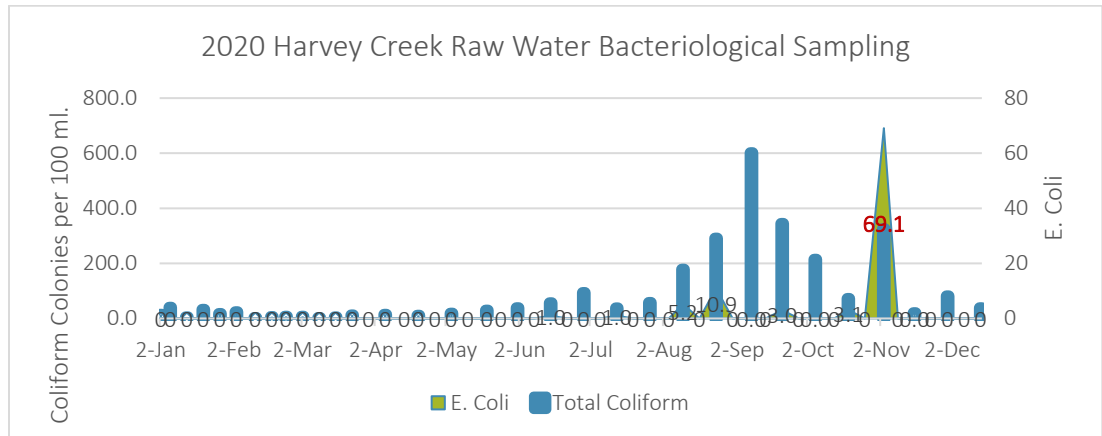
	Harvey Creek	Magnesia Creek
Sample Count	252	251
Average (%)	91.1	94.4
Maximum (%)	95.9	97.5
Minimum (%)	74.6	76.4
Samples <90%	46	6
% Below 90% (%)	18%	2%

Initial discussions with Trojan have ascertained that the Trojan Swift UV Unit can achieve the 3-log reduction of *Cryptosporidium* and *Giardia* at raw water UVT values as low as 70% but in order to do so, the dosage rate must be increased or the flow through the reactor must be reduced. Discussions between Trojan, the DWPO's office, and Public Works yielded a solution to the Harvey Creek UVT issues that would see both UV reactors at the Harvey Creek water treatment plant upgraded from 2-lamp systems to 4-lamp systems. The cost of this upgrade was included in the 2021 Budget process and approved for installation in 2021.

- The number of *E. coli* in raw water does not exceed 20/100 mL (or if *E. coli* data are not available less than 100/100 mL of total coliform) in at least 90% of the weekly samples from the previous six months. Treatment target for all water systems is to contain no detectable *E. coli* or fecal coliform per 100 mL. Total coliform objectives are also zero based on one sample in a 30-day period. For more than one sample in a 30-day period, at least 90% of the samples should have no detectable total coliform bacteria per 100 mL and no sample should have more than 10 total coliform bacteria per 100 mL. 2020 Raw water sampling was impacted by the COVID-19 Pandemic in that laboratory

resources were diverted to other areas and water quality sampling was reduced in accordance with the DWPO.

- 2020 Raw water sampling conducted indicates that E.Coli in raw water did not exceed 20/100 mL in at least 90% of the weekly samples:



- Testing throughout the distribution indicates that the bacteriological criterion is also being successfully met. Although there are two points of significant E. Coli recorded as highlighted in red (69.1 for Harvey in November and 53.8 for Magnesia in July).
- Average daily turbidity levels measured at equal intervals (at least every four hours) immediately before the disinfectant is applied are around 1 NTU, but do not exceed 5 NTU for more than two days in a 12-month period.
 - Previous reports provided turbidity readings taken by staff once per day which was insufficient to meet the requirements of this criterion. In this report, data was obtained via the Municipal SCADA system which logs NTU prior to entry into the UV reactor chamber. Readings are taken every second resulting in excessive data points that are not reasonable to be included within this report; however, a graph showing turbidity levels in the raw water from each of the two systems is shown in Appendix B (Note: The Magnesia Creek turbidity graph is skewed by what

we believe is an anomalous reading of 286.8 NTU). Based upon these readings, this criterion was not achieved.

- **Outstanding Issue:** The turbidity within both watersheds is directly linked to the alluvial nature of the geology of the area and irrespective of filtration or the current method of treatment, turbidity will be an ongoing problem in both watersheds. Currently, in order to not be impacted by excessive turbidity incidents, the system must be able to overcome high turbidity through increased UV treatment intensity or simply by shutting down during high turbidity events. As indicated previously, at higher turbidity levels, the UV reactor automatically increases lamp intensity to counter high turbidity and lower UVT. If the UV reactor cannot maintain the required UVT, the UV reactor shuts down stopping the production of treated water. Should this not suffice, further discussion with the DWPO regarding an alternative, i.e. shutting down the plant during periods of high turbidity, irrespective of the UV reactor's ability to maintain treatment, will be explored. Staff will continue to work through this issue with the DWPO.
4. A watershed control program is maintained that minimizes the potential for fecal contamination in the source water.
- Source water from both the Magnesia and Harvey Creek watersheds are under the control of the BC Ministry of Forests, Land, and Natural Resource Operations (FLNRO). Both watersheds are designated as "Community Watershed" which offers only limited protection under the Forest & Range Practices Act (FRPA). Activities such as recreational access, mining, forestry, and energy development are not precluded and are not without risk to the Municipality's source of water. In order to achieve filtration exemption, the Municipality must engage with FLNRO and develop a source water protection plan that addresses the security of the Municipality's watersheds. In the interim, the Municipality has taken to providing portable toilets at the Sunset trailhead which is the access point to the Lions and Tunnel Bluffs trails. In 2021, the Municipality will investigate installing trail counters to begin quantifying the number of users accessing its trails through the watersheds.

OPERATOR TRAINING

Another approach to mitigating issues within a water supply and distribution system is through employee training. The Environmental Operators Certification Program (EOCP) is the body charged under the *Drinking Water Protection Act* and the *Drinking Water Protection Regulation* with classifying water supply and distribution system in order to determine training requirements for system operators.

"Certified employees can maximize the performance of water and wastewater facilities, which will in turn minimize health risks and environmental concerns, optimize the costs of operations, protect

the investment in infrastructure, and provide greater return on the utility's or industry's capital investment.⁴

Under the EOCP guidelines, each system is required have a minimum of one operator, designated the “chief operator(s),” who must be certified by the EOCP at the matching classification level of the system. Additionally, any person whose actions may affect the operation of a water system requires certification by the EOCP. Certified Operators are required to earn continuing education units (CEU's) on a biannual basis to remain “In Good Standing.” This ensures that certified operators remain well trained, current, and are capable of operating and maintaining their facilities in a responsible and professional manner.

The EOCP has classified the Municipality's water treatment system as a Class 1 system and the distribution system as a Level 2 system. In 2020, the Municipality complied with operator training and had one Chief Operator classified as a Water Treatment Plant Operator Class 1 and as a Water Distribution System Operator Level 2. In 2020, a second employee achieved Level 2 Distribution bringing our complement to 1 Chief Operator with Treatment 1 and Distribution 2 as well as 2 operators with Distribution 2 and another with Distribution Level 1 certification.

DRINKING WATER QUALITY PARAMETERS & RESULTS

The Municipality is responsible for monitoring water quality in different parts of the drinking water system. The quality of water distributed within the Municipality is monitored in accordance with requirements set out in provincial regulations. This section describes the monitoring program and water quality results for 2020.

WATER QUALITY SAMPLING AND MONITORING

Water quality is monitored for regulatory compliance on a weekly basis at the Municipality's sampling locations (Table 6 and 7 in Appendix C). Samples are taken on a daily, weekly, and monthly basis by Public Works Department staff and sent to an approved laboratory for analysis. The results are communicated to the Municipality and VCH. Operational responses to undesirable results vary from re-sampling to flushing water mains to possibly issuing a boil water advisory by VCH, depending on confirmation and the significance of the parameter of concern. The Municipality's emergency response protocol to various drinking water related contingencies is provided in Appendix D.

⁴ <http://www.eocp.ca/wp-content/uploads/2014/04/EOCP-Program-Guide-1-March-2014-v13.pdf> (accessed March 24, 2018)



Analysing a water sample using a Spectrophotometer

On a daily basis (Monday to Friday) the Municipality draws water samples from stations located at the front, middle and end of the distribution system and tests them for turbidity and chlorine residual. Weekly samples from these sites are tested for bacteriological parameters. Additionally, weekly, a sample of raw water from before the UV reactor, and a sample of UV disinfected water after the UV reactor, at each of the two plants is sampled for bacteriological parameters. These samples are sent to a VCH accredited laboratory and tested for *Escherichia coli* (*E. coli*) and total coliforms. More extensive biannual testing is conducted for general water chemistry, hardness, metals, and other contaminants including organic compounds.

The monitoring program provides a representative picture of drinking water quality within the municipal water mains. It is important to note that Municipal sampling is not a definitive picture of drinking water quality in a system. Once water reaches private water systems, water quality can change significantly due to pipe material, standing time, temperature, and other factors. It can be assumed that samples taken within buildings will be of different quality than those taken from municipal mains. The Municipality is not responsible for water quality testing at the Lions Bay Community School, and on residential private property.

BACTERIOLOGICAL MONITORING AND RESULTS

The *Drinking Water Protection Regulation* requires the Municipality to carry out routine sampling and testing for *E. coli* and total coliform bacteria. These are considered “indicator organisms” because their presence or absence provides an indication of microbial water quality.

ESCHERICHIA COLI



3D rendering of a E.coli cells.

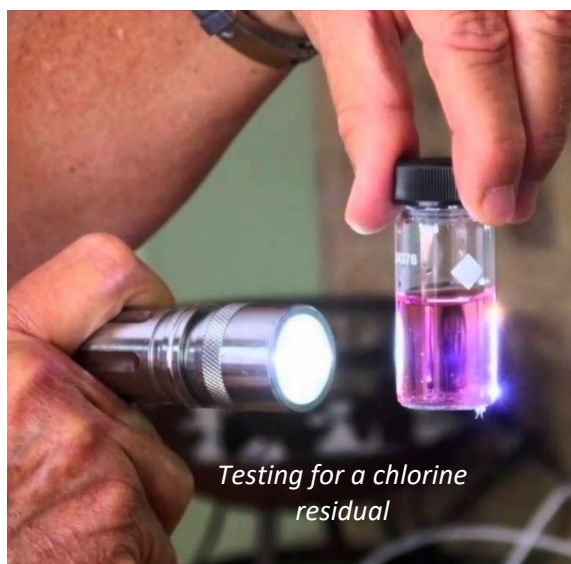
E. coli is a type of coliform bacteria present exclusively in the feces of humans and other animals. The existence of *E. coli* in a water sample indicates recent fecal contamination and the possible presence of intestinal disease-causing bacteria, viruses, and protozoa. Fecal matter can enter the water supply where humans and animals defecate in or near the watersheds and above the raw water intakes. The *Drinking Water Protection Regulation* standard for *E. coli* is none detectable per 100 ml. In 2020, none of the weekly

samples taken throughout the potable water distribution system tested positive for *E. coli*.

TOTAL COLIFORM

The total coliform group of bacteria is composed of various types with similar characteristics. The natural niches for members of this group range from being fecal-specific, such as *E. coli*, to those being widely distributed in water, soil, and vegetation. The *Drinking Water Protection Regulation* standards for total coliform indicate that there can be no detectable *E. coli* per 100 ml; and that total coliform bacteria samples (for more than 1 sample taken per month) must have at least 90% of samples with no detectable total coliform bacteria per 100 ml; and no one sample can have more than 10 total coliform bacteria per 100 ml. In 2020, weekly sampling and testing for coliform bacteria met the requirements of bacteriological testing – of the samples taken at each sampling site throughout the year, none registered coliform bacteria counts. However, one of the weekly samples taken at the UV Reactor in the Harvey Treatment plant tested positive for coliform bacteria. This result, 5 coliform bacteria per 100 ml, occurred during a turbidity event and the corresponding UVT at the time of the positive sample was 76.9%. Samplings from the extremities of the Harvey Drinking Water System indicated a maximum chlorine residual of 0.8 ppm to a minimum of 0.51 ppm. This event was discussed with the DWPO, and no further action was required. Through the balance of our samples for 2020, no other potable water samples tested positive for coliform bacteria. It is anticipated that the upgrades to the Harvey UV Reactors will enhance protection and prevent such occurrences.

FREE CHLORINE [CHLORINE RESIDUAL]



Testing for a chlorine residual

Free chlorine is not regulated by the *Drinking Water Protection Act* or the *Drinking Water Protection Regulation*. The Guidelines for Canadian Drinking Water Quality indicate that for health considerations, a “guideline value [maximum acceptable concentration level for chlorine] is not necessary due to low toxicity at concentrations found in drinking water.”

With respect to a minimum chlorine concentration [chlorine residual], no regulations exist for British Columbia. However, Health Canada reports the following:

“The U.S. Environmental Protection Agency Surface Water Treatment Rule requires a minimum disinfectant residual of 0.2 mg/L for water entering the distribution system and that a detectable level be maintained

throughout the distribution system. The World Health Organization (WHO) has suggested that, for areas with little risk of cholera or related outbreaks, a free chlorine residual range of 0.2–0.5 mg/L be maintained at all points in the supply (WHO, 1997). In general, a free chlorine residual of 0.2 mg/L is considered a

minimum level for the control of bacterial regrowth in the distribution system.⁵ Health Canada also reports that “Free chlorine concentrations in most Canadian drinking water distribution systems range from 0.04 to 2.0 mg/L.”⁶

The Municipality’s objective is to achieve a chlorine residual of 0.2 mg/L throughout our system; however, variations in chlorine residual within a distribution system are normal. When chlorine levels drop below 0.2 mg/L, staff will adjust the dosage of NaOCl at the treatment plants in order to ensure the distribution system residual maintains a minimum 0.2 mg/L at the extremities of the system. Residual chlorine concentrations are affected by various parameters such as water age, turbidity levels, pipe material, and temperature. Table 3 shows that the average free chlorine residual at all stations sampled at the eight sampling stations. Detailed 2020 free chlorine residuals for treated water is charted in Appendix E and graphs charting chlorine residuals against turbidity readings are presented in Appendix F.

Table 3. 2020 Chlorine Residual Readings (ppm)

	Harvey Creek System					Magnesia Creek System		
	Tank	PRV-3	Cafe	LBA	KGW	Tank	PRV-5	BBR
Average	0.87	0.84	0.53	0.51	0.47	0.89	0.83	0.59
Maximum	1.21	1.15	0.81	0.88	0.95	1.40	1.08	1.37
Minimum	0.20	0.17	0.17	0.15	0.19	0.29	0.23	0.20

Lions Bay Avenue (LBA), Kelvin Grove Way (KGW), Brunswick Beach Road (BBR)

TURBIDITY

Provincial guidelines for turbidity within a distribution system do not exist. Variations in turbidity within a distribution system are normal. Higher levels may be associated with turbidity in source water or local system events such as high flow rates from unidirectional flushing, fire fighting, or water main breaks. In the event that a high level of turbidity is detected, the Municipality will determine whether this is expected due to system operations. If the event is unexpected, the Municipality will confirm turbidity level and flush the mains to clear any disturbance. During periods of high turbidity, the Municipality will adjust chlorine dosages to compensate. As discussed under “Multibarrier System and Filtration Exemption” above, turbidity readings are logged by the Municipality’s SCADA system. The system logs data points every second resulting in excessive data to be included within this report. A graph indicating the raw water turbidity fluctuations experienced in both watersheds is included Appendix B.

⁵ Health Canada (2009) Guidelines for Canadian Drinking Water Quality: Guideline Technical Document—Chlorine

⁶ Health Canada (2009) Guidelines for Canadian Drinking Water Quality: Guideline Technical Document—Chlorine

DISINFECTION BY-PRODUCTS

Disinfection by-products such as trihalomethanes (THMs) can form when chlorine used to disinfect drinking water reacts with naturally occurring organic matter. Health risks may be associated with long-term exposure to high levels of THMs. Health Canada considers THMs to be possibly carcinogenic to humans. Health Canada also reports that:

“High Levels of THMs may also have an effect on pregnancy. A California study found that pregnant women who drank large amounts of tap water with high THMs had an increased risk of miscarriage. These studies do not prove that there is a link between THMs and cancer or miscarriage. However, they do show the need for further research in this area to confirm potential health effects.”

Health Canada recommends Total THMs remain below a maximum allowable concentration of 0.100 mg/L when averaged over quarterly sample results. This criterion was achieved in 2020:

Table 4. 2020 Trihalomethane Readings (mg/L)

2020 Total Trihalomethanes Laboratory Results (mg/L)				
	Lions Bay Avenue	Kelvin Grove	Community Centre	Brunswick Beach
17-Mar-20	0.0391	0.0291	0.0296	0.0148
10-Jun-20	0.0408	0.0395	0.0231	0.0363
22-Sep-20	0.0323	0.0422	0.0346	0.0277
08-Dec-20	0.0411	0.0468	0.0425	0.0198
Average:	0.0383	0.0394	0.0325	0.0247

PH

pH is a measure of the acid-base equilibrium of water. pH is of concern in a water distribution system because at low values water becomes corrosive while at high values scale can potentially form and chlorine disinfection is less efficient. Health Canada indicates that an acceptable pH range for drinking water is 6.5 – 8.5 pH units. All of the 2019 biannual distribution system samples were tested for pH. Test results ranged of 6.59 to 7.22 pH units. Full pH results are provided in Appendix G.

METALS

Metals are inorganic substances that enter our water supplies through a variety of means, some natural and some due to human activity. Some metals are essential for life while others can cause chronic or acute poisoning. Health Canada has set maximum concentration limits for most metals with the exception of calcium, cobalt, magnesium, molybdenum, nickel, or potassium.

In 2020, all samples were within the limits set in the Guidelines for Canadian Drinking Water Quality for lead. Appendix G contains metals and general chemistry test results for 2020.

⁷ <https://www.canada.ca/en/health-canada/services/healthy-living/your-health/environment/drinking-water-chlorination.html> accessed March 23, 2018.

CHALLENGES AND CONCERNS WITH LIONS BAY'S WATER

As previously mentioned, Lions Bay is one the few Metro Vancouver member municipalities that supply their own water – this comes with a unique set of challenges and concerns:

- ◆ Adequate Supply
- ◆ Consumption
- ◆ Increased Turbidity
- ◆ Intake Blockages

ADEQUATE SUPPLY

The Municipality obtains its water from the Harvey Creek and Magnesia Creek watersheds. Both of these watersheds are fed by surface water sources that are highly susceptible to reduced snowpacks, and consequently highly vulnerable to the influences of climate change. During the summer of 2015, stream flows in both creeks was diminished due to a significantly reduced snowpack accumulation the preceding winter. The Municipality was able to avert running out of water thanks to the concentrated conservation efforts of local residents.

In 2017, the Municipality signed a Memorandum of Understanding (MOU) with the Engineering Department at the University of British Columbia (UBC) to collaborate on collecting data from the watersheds in order to perform hydrological research and modelling of the water supply. This collaboration stemmed from the Municipality's desire to better understand their summer water supply situation and the impacts of climate change on the surface water supplies. Through the MOU, UBC and the Municipality intend to jointly address topics such as:

- ◆ Groundwater recharge through various precipitation events;
- ◆ Modelling of groundwater and its flows;
- ◆ Impacts of snowpack availability on groundwater and surface water flows and levels.

Ultimately, this endeavour will help the Municipality determine the long-term viability of its water sources and better guide the expenditure of capital investments in the overall system.

WATER CONSUMPTION AND PER CAPITA USE

Coupled with the seasonal variability and impacts of climate change is the historically high per capita water use by local residents. Between 2010 and 2016, residential water consumption was drastically reduced by 60%; however, this trend reversed itself after that. Over the last three years, consumption hovers between 700 and 900 liters per capita per day.

NON-REVENUE WATER

While considering the Municipality's yearly consumption, and consequently the Per Capita rate, it is important to recognize the contribution of Non-Revenue Water (NRW) to overall water use. NRW is water that has been produced at the treatment plants but is "lost" before reaching the consumer. NRW in the Municipality's water system escapes through water main breaks, service leaks, leaking joints, and activities

such as water main flushing. Public Works staff estimate Non-Revenue Water (NRW) to account for 26% of the total water consumption. The Municipality has implemented two strategies to help reduce NRW:

1. **Pressure Management** – it is a well-documented fact that high pressures coupled with aging pipes leads to higher-than-normal water loss. By continually monitoring and adjusting pressures within the distribution systems 13 pressure reducing station's (PRV's) the Municipality keeps pressures at the minimum possible level to extend water main life and reduce NRW.
2. **Active Leak Control** – the Municipality conducts a biannual leak detection program that involves checking residential lots and distribution system fire hydrants using acoustic leak detection methods to actively locate leaks. Continual monitoring of consumption rates for spikes in water use will also trigger active leak investigations. In 2020 the Active Leak Control program identified 7 private side leaks and 4 municipal side leaks.

RESIDENTIAL CONSUMPTION

By factoring out the NRW rate from the yearly consumption figures we can see that the most recent 2020 average resident water consumption rate is 947 L/capita/day. This rate is over double the Metro Vancouver average of 424 L/capita/day reported for 2019⁸, see Appendix H for the per capita consumption figures from member municipalities within Metro Vancouver. Municipality will increase its education and media campaign in an attempt to mitigate and hopefully reverse this trend in 2021. In addition, the Municipality intends to ramp up Bylaw Enforcement during the summer which will help with education and enforcement of conservation measures.

Table 5. Yearly Consumption and Per Capita Rates

Year	Yearly Consumption (m ³)	Census Population	Per Capita (L / capita / day)	Reduced Per Capita* (L / capita / day)
2011	806,522	1,318	1,677	1,241
2012	766,273	1,318	1,593	1,179
2013	827,509	1,318	1,720	1,273
2014	772,301	1,318	1,605	1,188
2015	437,433	1,318	909	673
2016	351,318	1,334	722	534
2017	472,527	1,334	970	718
2018	533,000	1,334	1,095	810
2019	508,000	1,334	1,043	772
2020	623,000	1,334	1,279	947

* The Reduced Per Capita rate is 26% lower than the per capita rate and considers system-wide water losses (non-revenue water).

⁸ http://www.metrovancouver.org/services/water/WaterPublications/2019_Water_Consumption_Statistics_Report.pdf (Metro Vancouver 2018 Water Consumption Statistics Report)

Residential water conservation offers many benefits to the Municipality including delaying or avoiding capital expenditures on water supply expansion, decreasing operating costs, and a “co-benefit” of reducing the energy required to treat and distribute drinking water. The American Water Works Association⁹ highlights the following benefits of water conservation:

- ◆ Operations and maintenance cost savings by reducing the volume of water treated.
- ◆ Future cost savings through deferral of capital investment as a result of population growth and expansion.
- ◆ Environmental benefits: less water could be removed from the environment for human purposes, and more water is available to support downstream aquatic life and important riparian habitat.
- ◆ Competing beneficial uses: more water could be available for competing beneficial uses such as watercourse health and environment, or recreation.
- ◆ Stewardship: utilities that conserve water demonstrate leadership in resource management.
- ◆ Regulatory compliance: some governmental/regulatory agencies require water conservation plans to qualify for permits, grants and loans.
- ◆ Public perception: the public often insists on a demonstration of efficient use of existing water supplies before supporting expansion of supplies to meet new water needs.

The primary water conservation initiative implemented by the Municipality is the adoption of Outdoor Water Use Bylaw No. 484, 2015. This bylaw outlines the levels of water use restrictions for residential, commercial and public water uses. The levels are posted on the Village of Lions Bay official webpage and presented on a colour coded Water Conservation Level boards throughout the Municipality. Water use outside of the applied restrictions is only permissible for new lawns through the purchase of a permit from the Municipality. Table 9. Outdoor Water Use Conservation Levels in Appendix D depicts the restrictions for typical residential, commercial, and public water use activities for each conservation level. To aid in the conservation efforts, the Municipality provides real time water consumption data on their website¹⁰.

INCREASED TURBIDITY

The Municipality draws all of its water from surface sources that are subject to fluctuating turbidity levels and are designated as unstable terrain upslope. This fluctuation in raw water turbidity presents many challenges for Municipal staff in ensuring that turbidity and chlorine residuals throughout the entire distribution system are not adversely affected. The water treatment plants are monitored remotely via a Supervisory Control and Data Acquisition (SCADA) system and are checked daily (Monday through Friday) by Municipal crews; each intake is checked at least weekly unless safe work procedures prohibit entry along the intake road.

⁹ M52 Water Conservation Programs - A Planning Manual, Second Edition

¹⁰ <https://www.lionsbay.ca/services/public-works/water-consumption-graph>

In times of severe weather, Municipal staff will increase the frequency of testing and adjust chlorine injection rates to compensate for any fluctuating chlorine demand caused by varying turbidity levels.

INTAKE BLOCKAGES

The watershed areas for the Municipality's raw water intakes are contained by steep, rocky, unstable terrain upslope on one side, and steep flowing creeks subject to debris torrents on the other. Access to the intakes is via narrow gravel roads that are subject to rock fall and tree throw hazards from above. Strict safe working guidelines for unstable terrain upslope prohibit crews from entering the watershed areas and water intakes if rainfall parameters are exceeded. This prevents crews from being able to investigate decreased water flow or increased raw water turbidity levels during periods of heavy rain – the exact times most likely to cause either event.

During a turbidity event, organic and inorganic debris flows down the creek channel and becomes trapped behind an intake weir at either of the two raw water intakes. This necessitates manual clearing efforts by staff. In 2020, the Municipality experienced one fifteen-day interruption due to a debris flow in the Magnesia Creek water system and three minor 1-2 day occurrences, also in the Magnesia Creek water system. There were no blockages in the Harvey Creek water system. During these outages, the residents of Municipality were supplied water from the Harvey Creek system.

Annual Work Programs

The Municipality's annual operating work program revolves around regulatory monitoring and reporting that is required in order to meet the *Drinking Water Protection Act* and the *Drinking Water Protection Regulation* requirements. The Core Service Level Review¹¹, available on the Municipality's web site details the routine tasks and staff resources involved with operating and maintaining the Municipal Water system.

The Municipal capital works program facilitates minor and major improvements and replacement of the water systems components. More often than not, capital upgrades are facilitated by grant funding opportunities.

2020 ACCOMPLISHMENTS

Core maintenance activities were completed on target for the 2020 calendar year. On the Capital front, the Municipality engaged engineers to design three new pressure-controlled stations to help with the transfer of water between the two drinking water catchments and to increase fire flows to the Lions Bay Community School. One of the key benefits to these stations is that they will enable the Municipality to eliminate two small ageing potable water tanks (Phase IV and Phase V) that are deteriorating and superfluous given the increased capacity of the new Harvey Tank.

¹¹ <https://www.lionsbay.ca/government/reports-documents-library/core-service-level-review>

2021 WORK PROGRAM

2021 is a more sedate year in terms of capital projects. The Municipality intends to complete the installation of the 3 pressure-controlled stations initiated in 2019 and will undertake the upgrades of the Harvey UV Reactors.

APPENDIX A – HARVEY AND MAGNESIA CREEK RAW WATER UVT RATES

Lions Bay Drinking Water Quality 2020 Annual Report

	Harvey			Magnesia		
	UVT (%)	NTU	24 Hr. Rain (mm)	UVT (%)	NTU	24 Hr. Rain (mm)
2-Jan-20	90.3	0.57	1.00	93.7	0.30	1.25
3-Jan-20	81.1	0.42	27.75	93.3	0.66	25.25
6-Jan-20	88.6	0.30	23.75	94.0	0.75	16.25
7-Jan-20	83.2	0.35	31.25	91.3	0.45	30.75
8-Jan-20	87.1	0.53	19.50	90.4	0.60	21.25
9-Jan-20	90.5	0.71	0.00	93.5	0.50	0.00
10-Jan-20	91.7	0.46	4.50	95.1	0.27	0.27
13-Jan-20	90.5	0.22	12.50	93.6	0.47	8.25
14-Jan-20	91.3	0.40	0.00	95.0	0.42	0.25
15-Jan-20	92.7	0.33	0.50	96.4	0.28	3.25
16-Jan-20	92.3	0.52	13.25	94.9	0.32	7.00
17-Jan-20	92.8	0.36	1.50	96.3	0.64	1.25
20-Jan-20	86.1	0.60	28.50	89.8	0.91	22.50
21-Jan-20	82.4	0.61	42.00	84.9	3.24	39.00
22-Jan-20	85.9	1.10	40.50	91.6	0.99	31.00
23-Jan-20	88.4	0.79	49.00	90.1	0.59	46.00
24-Jan-20	87.1	0.64	20.00	N/A	N/A	18.00
27-Jan-20	87.5	0.41	17.00	93.6	0.36	12.00
28-Jan-20	88.7	0.20	7.00	94.1	0.58	5.00
29-Jan-20	89.4	0.32	5.00	93.6	0.45	2.75
30-Jan-20	89.0	0.31	19.25	93.9	0.28	14.50
31-Jan-20	88.0	0.36	20.00	93.6	0.26	16.00
3-Feb-20	89.8	0.76	0.75	87.5	1.62	1.00
4-Feb-20	91.5	0.50	0.25	94.8	0.30	0.25
5-Feb-20	89.3	0.43	10.00	96.6	0.49	10.50
6-Feb-20	91.4	0.29	1.25	94.6	0.86	0.75
7-Feb-20	90.5	0.37	5.75	94.0	0.49	6.00
10-Feb-20	90.9	0.40	0.00	95.5	0.30	0.00
11-Feb-20	92.2	0.18	0.00	95.3	0.25	0.00
12-Feb-20	92.7	0.29	0.00	96.2	0.42	0.00
13-Feb-20	92.5	0.44	1.25	95.8	0.49	1.75
14-Feb-20	92.0	0.21	2.25	95.9	0.24	2.75
18-Feb-20	92.9	0.64	0.00	95.9	0.42	0.00
19-Feb-20	93.8	0.19	0.00	96.3	0.16	0.00
20-Feb-20	93.5	0.86	0.00	96.4	0.27	0.00
21-Feb-20	93.5	0.18	0.00	96.3	0.18	0.00
24-Feb-20	90.9	0.39	5.75	95.8	0.28	5.50
25-Feb-20	91.9	0.41	0.00	95.7	0.50	0.00
26-Feb-20	92.6	0.39	4.25	96.1	0.46	4.75
27-Feb-20	91.8	0.38	7.50	96.2	0.50	6.75
28-Feb-20	91.7	0.58	1.50	95.8	0.31	2.75
2-Mar-20	92.1	0.43	1.50	96.6	0.50	1.75
3-Mar-20	89.9	0.49	9.50	94.0	0.46	9.75
4-Mar-20	90.4	0.45	0.75	95.2	0.40	1.25

Lions Bay Drinking Water Quality 2020 Annual Report

	Harvey			Magnesia		
	UVT (%)	NTU	24 Hr. Rain (mm)	UVT (%)	NTU	24 Hr. Rain (mm)
5-Mar-20	91.7	0.24	0.00	95.4	0.32	0.00
6-Mar-20	91.1	0.22	7.75	96.0	0.27	7.50
9-Mar-20	92.8	0.19	0.00	96.1	0.30	0.00
10-Mar-20	92.8	0.25	0.00	96.2	0.38	0.00
11-Mar-20	93.1	0.31	11.25	95.9	0.46	11.75
12-Mar-20	92.7	0.32	0.00	96.4	0.26	0.00
13-Mar-20	93.9	0.16	0.00	97.0	0.28	0.00
16-Mar-20	94.2	0.22	0.00	96.3	0.19	0.00
17-Mar-20	94.4	0.22	0.00	97.2	0.26	0.00
18-Mar-20	94.7	0.32	0.00	97.2	0.28	0.00
19-Mar-20	94.5	0.40	0.00	97.2	0.36	0.00
20-Mar-20	94.1	0.17	0.00	97.5	0.17	0.00
23-Mar-20	93.5	0.32	2.75	97.0	0.53	2.25
24-Mar-20	93.9	0.19	4.75	96.5	0.23	4.75
25-Mar-20	93.1	0.26	1.75	97.0	0.20	0.25
26-Mar-20	93.6	0.21	0.00	97.3	0.19	0.00
27-Mar-20	93.9	0.22	6.25	96.5	0.32	7.50
30-Mar-20	78.9	0.43	31.25	89.9	0.47	27.25
31-Mar-20	89.7	0.28	0.25	95.9	0.23	0.50
1-Apr-20	91.8	0.21	0.00	95.9	0.19	0.00
2-Apr-20	92.4	0.21	0.50	96.5	0.17	1.50
3-Apr-20	93.8	0.23	0.23	96.7	0.19	0.19
6-Apr-20	91.2	0.69	0.00	95.6	0.33	0.00
7-Apr-20	93.9	0.21	0.00	97.4	0.20	0.00
8-Apr-20	93.8	0.37	0.00	97.3	0.21	0.00
9-Apr-20	93.5	0.33	0.00	97.4	0.15	0.00
10-Apr-20	91.5	0.29	0.00	96.7	0.21	0.00
14-Apr-20	92.7	0.45	0.00	96.5	0.27	0.00
15-Apr-20	91.1	0.24	0.00	95.8	0.20	0.00
16-Apr-20	90.1	0.45	0.00	95.3	0.20	0.00
17-Apr-20	90.1	0.31	0.00	94.8	0.20	0.00
20-Apr-20	88.5	0.49	0.00	93.4	0.20	0.00
21-Apr-20	89.3	0.22	0.00	93.3	0.24	0.00
22-Apr-20	89.3	0.26	2.25	93.8	0.27	2.25
23-Apr-20	89.2	0.36	6.50	93.4	0.23	7.00
24-Apr-20	89.5	0.32	0.25	93.7	0.46	1.00
27-Apr-20	87.5	0.63	12.50	92.6	0.39	10.50
28-Apr-20	88.7	0.28	1.00	93.4	0.23	0.75
29-Apr-20	89.4	0.68	0.50	94.0	0.63	0.75
30-Apr-20	88.1	0.50	8.25	92.4	0.29	0.29
1-May-20	90.1	0.45	2.25	93.2	0.24	1.25
4-May-20	90.1	0.40	0.25	92.3	0.65	0.00
5-May-20	88.0	0.65	10.50	93.2	0.30	12.75
6-May-20	86.1	0.34	7.00	92.1	0.36	7.25

Lions Bay Drinking Water Quality 2020 Annual Report

	Harvey			Magnesia		
	UVT (%)	NTU	24 Hr. Rain (mm)	UVT (%)	NTU	24 Hr. Rain (mm)
7-May-20	89.8	0.53	1.00	92.8	0.53	0.75
8-May-20	89.7	0.22	0.00	93.6	0.27	0.00
11-May-20	88.8	0.33	0.00	91.1	0.40	0.00
12-May-20	88.5	0.36	12.25	91.5	0.66	12.00
13-May-20	87.7	0.37	11.50	91.0	0.58	13.50
14-May-20	90.6	0.55	1.00	93.2	0.33	0.75
15-May-20	91.8	0.37	0.00	94.0	0.32	0.00
19-May-20	90.3	0.38	0.00	92.3	0.37	0.00
20-May-20	90.8	0.73	0.00	93.5	0.44	0.00
21-May-20	90.2	0.31	3.25	92.9	0.49	3.50
22-May-20	91.0	0.31	0.75	93.8	0.27	0.25
25-May-20	88.7	0.36	7.75	92.9	0.53	9.00
26-May-20	89.5	0.61	12.75	89.9	0.48	16.50
27-May-20	91.2	0.29	0.00	92.7	0.40	0.00
28-May-20	90.5	0.29	0.00	93.4	0.34	0.00
29-May-20	91.4	0.39	0.00	92.8	0.41	0.00
1-Jun-20	91.7	0.33	2.00	93.6	0.28	1.75
2-Jun-20	92.3	0.28	0.00	94.3	0.30	0.00
3-Jun-20	92.4	0.29	7.00	94.6	0.31	7.50
4-Jun-20	92.6	0.28	0.00	94.6	0.34	0.00
5-Jun-20	92.3	0.25	0.75	94.5	0.28	0.28
8-Jun-20	92.7	0.18	0.00	94.2	0.70	0.00
9-Jun-20	89.0	0.65	9.50	94.2	0.44	8.75
10-Jun-20	91.2	0.39	6.25	92.8	0.44	6.25
11-Jun-20	91.7	0.21	4.00	92.7	0.25	2.00
12-Jun-20	91.8	0.50	3.25	92.8	0.46	3.50
15-Jun-20	91.3	0.33	1.50	94.2	0.23	2.00
16-Jun-20	90.3	0.36	11.75	93.2	0.34	9.25
17-Jun-20	92.4	0.50	0.00	94.5	0.29	0.00
18-Jun-20	93.2	0.32	0.00	94.5	0.22	0.00
19-Jun-20	93.4	0.32	0.00	94.0	0.44	0.00
22-Jun-20	93.2	0.28	1.00	93.5	0.38	3.00
23-Jun-20	93.2	0.26	0.00	94.5	0.37	0.00
24-Jun-20	90.2	0.38	13.75	93.1	0.27	15.75
25-Jun-20	92.6	0.49	7.50	92.8	0.34	7.75
26-Jun-20	93.4	0.29	0.00	93.9	0.33	0.00
29-Jun-20	94.0	0.25	0.25	95.1	0.24	0.00
30-Jun-20	94.0	0.19	0.00	94.6	0.29	0.00
2-Jul-20	93.3	0.36	7.75	94.1	0.43	9.50
3-Jul-20	91.4	0.56	4.00	94.5	0.21	4.50
6-Jul-20	92.9	0.28	0.00	95.2	0.26	0.00
7-Jul-20	93.8	0.30	0.00	95.5	0.20	0.00
8-Jul-20	94.1	0.19	0.00	95.8	0.20	0.00
9-Jul-20	93.9	0.18	3.25	95.3	0.19	2.75
10-Jul-20	93.5	0.42	4.00	95.6	0.17	3.75

Lions Bay Drinking Water Quality 2020 Annual Report

	Harvey			Magnesia		
	UVT (%)	NTU	24 Hr. Rain (mm)	UVT (%)	NTU	24 Hr. Rain (mm)
13-Jul-20	94.5	0.19	0.00	95.8	0.19	0.00
14-Jul-20	93.6	0.26	0.00	95.9	0.24	0.00
15-Jul-20	94.7	0.33	0.00	96.1	0.33	0.00
16-Jul-20	94.7	0.47	0.00	96.2	0.32	0.00
17-Jul-20	94.4	0.30	0.00	96.1	0.27	0.00
20-Jul-20	94.7	0.30	0.00	89.3	4.76	0.00
21-Jul-20	94.7	0.25	0.00	95.8	2.36	0.00
22-Jul-20	95.4	0.25	0.00	96.2	0.34	0.00
23-Jul-20	95.4	0.26	0.00	96.3	0.22	0.00
24-Jul-20	94.9	0.19	0.00	96.2	0.13	0.00
27-Jul-20	95.0	0.16	0.00	96.2	0.19	0.00
28-Jul-20	94.4	0.32	0.00	96.1	0.20	0.00
29-Jul-20	95.2	0.17	0.00	96.3	0.25	0.00
30-Jul-20	95.5	0.30	0.00	96.3	0.22	0.00
31-Jul-20	95.9	0.42	0.00	96.5	0.34	0.00
4-Aug-20	95.6	0.34	0.00	96.5	0.25	0.00
5-Aug-20	95.5	0.18	0.00	96.6	0.17	0.00
6-Aug-20	84.2	0.31	15.75	92.3	0.56	10.75
7-Aug-20	91.6	0.22	31.75	95.7	0.35	26.75
10-Aug-20	93.7	0.32	0.00	95.7	0.22	0.00
11-Aug-20	94.6	0.27	0.00	96.2	0.15	0.00
12-Aug-20	94.9	0.21	0.00	96.5	0.16	0.00
13-Aug-20	95.1	0.18	0.00	96.4	0.14	0.00
14-Aug-20	95.1	0.27	0.00	96.4	0.27	0.00
17-Aug-20	94.8	0.22	0.50	96.1	0.22	0.25
18-Aug-20	94.7	0.34	0.00	96.3	0.36	0.00
19-Aug-20	95.1	0.22	0.00	96.3	0.30	0.00
20-Aug-20	93.4	0.67	13.75	93.4	0.61	13.75
21-Aug-20	80.8	0.68	25.50	90.0	0.48	22.00
24-Aug-20	91.8	0.29	0.25	93.3	0.69	0.50
25-Aug-20	92.4	0.46	0.46	94.9	0.19	0.00
26-Aug-20	93.2	0.60	0.00	95.2	0.19	0.00
27-Aug-20	93.4	0.26	0.00	95.6	0.24	0.00
28-Aug-20	93.7	1.03	0.00	95.9	0.24	0.00
31-Aug-20	94.6	0.18	3.50	96.2	0.25	2.50
1-Sep-20	94.7	0.20	0.00	96.4	0.34	0.00
2-Sep-20	94.2	0.30	0.00	96.0	0.24	0.00
3-Sep-20	94.3	0.28	0.00	96.0	0.34	0.00
4-Sep-20	94.7	0.29	0.00	95.8	0.27	0.00
8-Sep-20	94.8	0.16	0.00	96.1	0.32	0.00
9-Sep-20	95.1	0.23	0.00	96.4	0.16	0.00
10-Sep-20	95.1	0.22	0.00	96.5	0.21	0.00
11-Sep-20	95.1	0.14	0.00	96.3	0.21	0.00
14-Sep-20	95.1	0.21	0.00	96.8	0.41	0.00
15-Sep-20	95.2	0.19	1.25	96.6	0.34	0.75

Lions Bay Drinking Water Quality 2020 Annual Report

	Harvey			Magnesia		
	UVT (%)	NTU	24 Hr. Rain (mm)	UVT (%)	NTU	24 Hr. Rain (mm)
16-Sep-20	94.8	0.25	0.75	96.5	0.17	0.75
17-Sep-20	95.1	0.28	0.00	96.6	0.26	0.00
18-Sep-20	95.3	0.18	0.00	96.5	0.19	0.00
21-Sep-20	93.1	0.32	0.00	95.1	0.24	0.00
22-Sep-20	93.2	0.25	4.25	95.9	0.21	3.50
23-Sep-20	74.6	1.55	15.00	89.5	0.93	N/A
24-Sep-20	87.5	0.52	37.25	89.2	0.36	42.50
25-Sep-20	78.4	2.20	32.75	76.4	5.19	27.75
28-Sep-20	91.2	0.38	0.00	94.0	0.48	0.00
29-Sep-20	92.2	0.25	0.00	94.9	0.48	0.00
30-Sep-20	92.7	0.64	0.00	95.3	0.35	0.00
1-Oct-20	93.1	0.24	0.00	95.5	0.19	0.00
2-Oct-20	94.5	0.30	0.00	95.8	0.40	0.00
5-Oct-20	93.7	0.37	1.25	95.9	0.34	2.50
6-Oct-20	94.3	0.28	0.25	96.3	0.29	0.00
7-Oct-20	94.1	0.15	0.00	95.8	0.21	0.00
8-Oct-20	94.1	0.16	0.00	96.0	0.25	0.00
9-Oct-20	94.1	0.58	1.25	95.7	0.48	1.50
13-Oct-20	75.5	0.88	18.50	89.4	0.55	17.00
14-Oct-20	88.2	0.31	7.50	91.7	0.44	5.75
15-Oct-20	90.5	0.41	0.00	93.4	0.37	0.00
16-Oct-20	89.7	0.26	4.75	93.9	0.44	7.00
19-Oct-20	90.2	0.29	0.50	93.4	0.44	1.25
20-Oct-20	91.3	0.41	0.00	94.3	0.41	0.00
21-Oct-20	92.1	0.39	0.00	94.7	0.57	0.00
22-Oct-20	90.9	0.20	0.00	94.2	0.31	0.00
23-Oct-20	91.9	0.48	3.50	95.0	0.30	3.25
26-Oct-20	93.2	0.26	1.00	95.8	0.31	0.75
27-Oct-20	92.6	0.24	0.00	95.9	0.40	0.00
28-Oct-20	89.6	0.28	0.75	95.3	0.59	1.00
29-Oct-20	91.1	0.55	0.00	94.9	0.55	0.00
30-Oct-20	87.6	0.40	10.25	92.6	0.58	10.75
2-Nov-20	93.0	0.32	0.00	94.9	0.20	0.00
3-Nov-20	76.9	0.48	26.75	90.4	0.84	28.00
4-Nov-20	84.9	0.65	42.50	86.5	0.45	45.25
5-Nov-20	88.1	1.51	11.25	89.7	0.42	10.25
6-Nov-20	90.7	0.21	0.00	92.5	0.21	0.25
9-Nov-20	92.5	0.17	0.00	95.6	0.35	0.35
10-Nov-20	92.9	0.43	0.50	95.6	0.44	7.50
12-Nov-20	93.2	0.21	3.25	95.3	0.18	0.00
13-Nov-20	76.4	0.28	43.75	93.5	0.27	31.50
16-Nov-20	90.1	0.34	0.25	96.3	0.35	0.25
17-Nov-20	84.1	0.58	27.50	92.3	0.55	23.00
18-Nov-20	89.0	0.69	18.00	89.4	0.83	14.50

	Harvey			Magnesia		
	UVT (%)	NTU	24 Hr. Rain (mm)	UVT (%)	NTU	24 Hr. Rain (mm)
19-Nov-20	88.6	0.67	23.75	92.0	0.86	25.75
20-Nov-20	90.4	0.42	7.50	94.1	0.29	9.75
23-Nov-20	92.1	0.56	5.25	96.2	0.46	5.50
24-Nov-20	91.8	0.79	1.75	95.2	0.38	1.25
25-Nov-20	88.7	0.43	15.25	87.3	0.54	12.00
26-Nov-20	91.3	0.48	0.00	95.9	0.30	0.00
27-Nov-20	92.7	0.57	2.50	96.0	0.41	2.75
30-Nov-20	84.4	0.55	20.00	93.9	0.84	13.25
1-Dec-20	90.4	0.75	2.00	95.9	0.31	3.50
2-Dec-20	92.5	0.27	0.25	96.0	0.22	0.00
3-Dec-20	92.2	0.22	0.00	96.3	0.18	0.00
4-Dec-20	92.7	0.36	0.00	96.3	0.36	0.00
7-Dec-20	88.3	0.27	3.75	95.5	0.37	3.50
8-Dec-20	85.7	0.69	45.75	85.5	1.85	53.75
9-Dec-20	89.9	0.45	13.50	90.4	1.45	16.00
10-Dec-20	91.2	0.46	4.50	92.7	0.62	5.75
11-Dec-20	91.9	0.85	7.25	94.9	1.06	5.75
14-Dec-20	91.9	0.23	11.75	95.0	0.29	11.00
15-Dec-20	84.6	0.60	11.00	95.1	0.39	7.75
16-Dec-20	89.6	0.26	5.00	95.5	0.41	0.41
17-Dec-20	82.2	0.48	39.00	91.6	0.36	32.75
18-Dec-20	88.2	0.72	9.25	93.9	0.53	9.50
21-Dec-20	90.3	0.96	4.00	94.9	0.49	5.00
22-Dec-20	91.7	0.40	21.75	95.7	0.24	21.00
23-Dec-20	92.1	0.18	3.00	96.2	0.23	3.00
24-Dec-20	93.1	0.32	0.00	96.2	0.20	0.00
28-Dec-20	92.3	0.43	11.50	95.7	0.39	10.25
29-Dec-20	91.7	0.23	0.00	95.5	0.32	0.00
30-Dec-20	80.9	0.52	25.25	95.2	0.34	23.75
31-Dec-20	82.7	0.37	48.75	92.9	0.56	33.50

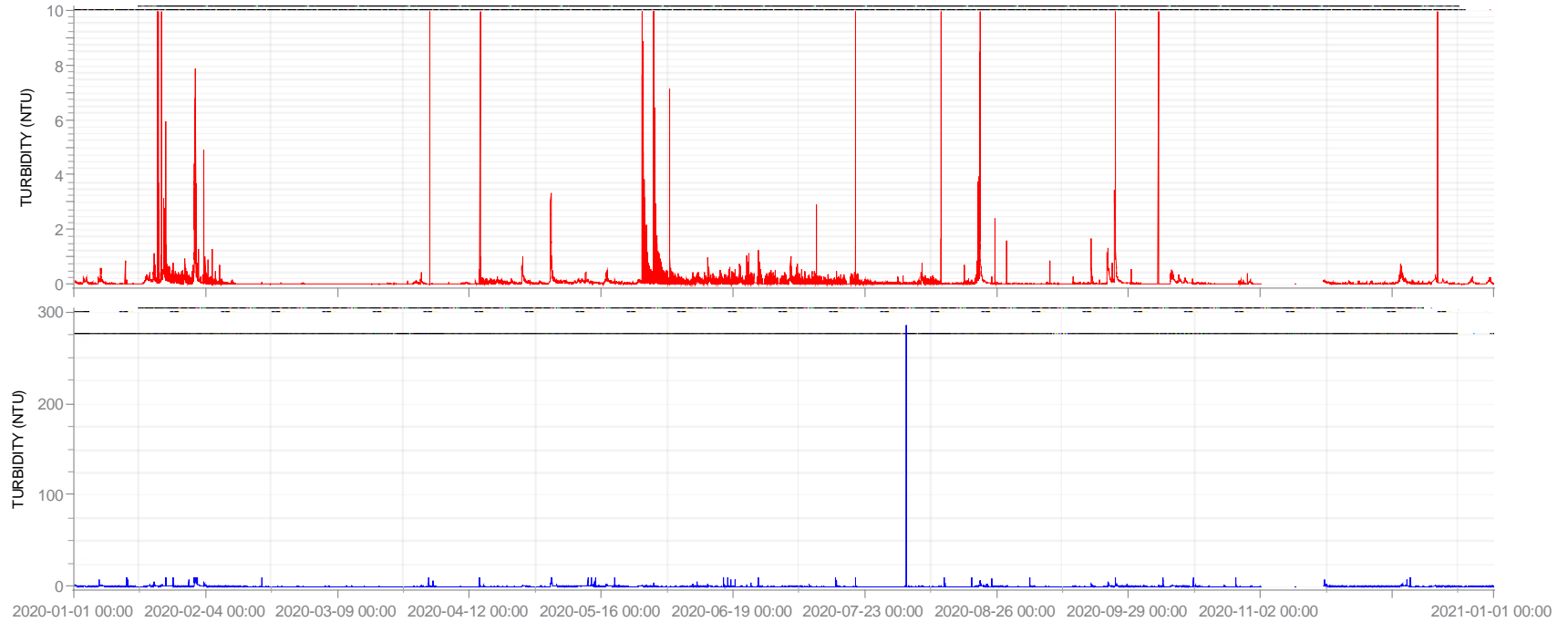
APPENDIX B – HARVEY AND MAGNESIA RAW WATER TURBIDITY GRAPH

Harvey Reservoir / Magnesia Reservoir

Start Date: 2020-01-01 00:00

End Date: 2020-12-31 23:59

■ Harvey Reservoir / HARV_TURBIDITY (NTU) ■ Magnesia Reservoir / MAG_TURBIDITY (NTU)



	Harvey Reservoir / HARV_TURBIDITY (NTU)	Magnesia Reservoir / MAG_TURBIDITY (NTU)
Min	0	0
Avg	0.08506	0.1496
Max	10	286.8

APPENDIX C – SAMPLE STATIONS AND TESTS

Table 6. Harvey Creek Water System Sampling Stations

Sampling Location	Type	Free Chlorine	Turbidity	Bacteriological	Metals & Chemical
Harvey Creek Intake	Raw Water	N/A	Daily	Monthly	Biannual
Harvey Tank	Treated Water	Daily	Daily	Weekly	Biannual
PRV-3	Treated Water	Daily	Daily	Weekly	N/A
Lions Bay Café	Treated Water	Daily	Daily	Weekly	Biannual
Lions Bay Avenue	Treated Water	Daily	Daily	Weekly	Biannual
Kelvin Grove	Treated Water	Daily	Daily	Weekly	Biannual
Harvey UV Reactor	Treated Water	N/A	N/A	Monthly	N/A
Community Centre	Treated Water	N/A	N/A	N/A	Biannual

Table 7. Magnesia Creek Water System Sampling Stations

Sampling Location	Type	Free Chlorine	Turbidity	Bacteriological	Metals & Chemical
Magnesia Creek Intake	Raw Water	N/A	Daily	Monthly	Biannual
Magnesia Tank	Treated Water	Daily	Daily	Weekly	Biannual
PRV-5	Treated Water	Daily	Daily	Weekly	N/A
Brunswick Beach	Treated Water	Daily	Daily	Weekly	Biannual
Magnesia UV Reactor	Treated Water	N/A	N/A	Monthly	N/A

Note: Daily samples are taken Monday to Friday not including weekends and statutory holidays.

Additionally, on April 16, 2018, raw water bacteriological testing at both intakes was increased from monthly to weekly sampling.

APPENDIX D – RESPONSE TO POTENTIAL CONTAMINATION

Table 9 below outlines the notification protocol for unusual situations that could potentially affect the Municipality's potable water system.

Table 8. Notification of Unusual Situations Potentially Affecting Water Quality

Situation	Notifying Agency	Agency Notified	Notification Time Frame
E. coli – positive sample	VCH Labs	VOLB & VCH	Immediate
Total coliform >10/100 ml & low chlorine residual	VOLB	VCH	Immediate
Chemical contamination	VOLB	VCH	Immediate
Turbidity events >5 NTU	VOLB	VCH	Immediate
Disinfection failures/continued loss of residual	VOLB	VCH	Immediate for continued loss of residual
Loss of pressure due to high demand	VOLB	VCH	Immediate
Water main breaks	VOLB	VCH	Immediate
Lack of water due to drought or other causes	VOLB	EMBC & VCH	Information only; as drought situation progresses

E. COLI POSITIVE SAMPLES

Any interim samples (samples that have been taken in the period between the time the E. coli sample was first drawn and when the laboratory determined it to be positive) that have been taken from the same sampling station will be immediately examined by the laboratory.

The chlorine residual noted on the Water Operator's field sheet will be reviewed by the laboratory and compared to previous test results to determine if there is any localized loss of disinfectant residual.

The Public Works Manager (or designate) and VCH will be notified immediately by the laboratory.

Arrangements will be made for the immediate collection of a repeat sample, and, where possible, both upstream and downstream of the E. coli positive sample location.

VCH and the Public Works Manager (or designate) will liaise and determine the need for a Boil Water Advisory (BWA) to be issued. If it is determined to be warranted, VCH will issue the BWA.

The laboratory will continue to test the subsequent samples. Once consecutive negative sample results are returned, the Public Works Manager (or designate) will liaise again with VCH and determine whether the BWA can be lifted.

CHEMICAL CONTAMINATION

Chemical contamination of the water supply may include such items as nitrogen, salts, pesticides, metals, toxins, etc. The Municipality recognizes that detection of some chemical contaminants is difficult. In the event of chemical contamination to the Municipality's water supply or distribution system, VCH will

immediately be notified, and steps will commence to isolate the contaminated area. The level of contamination will be determined through water sampling and analysis; identified and any public health risk factors associated with the chemical presence and level will be determined. A public advisory will be issued and carried out by the Public Works Manager (or designate) under the guidance of VCH. Once the contamination is remedied and consecutive negative sample results are returned from the laboratory, the Public Works Manager (or designate) will again liaise with VCH and determine whether the public advisory can be lifted.

TURBIDITY EVENTS

Turbidity in the Municipality's treated water system is monitored on a regular basis through the water sampling and local analysis program. Water sample turbidity results that register >1 - 3 NTU are scrutinized, along with corresponding chlorine residual levels, and actively monitored. Any sections of the water distribution system generating high turbidity results are field-checked and flushed if required.

Turbidity events in the raw source water affect the Municipality's water treatment plants. The performance of the primary UV treatment is affected by increased turbidity because water that has higher turbidity absorbs a significant amount of UV light, and will therefore have a correspondingly low UV transmittance (UVT) rate. The UV system automatically increases lamp intensity to counter the lower UVT. Once the UVT drops below the minimum set point of 26.25 mJ/cm², the UV reactors shut down and an alarm signal is sent via SCADA to municipal on-call staff. Municipal staff will immediately inform the Public Works Manager (or designate) and investigate the alarm at the plant.

During turbidity events in excess of 5 NTU in the distribution system, microbiological sampling and testing is increased at all sampling locations; chlorine residual sampling and testing is likewise increased; and the Municipality will contact VCH, who may issue a Boil Water Advisory.

DISINFECTION FAILURES

Chlorine residuals in the Municipality's treated water system are monitored on a regular basis through the water sampling and local analysis program. If a daily sample registers below the generally accepted minimum chlorine residual of 0.2 ppm, the Water Operator will first flush water through the system to attempt to bring the chlorine residual up to the minimum required. Should the chlorine residual continue to be below the minimum level, the Municipality will immediately commence increased monitoring of all chlorine residuals in the system, including the storage tanks, and determine the root cause of the problem. Chlorine will be added manually to the storage reservoirs if necessary; and residuals checked frequently at all locations. The Public Works Manager (or designate) will contact VCH, who may issue a Boil Water Advisory if continued loss of residual is observed.

LOSS OF PRESSURE DUE TO HIGH DEMAND

In the event of adverse pressure loss due to high demand, Municipal crews will adjust the system to isolate the affected section, and then take effective measures to supplement pressure in the affected area. The Public Works Manager (or designate) will immediately consult with VCH regarding further actions; all water

quality complaints from the public will be immediately and thoroughly investigated for potential contamination.

WATER MAIN BREAKS

In the event of a water main break where chemical or microbiological contamination of the system is suspected, Municipal crews will adjust the system to isolate the contaminated section from the rest of the distribution system. The Public Works Manager (or designate) will immediately consult with VCH regarding further actions; all water quality complaints from the public will be immediately and thoroughly investigated for potential contamination. Water samples will be taken from the vicinity and downstream of the break if possible, and tested for the suspected contamination. The same procedures as noted under E. coli positive samples above will be implemented if required.

LACK OF WATER DUE TO DROUGHT OR OTHER CAUSES

In the event of a lack of water due to low streamflow or other causes affecting supply (such as debris torrents, lack of safe access to intakes, or Municipality-wide water use in excess of supply), an escalating conservation system is implemented to address the lack of water in the system.

Conservation efforts now commence annually from June 1 through to September 30 of each year, in accordance with Level 1 of the Municipality's Outdoor Water Use Bylaw. Further stages of conservation are then utilized as required to reduce the outdoor use of water in the Municipality, combined with extensive public notification (via electronic notifications, printed media delivered to every home, and town hall meetings). The highest levels of restrictions are intended for emergent situations that directly affect the supply of water in the system.

The flow rate of raw water entering the creek intakes to their respective water treatment plants is monitored daily, during the water sampling and testing program. If the water flow entering either plant is compromised, Municipal crews ascertain the root cause of the problem (i.e. whether the decrease is due to a blockage or drought) and work to either repair (if blocked) and/or mitigate the impact on the system as a whole by implementing conservation measures noted in Table 10 below.

When a lack of water continues despite conservation efforts, Municipal staff will liaise with EMBC, VCH, and FLNRO for both information and a consolidated response to events as they unfold. Municipal staff will then arrange for water tankers to truck in potable water and use this method to fill one or both tanks to keep potable water in the water system. Neighboring municipalities will also be informed in the event they can lend assistance. Increased testing and monitoring of the water system is undertaken in conjunction with VCH, until the system as a whole is once again restored.

Table 9. Outdoor Water Use Conservation Levels

	ACTIVITY	CONSERVATION LEVEL 1	CONSERVATION LEVEL 2	CONSERVATION LEVEL 3
RESIDENTIAL & COMMERCIAL USES	Watering lawns, 4 am – 9 am only	Even-numbered addresses: Monday, Wednesday and Saturday.	Even-numbered addresses: Monday only	Prohibited
	Newly planted lawns may be watered outside allowed times with a municipal permit displayed	Odd-numbered addresses: Tuesday, Thursday and Sunday.	Odd-numbered addresses: Thursday only	
	Watering flowers, vegetables, planters, shrubs, trees	No restrictions	Only by hand using spring-loaded nozzle, containers, or drip irrigation. Sprinklers and soaker hoses prohibited	Prohibited
	Use of pools, spas, fountains/ponds	No restrictions. Must have a recirculation pump. "One-time-through" uses are prohibited at all times		Filling prohibited
	Washing outdoor impermeable surfaces such as driveways, buildings, sidewalks and roads, including pressure washing	No restrictions	Only for health and safety purposes, or to prepare a surface for painting or similar treatment	Prohibited
	Washing vehicles and boats	Only with a hose using spring-loaded shut off	Only by bucket	Prohibited, except for windows, lights, and license plates
	Flushing boat engines	No restrictions		4 minutes maximum
	Filling outdoor water storage	No restrictions		Prohibited
PUBLIC USES	Watering of school property, including Lions Bay Field	No restrictions	Minimum to maintain in useable condition	Prohibited
	Watering of parks, municipal lawns, and grassed boulevards 1 am to 6 am only	Even-numbered addresses: Monday and Wednesday. Odd-numbered addresses: Tuesday and Thursday. Parks Friday only	Even-numbered addresses: Monday only Odd-numbered addresses: Thursday only	Prohibited
	Flushing of water mains and hydrants	Only for safety or public health reasons		

APPENDIX E – TREATED WATER TURBIDITY AND CHLORINE RESIDUAL READINGS

For the following table, NTU represents treated water turbidity and CL² represents chlorine residual in parts per million.

	HARVEY CREEK SYSTEM								MAGNESIA CREEK SYSTEM							
	HARVEY TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		MAGNESIA TANK		PRV-5		BRUNSWICK.	
	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²
02 Jan 2020	1.13	0.97	0.55	0.97	0.54	0.39	0.13	0.59	0.16	0.35	0.69	0.88	0.54	0.79	0.39	0.53
03 Jan 2020	1.63	1.21	0.69	1.15	0.57	0.53	0.29	0.54	0.40	0.47	0.78	1.00	0.46	0.94	1.15	0.57
06 Jan 2020	1.55	0.98	0.45	0.96	0.69	0.57	0.21	0.71	0.23	0.48	0.31	0.96	0.40	0.88	0.20	0.49
07 Jan 2020	0.82	0.90	0.23	0.87	0.31	0.57	0.30	0.70	0.23	0.59	0.40	0.86	0.29	0.83	0.22	0.55
08 Jan 2020	1.93	0.73	0.85	0.73	0.45	0.38	0.54	0.66	0.26	0.48	0.81	0.72	0.62	0.67	0.38	0.53
09 Jan 2020	1.66	0.82	0.76	0.72	0.45	0.27	0.52	0.53	0.32	0.41	0.61	0.72	0.59	0.68	0.25	0.59
10 Jan 2020	1.09	1.00	0.58	0.86	0.58	0.47	0.34	0.43	0.31	0.39	0.50	0.89	0.33	0.78	0.36	0.42
13 Jan 2020	0.79	0.86	0.72	0.89	0.63	0.51	0.54	0.65	0.36	0.41	0.33	1.02	0.40	0.97	0.35	0.44
14 Jan 2020	1.11	0.87	0.89	0.89	1.35	0.25	1.05	0.68	0.19	0.54	0.48	1.07	0.42	1.06	0.31	0.63
15 Jan 2020	0.49	0.87	1.09	0.88	0.94	0.59	1.78	0.63	0.26	0.53	0.62	0.94	0.55	0.92	0.52	0.90
16 Jan 2020	0.94	0.89	1.02	0.85	0.88	0.42	0.39	0.66	0.29	0.62	0.75	0.92	0.42	0.86	0.41	0.84
17 Jan 2020	1.74	0.93	0.45	0.89	0.76	0.54	0.27	0.68	0.31	0.60	0.74	0.86	0.83	0.83	0.37	0.82
20 Jan 2020	2.45	0.68	1.12	0.60	1.06	0.50	0.80	0.72	0.42	0.58	0.61	0.79	0.38	0.77	0.42	0.72
21 Jan 2020	1.27	0.83	0.65	0.79	0.65	0.31	0.39	0.54	0.35	0.48	0.84	0.81	0.64	0.63	0.42	0.67
22 Jan 2020	0.91	0.92	0.56	0.78	1.25	0.47	0.68	0.40	0.39	0.21	1.23	0.82	0.47	0.66	0.41	0.52
23 Jan 2020	0.34	0.98	0.35	0.89	0.27	0.55	0.28	0.40	0.26	0.43	0.47	1.02	0.39	0.90	0.37	0.48
24 Jan 2020	0.86	0.99	0.78	0.99	0.62	0.54	0.49	0.53	0.39	0.53	0.68	1.02	0.53	0.94	0.49	0.71
27 Jan 2020	1.16	1.02	0.52	0.96	0.49	0.66	0.57	0.66	0.55	0.51	0.69	1.16	0.84	0.92	0.43	0.57
28 Jan 2020	1.22	0.93	1.80	0.91	0.62	0.60	0.44	0.74	0.39	0.77	0.60	1.40	0.22	0.85	0.26	0.64
29 Jan 2020	0.90	0.92	0.63	0.90	0.44	0.54	0.48	0.66	0.26	0.51	0.50	1.30	0.36	0.89	0.34	0.54
30 Jan 2020	1.02	0.81	0.40	0.78	0.23	0.39	0.26	0.64	0.37	0.48	0.32	1.04	0.21	0.73	0.18	0.57
31 Jan 2020	0.65	0.85	0.59	0.80	0.50	0.48	0.29	0.55	0.27	0.40	0.33	0.92	0.23	0.71	0.17	0.48
03 Feb 2020	1.33	1.02	0.69	0.97	0.85	0.62	0.37	0.35	0.37	0.26	1.48	0.78	0.52	0.91	0.23	0.42
04 Feb 2020	1.44	0.93	0.62	0.97	0.59	0.55	0.49	0.59	0.53	0.57	1.54	0.97	0.54	0.96	0.35	0.37
05 Feb 2020	1.77	1.05	0.69	0.96	0.36	0.55	0.43	0.71	0.29	0.57	0.92	1.01	1.08	0.92	0.50	0.45
06 Feb 2020	0.62	0.90	0.67	0.88	0.39	0.56	0.31	0.76	0.27	0.65	1.46	1.05	0.43	0.85	0.88	0.56
07 Feb 2020	0.91	0.87	0.67	0.83	0.68	0.51	0.38	0.75	0.19	0.65	0.95	1.09	1.19	1.01	0.42	0.54

Lions Bay Drinking Water Quality 2020 Annual Report

	HARVEY CREEK SYSTEM										MAGNESIA CREEK SYSTEM					
	HARVEY TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		MAGNESIA TANK		PRV-5		BRUNSWICK.	
	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²
10 Feb 2020	1.11	0.81	0.44	0.78	0.51	0.45	0.32	0.57	0.16	0.39	0.42	1.06	0.39	0.97	0.49	0.76
11 Feb 2020	0.85	0.85	0.32	0.83	0.35	0.55	0.18	0.56	0.18	0.49	0.38	1.04	0.27	1.00	0.52	0.80
12 Feb 2020	0.84	0.88	0.53	0.93	0.67	0.59	0.35	0.66	0.19	0.51	0.44	0.98	0.45	0.95	0.43	0.76
13 Feb 2020	0.86	0.91	0.65	0.92	0.61	0.63	1.00	0.76	0.29	0.68	0.63	0.93	0.30	0.92	0.29	0.82
14 Feb 2020	0.78	1.06	0.39	0.94	0.46	0.56	0.20	0.75	0.19	0.74	0.36	0.89	0.49	0.84	0.49	0.97
18 Feb 2020	0.80	0.78	0.27	0.80	0.49	0.50	0.42	0.65	0.98	0.56	0.52	0.78	0.28	0.80	0.29	0.60
19 Feb 2020	0.72	0.84	0.22	0.81	0.49	0.53	0.16	0.64	0.25	0.59	0.26	0.81	0.22	0.76	0.32	0.59
20 Feb 2020	0.92	0.90	0.37	0.84	0.47	0.57	0.23	0.65	0.22	0.62	0.31	0.81	0.31	0.75	0.28	0.64
21 Feb 2020	0.60	0.87	0.24	0.86	0.53	0.59	0.29	0.65	0.17	0.64	0.20	0.82	0.18	0.79	0.29	0.61
24 Feb 2020	0.64	0.84	0.44	0.80	0.55	0.56	0.13	0.69	0.24	0.57	0.47	0.84	0.42	0.82	0.51	0.56
25 Feb 2020	0.95	0.85	0.76	0.81	0.61	0.55	0.25	0.70	0.13	0.72	0.32	0.92	0.44	0.86	0.27	0.64
26 Feb 2020	0.97	0.88	0.56	0.90	0.72	0.56	0.38	0.64	0.14	0.59	0.69	0.93	0.48	0.87	0.34	0.63
27 Feb 2020	0.71	0.89	0.35	0.86	0.61	0.60	0.21	0.70	0.28	0.61	0.31	0.92	0.30	0.88	0.34	0.67
28 Feb 2020	0.99	0.90	0.39	0.85	0.39	0.63	0.28	0.72	0.14	0.70	0.41	0.98	0.33	0.94	0.27	0.72
02 Mar 2020	0.92	0.82	0.50	0.78	0.60	0.51	0.19	0.62	0.19	0.49	0.40	0.81	0.28	0.79	0.32	0.65
03 Mar 2020	0.83	0.87	0.46	0.83	0.53	0.60	0.38	0.61	0.13	0.57	0.38	0.76	0.39	0.72	0.54	0.68
04 Mar 2020	0.98	0.88	0.46	0.87	0.50	0.59	0.40	0.66	0.31	0.57	0.36	0.77	0.35	0.72	0.37	0.66
05 Mar 2020	0.83	0.88	0.72	0.89	0.32	0.74	0.37	0.36	0.15	0.66	0.31	0.87	0.33	0.85	0.24	0.58
06 Mar 2020	0.90	1.01	0.49	0.94	0.56	0.65	0.28	0.38	0.16	0.58	0.28	0.93	0.59	0.85	0.23	0.58
09 Mar 2020	1.03	0.91	0.36	0.85	0.41	0.59	0.15	0.52	0.14	0.53	0.19	0.93	0.35	0.91	0.27	0.62
10 Mar 2020	0.80	0.90	0.57	0.88	0.66	0.61	0.41	0.49	0.12	0.66	0.32	1.01	0.25	0.95	0.20	0.79
11 Mar 2020	0.98	0.85	0.73	0.87	0.66	0.64	0.39	0.44	0.34	0.76	1.04	0.99	0.54	0.97	0.45	0.82
12 Mar 2020	1.11	0.85	0.76	0.82	0.45	0.62	0.31	0.40	0.14	0.70	0.85	0.92	0.27	0.85	0.29	0.86
13 Mar 2020	1.00	0.84	0.32	0.81	0.28	0.56	0.21	0.38	0.15	0.65	0.15	0.91	0.28	0.86	0.18	0.83
16 Mar 2020	1.72	0.80	0.54	0.81	0.42	0.56	0.22	0.42	0.16	0.59	0.37	0.79	0.20	0.74	0.30	0.67
17 Mar 2020	0.85	0.86	0.47	0.82	0.16	0.73	0.45	0.39	0.20	0.67	0.35	0.72	0.41	0.68	0.28	0.65
18 Mar 2020	1.27	0.86	0.37	0.88	0.74	0.65	0.28	0.33	0.24	0.74	0.36	0.80	0.30	0.73	0.32	0.63

Lions Bay Drinking Water Quality 2020 Annual Report

	HARVEY CREEK SYSTEM										MAGNESIA CREEK SYSTEM					
	HARVEY TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		MAGNESIA TANK		PRV-5		BRUNSWICK.	
	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²
19 Mar 2020	1.16	0.88	0.50	0.88	0.78	0.60	0.20	0.34	0.19	0.78	1.41	0.85	0.29	0.86	0.31	0.59
20 Mar 2020	0.51	0.89	0.44	0.87	0.41	0.65	0.49	0.30	0.15	0.78	0.34	0.89	0.15	0.66	0.33	0.67
23 Mar 2020	1.02	0.83	0.29	0.81	0.52	0.58	0.26	0.58	0.60	0.67	0.40	0.86	0.24	0.83	0.20	0.72
24 Mar 2020	0.73	0.84	0.37	0.85	0.40	0.55	0.18	0.57	0.40	0.65	0.27	0.91	0.22	0.87	0.23	0.71
25 Mar 2020	1.02	0.84	0.33	0.84	0.30	0.53	0.14	0.50	0.13	0.63	0.23	0.93	0.28	0.87	0.24	0.69
26 Mar 2020	1.14	0.83	0.27	0.78	0.30	0.54	0.18	0.53	0.37	0.69	0.20	0.89	0.65	0.88	0.23	0.75
27 Mar 2020	0.60	0.87	0.42	0.85	0.23	0.57	0.19	0.53	0.27	0.74	0.14	0.89	0.15	0.81	0.29	0.77
30 Mar 2020	1.43	0.78	0.19	0.73	0.21	0.77	0.19	0.36	0.24	0.51	0.38	0.80	0.18	0.75	0.32	0.66
31 Mar 2020	1.86	0.85	0.81	0.79	0.33	0.34	0.24	0.41	0.44	0.46	0.36	0.75	0.34	0.66	0.64	0.62
01 Apr 2020	0.84	0.94	0.41	0.90	0.53	0.46	0.35	0.39	0.19	0.37	0.44	0.94	0.19	0.92	0.28	0.67
02 Apr 2020	0.75	1.04	0.26	0.95	0.19	0.60	0.16	0.39	0.24	0.46	0.26	0.99	0.48	0.88	0.65	0.56
03 Apr 2020	0.44	0.99	0.53	0.96	0.23	0.65	0.15	0.26	0.22	0.73	0.29	0.95	0.25	0.93	0.27	0.70
06 Apr 2020	1.31	0.92	0.61	0.91	0.48	0.60	0.65	0.48	0.28	0.65	0.24	0.89	0.32	0.89	0.43	0.68
07 Apr 2020	0.38	0.94	0.25	0.92	0.42	0.65	0.54	0.88	0.23	0.95	0.21	0.92	0.26	0.86	0.44	0.69
08 Apr 2020	0.48	0.88	0.25	0.89	0.33	0.65	0.49	0.74	0.19	0.79	0.15	0.93	0.17	0.91	0.35	0.70
09 Apr 2020	1.58	0.84	0.32	0.85	0.21	0.64	0.44	0.65	0.15	0.75	0.29	0.91	0.21	0.84	0.26	0.75
10 Apr 2020	1.03	0.78	1.14	0.80	0.35	0.54	0.41	0.58	0.18	0.63	0.33	0.84	0.29	0.82	0.38	0.75
14 Apr 2020	1.17	0.88	0.22	0.84	0.32	0.51	0.14	0.39	0.18	0.29	0.31	0.89	0.27	0.81	0.35	0.67
15 Apr 2020	0.49	0.86	0.19	0.84	0.17	0.54	0.17	0.42	0.16	0.63	0.15	0.8	0.28	0.85	0.28	0.65
16 Apr 2020	0.82	0.78	0.22	0.76	0.16	0.51	0.19	0.48	0.69	0.62	0.17	0.77	0.17	0.71	0.21	0.65
17 Apr 2020	1.38	0.81	0.46	0.75	0.27	0.49	0.24	0.51	0.17	0.62	0.22	0.77	0.20	0.74	0.27	0.66
20 Apr 2020	0.55	0.74	0.42	0.71	0.18	0.41	0.23	0.32	0.40	0.32	0.22	0.74	0.23	0.70	0.36	0.62
21 Apr 2020	0.74	0.80	0.24	0.76	0.24	0.35	0.35	0.31	0.19	0.31	0.24	0.89	0.32	0.72	0.22	0.62
22 Apr 2020	1.22	0.85	0.34	0.83	0.31	0.44	0.24	0.42	0.24	0.40	0.21	0.93	0.21	0.87	0.20	0.58
23 Apr 2020	1.01	0.91	0.25	0.89	0.19	0.45	0.22	0.27	0.15	0.54	0.30	1.02	0.36	0.94	0.18	0.56
24 Apr 2020	0.40	0.93	0.24	0.89	0.33	0.50	0.27	0.30	0.20	0.52	0.21	1.10	0.24	0.96	0.23	0.87
27 Apr 2020	2.07	0.89	0.60	0.84	0.35	0.49	0.39	0.43	0.32	0.40	0.44	0.75	0.45	0.72	0.38	0.67

Lions Bay Drinking Water Quality 2020 Annual Report

	HARVEY CREEK SYSTEM										MAGNESIA CREEK SYSTEM					
	HARVEY TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		MAGNESIA TANK		PRV-5		BRUNSWICK.	
	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²
28 Apr 2020	1.20	0.87	0.67	0.81	0.53	0.39	0.26	0.33	0.29	0.44	0.46	0.72	0.44	0.62	0.25	0.53
29 Apr 2020	1.08	0.97	0.19	0.91	0.22	0.49	0.23	0.31	0.22	0.48	0.35	0.89	0.44	0.83	0.28	0.44
30 Apr 2020	1.24	0.85	0.39	0.85	0.36	0.51	0.22	0.29	0.33	0.48	0.29	0.90	0.18	0.84	0.30	0.50
01 May 2020	1.73	0.84	0.32	0.78	0.19	0.45	0.28	0.34	0.26	0.53	0.40	0.91	0.39	0.85	0.28	0.57
04 May 2020	2.15	0.96	0.52	0.91	0.33	0.40	0.26	0.28	0.25	0.32	0.82	0.86	0.80	0.69	0.19	0.60
05 May 2020	1.59	1.05	0.34	1.06	0.33	0.56	0.17	0.27	0.31	0.47	0.69	0.82	0.40	1.00	0.48	0.35
06 May 2020	1.02	0.99	0.36	0.98	0.29	0.61	0.29	0.20	0.26	0.59	0.50	0.98	0.56	0.94	0.48	0.42
07 May 2020	2.58	0.90	0.56	0.86	0.37	0.53	0.34	0.24	0.28	0.55	0.74	1.02	0.49	0.90	0.46	0.56
08 May 2020	1.05	0.88	0.28	0.84	0.19	0.48	0.21	0.42	0.19	0.55	0.43	1.01	0.28	0.91	0.40	0.65
11 May 2020	1.48	0.82	0.25	0.74	0.21	0.35	0.14	0.31	0.15	0.34	0.35	0.68	0.34	0.66	0.77	0.57
12 May 2020	0.65	0.88	0.30	0.86	0.25	0.41	0.20	0.26	0.25	0.36	0.43	0.72	0.55	0.64	0.62	0.48
13 May 2020	1.21	0.82	0.31	0.80	0.33	0.42	0.19	0.22	0.38	0.39	0.52	0.76	0.45	0.65	0.31	0.37
14 May 2020	1.57	0.91	0.29	0.86	0.22	0.40	0.18	0.28	0.20	0.36	0.60	0.83	0.53	0.72	0.31	0.31
15 May 2020	0.44	0.88	0.29	0.84	0.25	0.56	0.18	0.27	0.29	0.56	0.37	0.93	0.44	0.74	0.36	0.47
19 May 2020	2.94	0.94	0.38	0.88	0.23	0.53	0.40	0.38	0.15	0.36	0.48	0.80	0.46	0.72	0.38	0.45
20 May 2020	0.49	0.94	0.39	0.91	0.31	0.55	0.23	0.34	0.24	0.48	0.43	0.92	0.27	0.91	0.36	0.55
21 May 2020	0.99	0.91	0.51	0.93	0.32	0.52	0.29	0.32	0.26	0.48	0.45	1.14	0.28	1.05	0.84	0.64
22 May 2020	0.53	0.89	0.21	0.89	0.21	0.51	0.16	0.46	0.21	0.47	0.35	1.08	0.26	1.00	0.31	0.68
25 May 2020	0.90	0.86	0.28	0.84	0.32	0.55	0.19	0.40	0.23	0.41	0.31	0.85	0.31	0.84	0.25	0.69
26 May 2020	0.75	0.84	0.32	0.78	0.21	0.49	0.15	0.38	0.34	0.44	0.37	0.72	0.33	0.65	0.23	0.66
27 May 2020	1.33	0.87	0.31	0.84	0.32	0.44	0.49	0.39	0.26	0.44	0.35	0.79	0.34	0.70	0.56	0.49
28 May 2020	0.17	0.93	0.25	0.88	0.31	0.54	1.23	0.32	0.18	0.43	0.31	0.86	0.29	0.76	0.26	0.39
29 May 2020	0.97	0.94	0.36	0.89	0.29	0.50	0.20	0.33	0.21	0.49	0.30	0.93	0.25	0.83	0.30	0.49
01 Jun 2020	0.55	0.84	0.55	0.87	0.33	0.40	0.23	0.45	0.19	0.37	0.31	0.93	0.45	0.86	0.46	0.51
02 Jun 2020	0.52	0.92	0.23	0.88	0.25	0.47	0.16	0.36	0.21	0.44	0.37	1.01	0.21	0.95	0.37	0.58
03 Jun 2020	1.85	0.98	0.23	0.85	0.31	0.40	0.22	0.39	0.25	0.45	0.49	1.02	0.24	0.95	0.23	0.59
04 Jun 2020	0.70	0.88	0.27	0.82	0.30	0.45	0.20	0.39	0.23	0.47	0.32	0.98	0.28	0.95	0.47	0.63

Lions Bay Drinking Water Quality 2020 Annual Report

	HARVEY CREEK SYSTEM										MAGNESIA CREEK SYSTEM					
	HARVEY TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		MAGNESIA TANK		PRV-5		BRUNSWICK.	
	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²
05 Jun 2020	0.57	0.81	0.34	0.79	0.25	0.41	0.18	0.45	0.20	0.46	0.30	0.90	0.21	0.86	0.23	0.70
08 Jun 2020	2.16	0.86	0.32	0.84	0.31	0.45	0.28	0.35	0.17	0.37	0.19	0.84	0.16	0.77	0.49	0.58
09 Jun 2020	2.14	0.90	0.29	0.85	0.18	0.50	2.17	0.39	0.22	0.44	0.65	0.81	0.30	0.76	0.38	0.66
10 Jun 2020	1.33	0.78	0.38	0.75	0.33	0.50	0.20	0.42	0.17	0.45	0.26	0.84	0.25	0.86	0.39	0.66
11 Jun 2020	1.77	0.79	0.66	0.74	0.30	0.44	0.28	0.40	0.31	0.33	0.29	0.79	0.29	0.74	0.29	0.37
12 Jun 2020	2.56	0.87	0.66	0.85	0.41	0.50	0.34	0.27	0.19	0.37	0.46	0.81	0.32	0.70	0.31	0.53
15 Jun 2020	0.88	0.98	0.42	0.96	0.20	0.59	0.19	0.27	0.33	0.36	0.25	0.85	0.26	0.76	0.25	0.46
16 Jun 2020	1.60	0.89	0.33	0.88	0.38	0.56	0.35	0.37	0.41	0.51	0.36	0.94	0.45	0.91	0.23	0.45
17 Jun 2020	1.56	0.85	0.29	0.84	0.18	0.51	0.14	0.42	0.15	0.41	0.22	1.01	0.28	0.89	0.27	0.51
18 Jun 2020	0.61	0.88	0.23	0.83	0.16	0.48	0.18	0.30	0.19	0.41	0.53	0.97	0.20	0.91	0.18	0.66
19 Jun 2020	0.27	0.83	0.35	0.86	0.29	0.59	0.20	0.30	0.16	0.43	0.30	0.90	0.21	0.84	0.30	0.71
22 Jun 2020	0.96	0.87	0.38	0.83	0.20	0.45	0.16	0.32	0.25	0.31	0.29	0.78	0.24	0.72	0.27	0.51
23 Jun 2020	1.10	0.92	0.23	0.91	0.24	0.54	0.57	0.32	0.18	0.43	0.31	0.82	0.24	0.74	0.24	0.42
24 Jun 2020	1.47	0.96	0.37	0.91	0.25	0.50	0.29	0.32	0.26	0.40	0.35	0.88	0.25	0.76	0.36	0.39
25 Jun 2020	0.76	0.88	0.37	0.87	0.31	0.56	0.31	0.38	0.22	0.45	0.29	1.05	0.34	0.83	0.25	0.46
26 Jun 2020	0.75	0.85	0.21	0.83	0.46	0.50	0.18	0.41	0.16	0.50	0.28	0.95	0.22	0.83	0.20	0.49
29 Jun 2020	1.03	0.93	0.26	0.93	0.38	0.60	0.20	0.40	0.28	0.41	0.20	0.99	0.34	0.91	0.22	0.69
30 Jun 2020	0.86	0.95	0.55	0.89	0.20	0.60	0.17	0.38	0.21	0.51	0.21	1.02	0.29	0.99	0.26	0.62
02 Jul 2020	0.78	0.83	0.41	0.79	0.26	0.48	0.27	0.32	0.18	0.47	0.36	0.94	0.29	0.88	0.45	0.76
03 Jul 2020	2.21	0.79	0.55	0.76	0.21	0.51	0.14	0.37	0.16	0.42	0.30	0.89	0.34	0.83	0.20	0.72
06 Jul 2020	1.11	0.92	0.24	0.92	0.23	0.56	0.22	0.41	0.25	0.27	0.26	0.90	0.28	0.79	0.21	0.45
07 Jul 2020	1.14	0.86	0.25	0.84	0.18	0.57	0.15	0.44	0.16	0.42	0.23	0.89	0.20	0.83	0.22	0.50
08 Jul 2020	0.31	0.83	0.17	0.81	0.17	0.47	0.13	0.37	0.14	0.38	0.20	0.90	0.31	0.83	0.19	0.59
09 Jul 2020	0.60	0.81	0.27	0.79	0.21	0.49	0.16	0.55	0.15	0.34	0.17	0.86	0.21	0.91	0.19	0.60
10 Jul 2020	0.78	0.80	0.20	0.78	0.22	0.50	0.16	0.38	0.14	0.41	0.23	0.88	0.15	0.76	0.21	0.60
13 Jul 2020	0.35	0.91	0.25	0.86	0.22	0.57	0.19	0.33	0.25	0.22	0.18	0.76	0.24	0.70	0.20	0.48
14 Jul 2020	1.15	0.88	0.24	0.90	0.21	0.57	0.24	0.34	0.21	0.46	0.32	0.87	0.23	0.81	0.18	0.54

Lions Bay Drinking Water Quality 2020 Annual Report

	HARVEY CREEK SYSTEM										MAGNESIA CREEK SYSTEM					
	HARVEY TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		MAGNESIA TANK		PRV-5		BRUNSWICK.	
	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²
15 Jul 2020	2.07	0.93	0.28	0.91	0.21	0.59	0.20	0.32	0.21	0.49	0.29	0.98	0.19	0.89	0.18	0.58
16 Jul 2020	1.39	0.92	0.23	0.91	0.21	0.61	0.15	0.44	0.13	0.51	0.20	1.10	0.32	0.93	0.41	0.75
17 Jul 2020	1.69	0.86	0.35	0.82	0.24	0.61	0.15	0.47	0.35	0.53	0.24	0.98	0.29	0.94	0.26	0.90
20 Jul 2020	1.71	0.87	0.31	0.85	0.20	0.56	0.19	0.30	0.18	0.43	0.25	0.79	0.29	0.70	0.31	0.59
21 Jul 2020	0.68	0.87	0.22	0.85	0.18	0.56	0.15	0.35	0.16	0.48	1.37	0.79	0.43	0.61	0.53	0.51
22 Jul 2020	2.19	0.88	0.23	0.87	0.36	0.59	0.13	0.37	0.13	0.55	0.31	0.88	0.39	0.81	0.30	0.72
23 Jul 2020	0.77	0.89	0.30	0.85	0.24	0.61	0.24	0.50	0.26	0.51	0.47	0.80	0.27	0.74	0.33	0.62
24 Jul 2020	0.42	0.88	0.19	0.84	0.20	0.64	0.13	0.41	0.15	0.51	0.26	0.80	0.19	0.71	0.22	0.54
27 Jul 2020	1.12	0.89	0.19	0.88	0.16	0.73	0.12	0.45	0.14	0.45	0.21	0.84	0.17	0.83	0.21	0.77
28 Jul 2020	0.55	0.83	0.21	0.84	0.22	0.60	0.18	0.53	0.16	0.53	0.19	0.98	0.43	0.94	0.21	0.83
29 Jul 2020	0.36	0.82	0.16	0.82	0.16	0.52	0.26	0.50	0.17	0.50	0.28	0.96	0.19	0.90	0.16	0.88
30 Jul 2020	0.29	0.84	0.18	0.83	0.21	0.62	0.12	0.55	0.14	0.48	0.27	0.98	0.15	0.95	0.21	0.82
31 Jul 2020	0.85	0.20	0.82	0.17	0.66	0.17	0.56	0.15	0.52	0.19	0.86	0.29	0.80	0.23	0.67	1.37
04 Aug 2020	1.83	0.82	0.42	0.80	0.28	0.61	0.26	0.45	0.13	0.46	0.28	0.81	0.68	0.75	0.30	0.65
05 Aug 2020	1.46	0.88	0.33	0.82	0.18	0.65	0.15	0.42	0.17	0.50	0.22	0.78	1.07	0.75	0.22	0.55
06 Aug 2020	1.10	0.85	0.39	0.85	0.17	0.60	0.13	0.51	0.18	0.52	0.18	0.80	0.30	0.75	0.20	0.59
07 Aug 2020	0.42	0.63	0.24	0.64	0.25	0.37	0.27	0.60	0.12	0.47	0.18	0.78	0.20	0.71	0.29	0.44
10 Aug 2020	0.92	0.86	0.28	0.83	0.30	0.66	0.20	0.28	0.20	0.28	0.27	0.82	0.50	0.78	0.49	0.23
11 Aug 2020	1.47	0.81	0.25	0.86	0.22	0.54	0.30	0.36	0.17	0.36	0.24	0.90	0.29	0.86	0.53	0.42
12 Aug 2020	0.56	0.87	0.21	0.79	0.15	0.58	0.13	0.31	0.15	0.37	0.17	0.95	0.21	0.90	0.34	0.50
13 Aug 2020	1.04	0.89	0.17	0.85	0.25	0.69	0.11	0.68	0.16	0.42	0.55	0.89	0.44	0.77	0.50	0.48
14 Aug 2020	0.44	0.85	0.14	0.87	0.35	0.60	0.12	0.45	0.14	0.46	0.33	0.94	0.29	0.83	0.55	0.43
17 Aug 2020	0.99	0.86	0.77	0.84	0.18	0.61	0.16	0.58	0.16	0.45	0.17	0.77	0.19	0.71	0.71	0.43
18 Aug 2020	1.48	0.84	0.14	0.81	0.15	0.56	0.17	0.42	0.19	0.44	0.26	0.77	0.36	0.70	0.53	0.45
19 Aug 2020	1.57	0.85	0.27	0.81	0.18	0.62	0.13	0.35	0.15	0.47	0.18	0.80	0.24	0.76	0.37	0.44
20 Aug 2020	0.40	0.83	0.54	0.81	0.20	0.63	0.12	0.47	0.19	0.62	0.47	1.05	0.44	0.97	0.45	0.42
21 Aug 2020	1.54	0.60	0.75	0.60	0.24	0.48	0.14	0.38	0.19	0.47	0.25	1.08	0.20	0.98	0.39	0.36

Lions Bay Drinking Water Quality 2020 Annual Report

	HARVEY CREEK SYSTEM										MAGNESIA CREEK SYSTEM					
	HARVEY TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		MAGNESIA TANK		PRV-5		BRUNSWICK.	
	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²
24 Aug 2020	1.45	0.75	0.56	0.72	0.41	0.39	1.15	0.55	0.28	0.21	0.42	0.95	0.84	0.83	0.80	0.23
25 Aug 2020	1.20	0.75	0.60	0.76	0.63	0.48	0.39	0.56	0.20	0.20	0.50	0.89	0.29	0.86	1.27	0.23
26 Aug 2020	0.82	0.93	0.27	0.85	0.24	0.58	0.28	0.72	0.18	0.23	0.30	0.93	0.33	0.90	0.40	0.33
27 Aug 2020	0.65	0.85	0.32	0.83	0.22	0.81	0.20	0.70	0.25	0.26	0.20	0.83	0.22	0.82	0.52	0.34
28 Aug 2020	0.24	0.82	0.34	0.82	0.20	0.51	0.23	0.73	0.17	0.31	0.24	0.86	0.24	0.78	0.31	0.36
31 Aug 2020	2.94	0.88	0.32	0.83	0.26	0.47	0.39	0.74	0.16	0.28	0.27	0.80	0.24	0.77	0.32	0.42
01 Sep 2020	0.34	0.78	0.33	0.77	0.32	0.56	0.24	0.68	0.13	0.35	0.23	0.78	0.19	0.76	0.54	0.42
02 Sep 2020	1.07	0.86	0.24	0.84	0.18	0.52	0.13	0.77	0.12	0.39	0.17	0.84	0.16	0.78	0.31	0.52
03 Sep 2020	0.52	0.87	0.30	0.84	0.29	0.65	0.16	0.57	0.22	0.42	1.35	0.95	0.58	0.87	0.28	0.47
04 Sep 2020	0.44	0.88	0.33	0.86	0.41	0.69	0.27	0.75	0.23	0.46	0.75	0.81	0.62	0.76	0.63	0.56
08 Sep 2020	0.23	0.83	0.14	0.82	0.18	0.53	0.12	0.71	0.12	0.50	0.18	0.81	0.17	0.76	0.24	0.64
09 Sep 2020	0.17	0.83	0.16	0.82	0.18	0.52	0.12	0.73	0.11	0.47	0.32	0.91	0.18	0.84	0.29	0.53
10 Sep 2020	0.44	0.84	0.19	0.83	0.31	0.56	0.17	0.74	0.19	0.53	0.19	0.85	0.20	0.84	0.31	0.43
11 Sep 2020	0.60	0.84	0.24	0.84	0.18	0.59	0.15	0.73	0.16	0.48	0.19	0.86	0.19	0.81	0.28	0.54
14 Sep 2020	0.24	0.86	0.15	0.84	0.16	0.60	0.12	0.77	0.15	0.48	0.48	0.89	0.26	0.87	0.49	0.45
15 Sep 2020	0.32	0.87	0.21	0.87	0.21	0.59	0.17	0.75	0.21	0.48	0.19	0.79	0.27	0.76	0.34	0.62
16 Sep 2020	0.36	0.81	0.17	0.82	0.22	0.57	0.16	0.75	0.21	0.49	0.14	0.81	0.16	0.78	0.25	0.54
17 Sep 2020	0.75	0.86	0.24	0.84	0.28	0.57	0.18	0.70	0.17	0.44	0.25	0.90	0.20	0.83	0.43	0.48
18 Sep 2020	0.22	0.83	0.32	0.83	0.23	0.62	0.31	0.69	0.19	0.51	0.29	0.90	0.22	0.86	0.22	0.72
21 Sep 2020	1.60	0.89	0.21	0.88	0.19	0.56	0.26	0.73	0.21	0.33	0.27	0.88	0.32	0.88	0.25	0.62
22 Sep 2020	0.73	0.92	0.30	0.88	0.22	0.59	0.20	0.64	0.20	0.40	0.29	1.03	0.22	0.91	0.35	0.69
23 Sep 2020	1.73	0.87	0.18	0.90	0.23	0.59	0.33	0.79	0.21	0.44	0.31	0.91	0.21	0.87	0.21	0.71
24 Sep 2020	1.05	0.74	0.53	0.71	0.26	0.30	0.18	0.63	0.18	0.44	0.45	0.83	0.33	0.67	0.20	0.68
25 Sep 2020	4.00	0.80	0.69	0.79	0.38	0.36	0.42	0.34	0.36	0.31	1.16	0.88	0.42	0.80	0.40	0.38
28 Sep 2020	2.96	0.89	0.50	0.79	0.44	0.52	0.40	0.59	0.50	0.20	0.61	0.88	0.41	0.81	0.60	0.42
29 Sep 2020	1.52	0.83	0.36	0.79	0.28	0.42	0.26	0.49	0.24	0.20	0.43	0.79	0.32	0.73	0.25	0.32
30 Sep 2020	1.45	0.87	0.43	0.82	0.35	0.44	0.29	0.52	0.38	0.27	0.34	0.87	0.44	0.75	0.37	0.26

Lions Bay Drinking Water Quality 2020 Annual Report

	HARVEY CREEK SYSTEM										MAGNESIA CREEK SYSTEM					
	HARVEY TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		MAGNESIA TANK		PRV-5		BRUNSWICK.	
	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²
01 Oct 2020	6.39	0.93	0.26	0.86	0.22	0.58	0.22	0.54	0.36	0.31	0.27	1.03	0.32	0.92	0.36	0.35
02 Oct 2020	0.71	0.92	0.25	0.80	0.23	0.56	0.25	0.58	0.18	0.38	0.30	1.00	0.26	0.97	0.34	0.26
05 Oct 2020	2.10	0.88	0.37	0.86	0.31	0.60	0.28	0.65	0.26	0.45	0.37	0.88	0.34	0.80	0.26	0.60
06 Oct 2020	0.24	0.89	0.29	0.85	0.21	0.54	0.29	0.74	0.18	0.45	0.26	0.93	0.29	0.86	0.26	0.61
07 Oct 2020	2.01	0.89	0.29	0.88	0.19	0.54	0.16	0.69	0.17	0.48	0.20	0.98	0.16	0.92	0.18	0.66
08 Oct 2020	0.58	0.90	0.18	0.84	0.19	0.57	0.17	0.71	0.15	0.45	0.17	0.94	0.17	0.91	0.22	0.70
09 Oct 2020	1.41	0.84	0.39	0.81	0.26	0.61	0.24	0.66	0.26	0.47	0.53	0.96	0.24	0.89	0.35	0.60
13 Oct 2020	2.91	0.79	0.37	0.76	0.40	0.44	0.33	0.44	0.39	0.24	0.53	0.84	0.43	0.74	0.49	0.25
14 Oct 2020	4.71	0.86	0.40	0.84	0.29	0.29	0.33	0.45	0.23	0.21	0.39	0.81	0.40	0.70	1.16	0.34
15 Oct 2020	2.25	1.02	0.42	1.00	0.27	0.34	0.26	0.47	0.23	0.57	0.24	0.85	0.24	0.77	0.43	0.23
16 Oct 2020	3.68	1.06	0.38	1.01	0.52	0.58	0.28	0.53	0.29	0.41	0.52	0.77	0.24	0.70	0.41	0.20
19 Oct 2020	3.14	0.90	1.42	0.85	0.25	0.61	0.35	0.59	0.17	0.53	0.58	0.82	1.02	0.79	0.89	0.43
20 Oct 2020	4.12	0.89	0.32	0.86	0.24	0.47	0.50	0.62	0.30	0.39	0.74	1.09	0.54	1.02	0.50	0.41
21 Oct 2020	3.36	0.93	0.39	0.88	0.42	0.49	0.27	0.63	0.49	0.42	0.37	0.81	0.31	0.79	0.49	0.31
22 Oct 2020	0.48	0.87	0.50	0.87	0.45	0.52	0.19	0.59	0.20	0.44	0.25	0.78	0.24	0.74	0.30	0.44
23 Oct 2020	0.53	0.84	0.19	0.81	0.22	0.49	0.15	0.61	0.16	0.38	0.24	1.08	0.19	1.03	0.25	0.39
26 Oct 2020	0.47	0.95	0.19	0.86	0.18	0.50	0.14	0.58	0.16	0.34	0.26	0.77	0.26	0.78	1.17	0.69
27 Oct 2020	1.20	0.96	0.33	0.89	0.23	0.63	0.20	0.73	0.41	0.50	0.79	0.80	0.38	0.61	0.42	0.46
28 Oct 2020	0.50	0.89	0.24	0.79	0.27	0.54	0.12	0.74	0.16	0.53	0.36	0.88	0.26	0.84	0.34	0.37
29 Oct 2020	0.77	0.71	0.48	0.66	0.43	0.41	0.18	0.61	0.17	0.40	0.56	0.91	0.36	0.88	0.37	0.28
30 Oct 2020	1.43	0.74	0.23	0.71	0.47	0.40	0.25	0.43	0.85	0.41	0.31	0.84	0.24	0.81	0.41	0.32
02 Nov 2020	0.14	0.85	0.20	0.90	0.24	0.58	0.21	0.64	0.19	0.40	0.21	0.85	0.22	0.84	0.19	0.50
03 Nov 2020	0.44	0.80	0.46	0.80	0.64	0.56	0.15	0.62	0.18	0.51	0.24	0.99	1.00	0.98	0.39	0.79
04 Nov 2020	0.59	0.69	0.52	0.67	0.29	0.28	0.23	0.59	0.23	0.42	0.57	0.73	0.81	0.69	0.53	0.63
05 Nov 2020	0.74	0.96	0.37	0.93	0.27	0.39	0.18	0.29	0.17	0.20	0.58	0.89	0.27	0.72	0.30	0.53
06 Nov 2020	0.39	1.02	0.80	0.97	0.25	0.57	0.24	0.46	0.20	0.49	0.26	0.96	0.26	0.87	0.33	0.29
09 Nov 2020	0.28	0.89	0.17	0.83	0.18	0.46	0.16	0.23	0.58	0.66	0.16	0.82	0.20	0.82	0.19	0.58

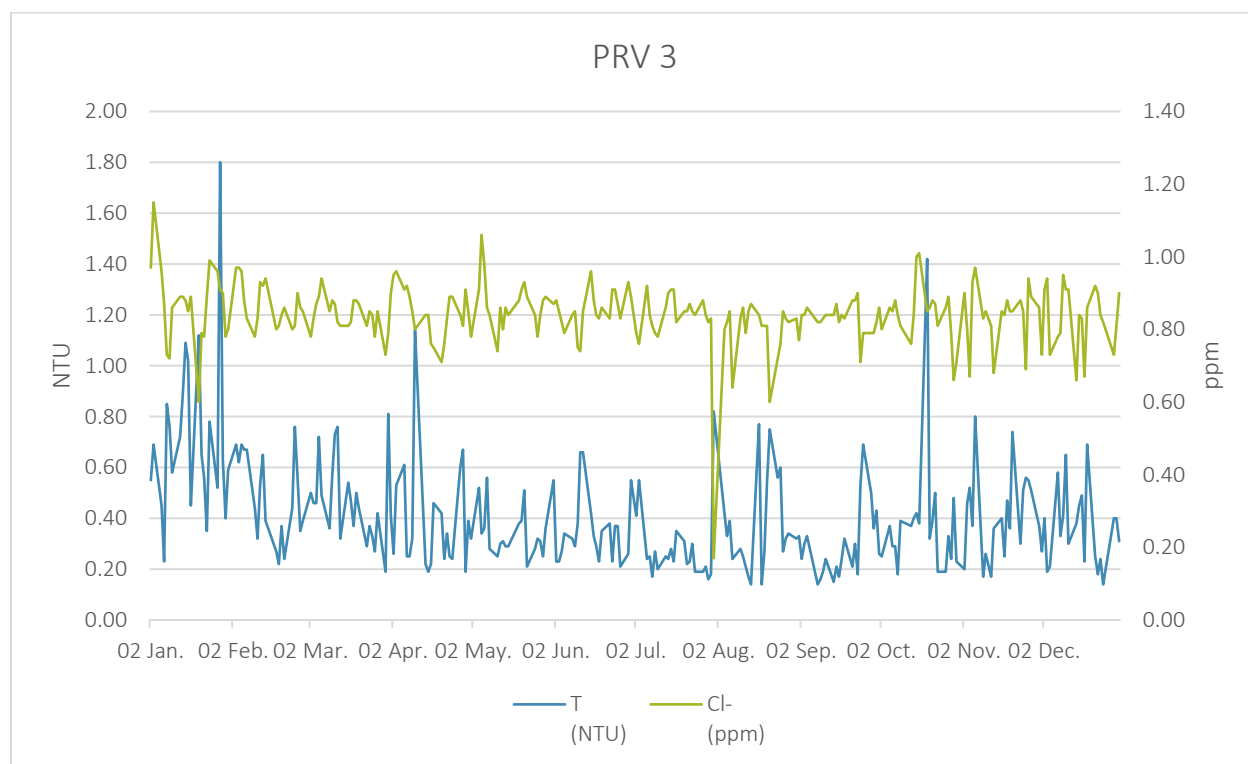
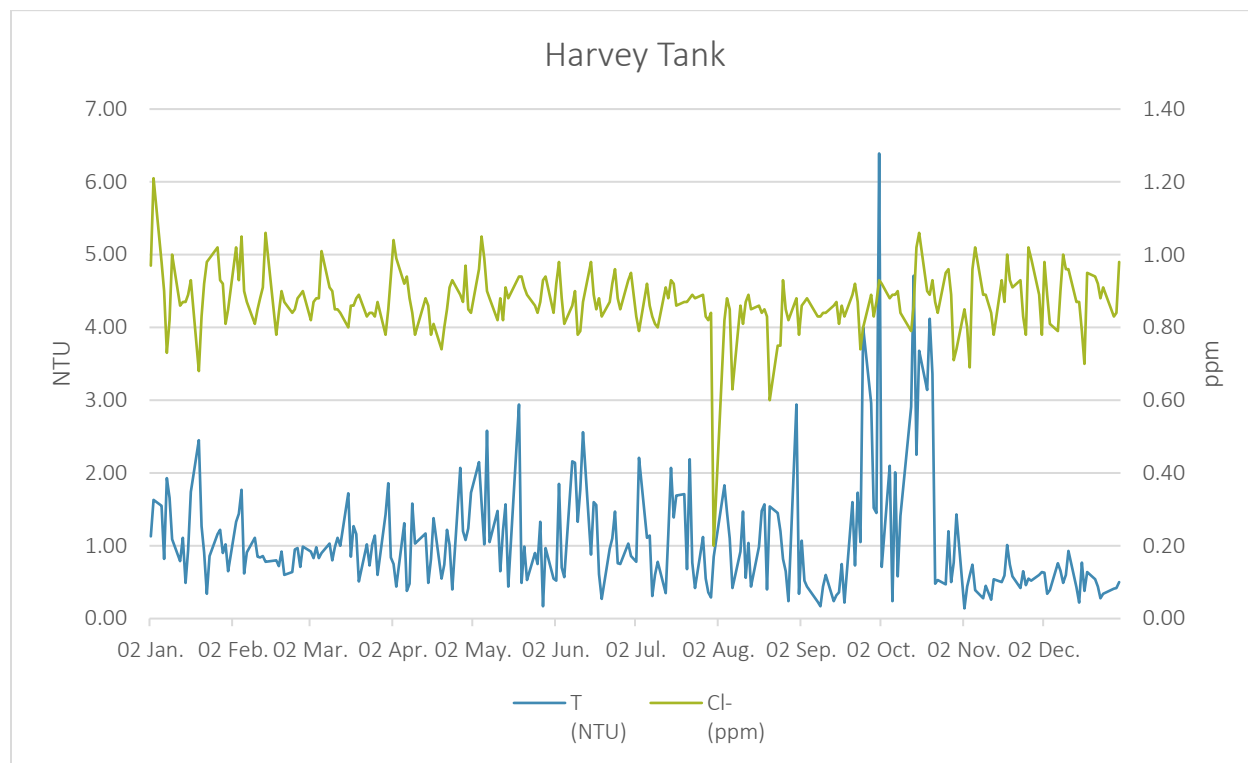
Lions Bay Drinking Water Quality 2020 Annual Report

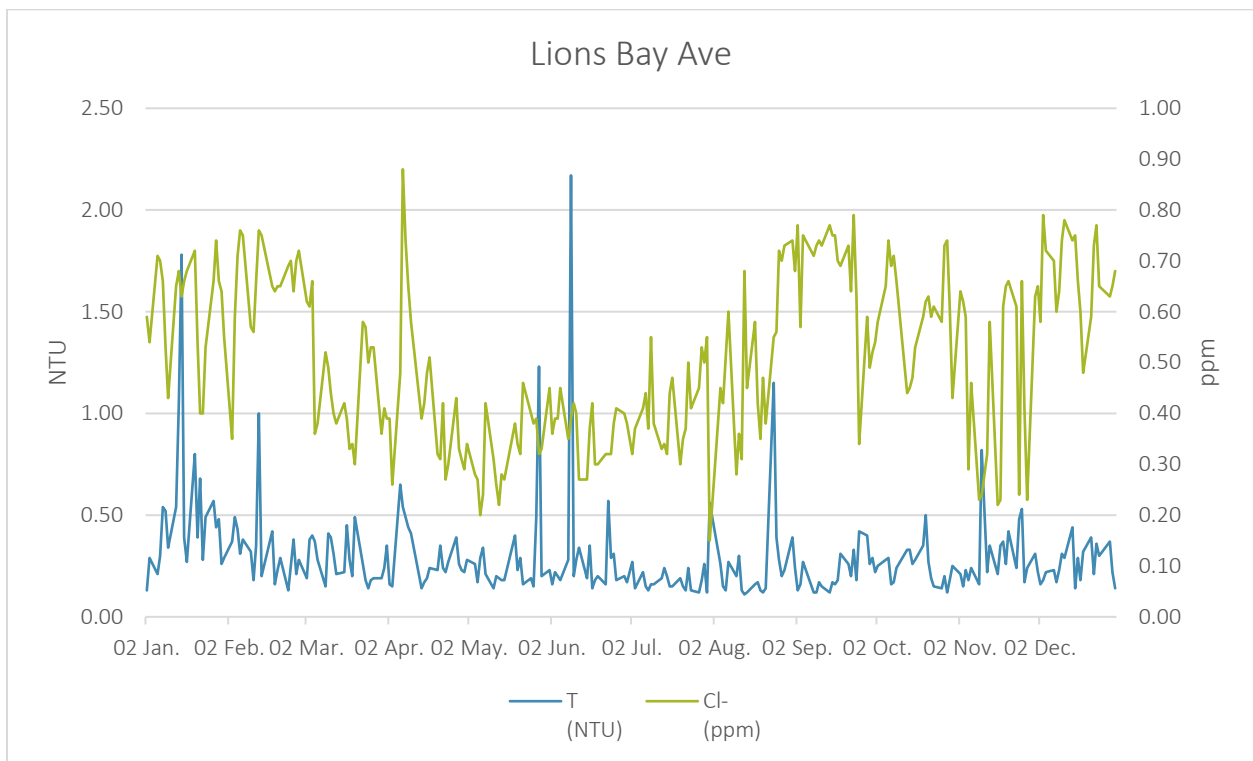
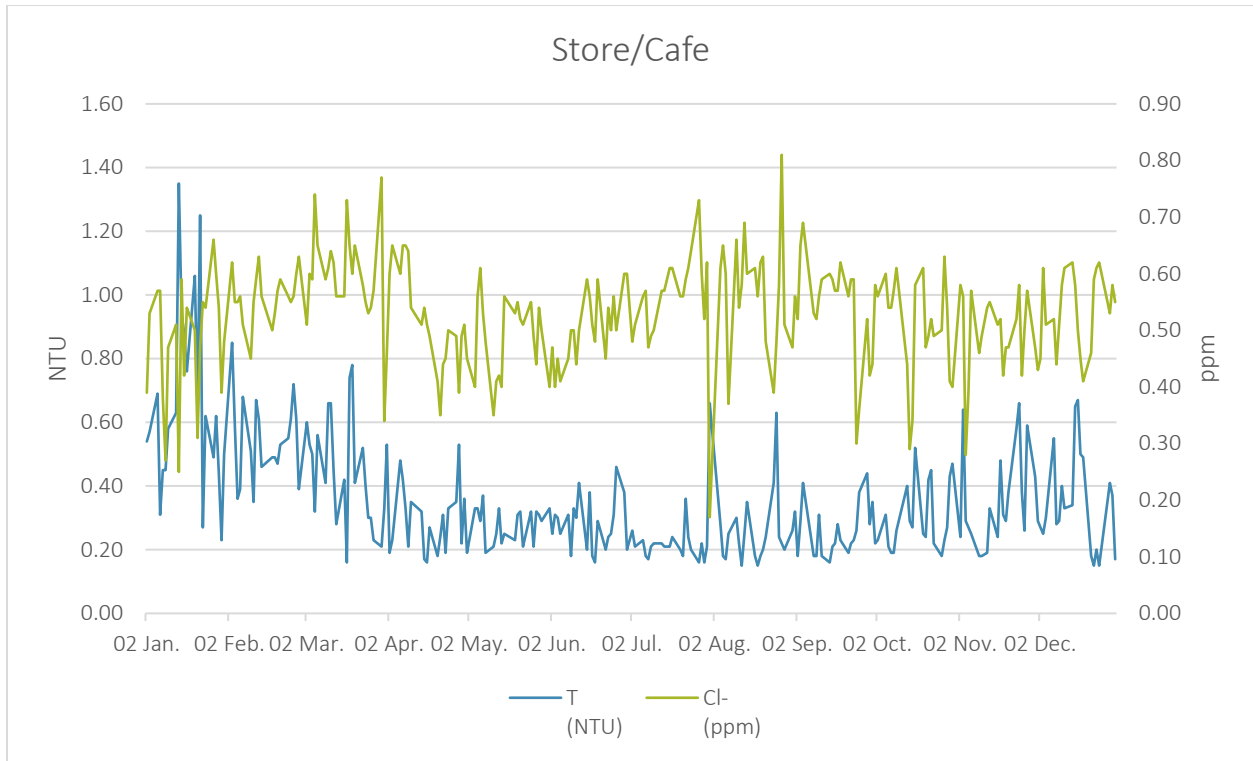
	HARVEY CREEK SYSTEM										MAGNESIA CREEK SYSTEM					
	HARVEY TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		MAGNESIA TANK		PRV-5		BRUNSWICK.	
	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²
10 Nov 2020	0.45	0.89	0.26	0.85	0.18	0.49	0.82	0.24	0.55	0.61	0.70	0.74	0.28	0.70	0.31	0.56
12 Nov 2020	0.26	0.84	0.17	0.81	0.19	0.54	0.22	0.32	0.14	0.48	0.19	0.94	0.14	1.01	0.19	0.38
13 Nov 2020	0.54	0.78	0.36	0.68	0.33	0.55	0.35	0.58	0.17	0.57	0.29	0.96	0.21	0.78	0.21	0.57
16 Nov 2020	0.50	0.93	0.40	0.85	0.24	0.51	0.21	0.22	0.40	0.21	0.31	0.81	0.41	0.77	0.27	0.59
17 Nov 2020	0.59	0.87	0.25	0.84	0.48	0.52	0.35	0.23	0.17	0.34	0.34	1.01	0.31	0.95	0.40	0.53
18 Nov 2020	1.01	1.00	0.47	0.88	0.31	0.42	0.37	0.61	0.28	0.30	1.24	0.81	0.66	0.81	0.50	0.52
19 Nov 2020	0.74	0.93	0.36	0.85	0.29	0.47	0.26	0.65	0.29	0.29	1.11	0.80	0.32	0.82	0.43	0.60
20 Nov 2020	0.58	0.91	0.74	0.85	0.38	0.47	0.42	0.66	0.24	0.35	0.53	1.12	0.33	1.04	0.41	0.30
23 Nov 2020	0.42	0.93	0.30	0.88	0.58	0.52	0.24	0.61	0.21	0.36	0.34	0.85	0.37	0.86	0.22	0.54
24 Nov 2020	0.65	0.83	0.51	0.85	0.66	0.58	0.48	0.24	0.31	0.69	0.48	0.85	1.14	0.82	0.62	0.70
25 Nov 2020	0.46	0.78	0.56	0.69	0.38	0.42	0.53	0.66	0.18	0.47	0.43	0.95	0.66	0.92	0.21	0.74
26 Nov 2020	0.55	1.02	0.55	0.94	0.26	0.50	0.17	0.41	0.25	0.31	0.59	0.84	0.60	0.78	0.42	0.80
27 Nov 2020	0.52	0.99	0.51	0.89	0.59	0.57	0.24	0.23	0.20	0.48	0.33	0.79	0.24	0.76	0.27	0.67
30 Nov 2020	0.60	0.89	0.37	0.86	0.43	0.47	0.31	0.63	0.23	0.22	0.56	0.77	0.36	0.71	0.34	0.70
01 Dec 2020	0.64	0.78	0.27	0.73	0.29	0.43	0.22	0.65	0.29	0.50	0.29	1.05	0.30	1.01	0.36	0.73
02 Dec 2020	0.63	0.98	0.40	0.91	0.27	0.45	0.16	0.58	0.16	0.36	0.40	1.05	0.25	0.98	0.26	0.89
03 Dec 2020	0.34	0.89	0.19	0.94	0.25	0.61	0.18	0.79	0.51	0.51	0.50	0.92	0.32	0.89	0.31	0.87
04 Dec 2020	0.39	0.81	0.21	0.73	0.30	0.51	0.22	0.72	0.18	0.55	0.32	0.83	0.58	0.77	0.36	0.74
07 Dec 2020	0.76	0.79	0.58	0.78	0.55	0.52	0.23	0.70	0.21	0.45	0.72	0.83	0.46	0.85	0.36	0.77
08 Dec 2020	0.66	0.90	0.33	0.79	0.28	0.44	0.17	0.60	0.23	0.50	0.62	0.79	0.44	0.69	0.36	0.74
09 Dec 2020	0.49	1.00	0.41	0.95	0.29	0.51	0.23	0.64	0.34	0.39	0.70	0.71	0.36	0.87	0.39	0.55
10 Dec 2020	0.60	0.96	0.65	0.91	0.40	0.58	0.31	0.74	0.29	0.48	0.61	0.65	0.30	0.91	0.49	0.82
11 Dec 2020	0.93	0.96	0.30	0.91	0.33	0.61	0.29	0.78	0.19	0.57	1.94	0.73	0.77	0.68	1.00	0.68
14 Dec 2020	0.43	0.87	0.38	0.66	0.34	0.62	0.44	0.74	0.48	0.49	0.37	0.85	0.36	0.84	0.32	0.79
15 Dec 2020	0.22	0.87	0.45	0.84	0.65	0.58	0.14	0.75	0.31	0.58	0.25	0.87	0.45	0.83	0.47	0.74
16 Dec 2020	0.77	0.79	0.49	0.83	0.67	0.50	0.29	0.66	0.20	0.61	0.38	1.17	0.30	1.08	0.32	0.76
17 Dec 2020	0.38	0.70	0.23	0.67	0.50	0.45	0.18	0.60	0.30	0.43	0.46	0.92	0.39	0.92	0.29	1.05

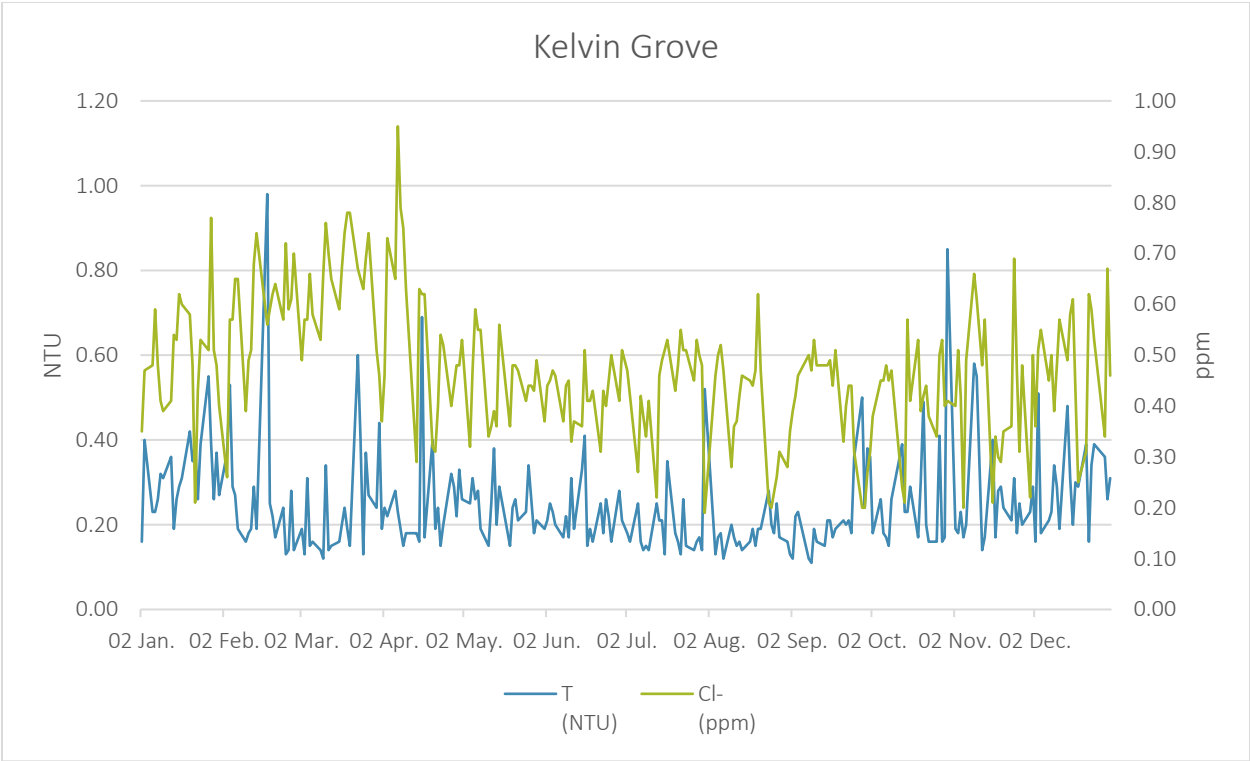
	HARVEY CREEK SYSTEM								MAGNESIA CREEK SYSTEM							
	HARVEY TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		MAGNESIA TANK		PRV-5		BRUNSWICK.	
	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²	NTU	CL ²
18 Dec 2020	0.64	0.95	0.69	0.86	0.49	0.41	0.32	0.48	0.29	0.25	0.46	0.80	0.54	0.71	1.43	0.68
21 Dec 2020	0.54	0.94	0.25	0.92	0.18	0.46	0.39	0.59	0.39	0.31	0.36	0.87	0.44	0.84	0.28	0.70
22 Dec 2020	0.44	0.92	0.18	0.90	0.15	0.59	0.21	0.73	0.16	0.62	0.30	0.78	0.31	0.69	0.23	0.61
23 Dec 2020	0.28	0.88	0.24	0.84	0.20	0.61	0.36	0.77	0.34	0.59	0.27	0.88	0.22	0.81	0.25	0.66
24 Dec 2020	0.34	0.91	0.14	0.82	0.15	0.62	0.30	0.65	0.39	0.53	0.24	0.99	0.20	0.90	0.37	0.76
28 Dec 2020	0.41	0.83	0.40	0.73	0.41	0.53	0.37	0.63	0.36	0.34	0.27	0.86	0.36	0.86	0.40	0.67
29 Dec 2020	0.42	0.84	0.40	0.81	0.37	0.58	0.22	0.65	0.26	0.67	0.33	1.03	0.30	0.81	0.24	0.73
30 Dec 2020	0.50	0.98	0.31	0.90	0.17	0.55	0.14	0.68	0.31	0.46	0.27	0.90	0.30	0.82	0.24	0.77

APPENDIX F – CHLORINE RESIDUAL AGAINST TURBIDITY GRAPHS

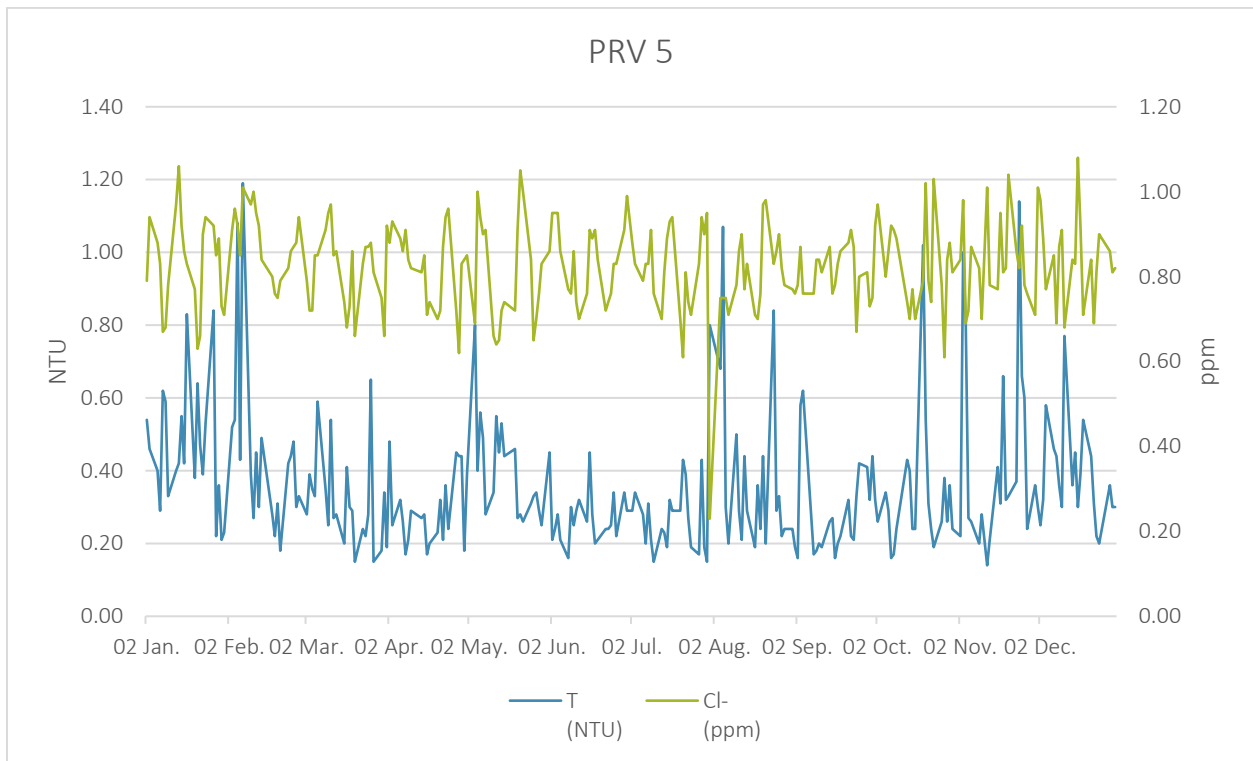
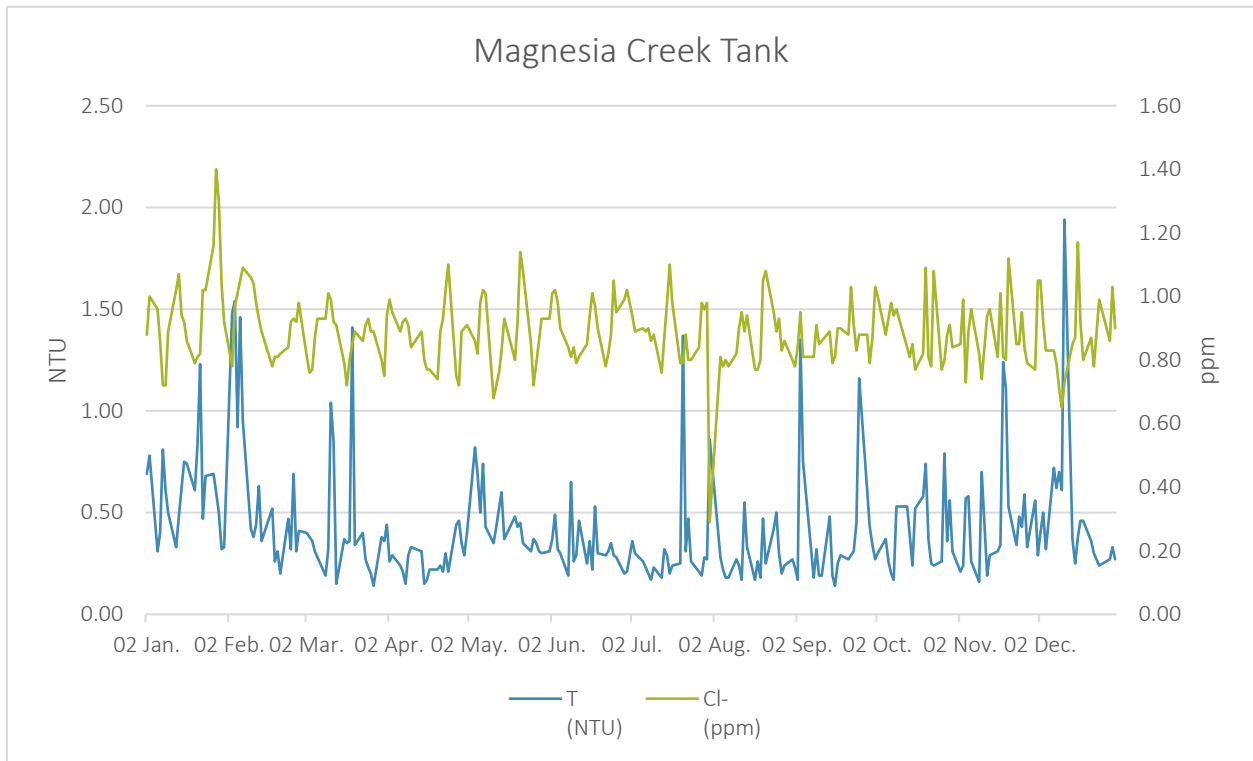
HARVEY CREEK WATER SUPPLY

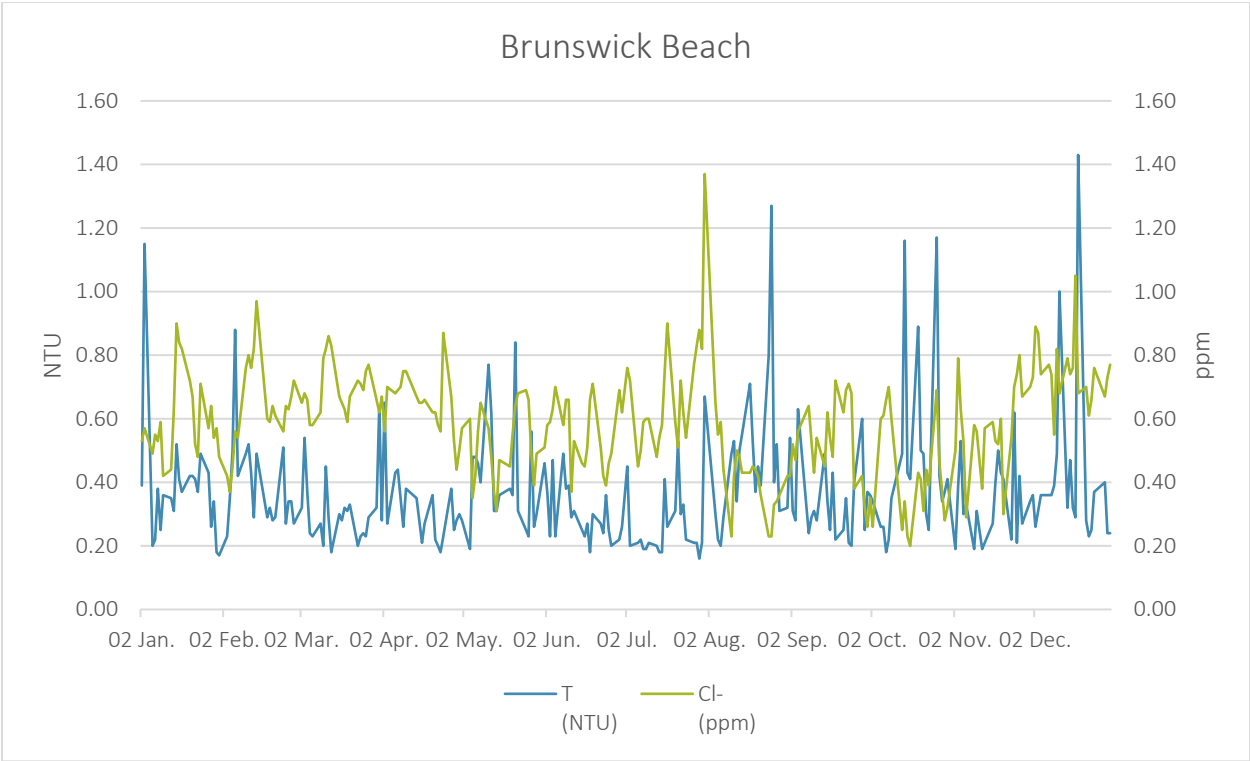






MAGNESIA CREEK WATER SUPPLY





APPENDIX G – BIENNIAL METALS AND CHEMISTRY RESULTS

MARCH 17, 2020 RESULTS

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 5 of 14
 Work Order : VA20A3442
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Water

Client sample ID

(Matrix: Water)

					Harvey Tank (First Draw)	Harvey Tank (After Flush)	Store / Cafe (First Draw)	Store / Cafe (After Flush)	Lions Bay Ave (First Draw)
Client sampling date / time					17-Mar-2020 10:05	17-Mar-2020 10:05	17-Mar-2020 06:50	17-Mar-2020 06:50	17-Mar-2020 12:30
Analyte	CAS Number	Method	LOR	Unit	VA20A3442-001	VA20A3442-002	VA20A3442-003	VA20A3442-004	VA20A3442-005
					Result	Result	Result	Result	Result
Physical Tests									
alkalinity, total (as CaCO ₃)	----	E290	1.0	mg/L	6.3	----	7.0	----	7.5
hardness (as CaCO ₃), from total Ca/Mg	----	EC100A	0.60	mg/L	6.84	6.92	7.55	7.31	7.68
pH	----	E108	0.10	pH units	7.00	----	7.03	----	7.19
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	<3.0	----	<3.0	----	<3.0
turbidity	----	E121	0.10	NTU	<0.10	----	0.10	----	<0.10
Organic / Inorganic Carbon									
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.42	----	1.33	----	1.34
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0302	0.0285	0.0177	0.0271	0.0176
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00011	0.00010	<0.00010	<0.00010	0.00011
barium, total	7440-39-3	E420	0.00010	mg/L	0.00155	0.00154	0.00173	0.00147	0.00167
beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000056
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000098	<0.0000050	<0.0000050	<0.0000050	<0.0000050
calcium, total	7440-70-2	E420	0.050	mg/L	2.23	2.27	2.52	2.44	2.60
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00036
copper, total	7440-50-8	E420	0.00050	mg/L	0.314	0.00519	0.165	0.0180	0.0214
iron, total	7439-89-6	E420	0.010	mg/L	0.013	<0.010	0.032	0.063	0.044
lead, total	7439-92-1	E420	0.000050	mg/L	0.00169	0.000060	0.000603	0.000175	0.000868
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
magnesium, total	7439-95-4	E420	0.0050	mg/L	0.308	0.304	0.308	0.292	0.289
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00053	0.00018	0.00092	0.00048	0.00359
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	----	<0.0000050	----	<0.0000050
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000337	0.000497	0.000366	0.000436	0.000559
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.0105
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, total	7440-09-7	E420	0.050	mg/L	0.090	0.081	0.086	0.086	0.104

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 6 of 14
 Work Order : VA20A3442
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Water

Client sample ID

(Matrix: Water)

					Harvey Tank (First Draw)	Harvey Tank (After Flush)	Store / Cafe (First Draw)	Store / Cafe (After Flush)	Lions Bay Ave (First Draw)
Client sampling date / time					17-Mar-2020 10:05	17-Mar-2020 10:05	17-Mar-2020 06:50	17-Mar-2020 06:50	17-Mar-2020 12:30
Analyte	CAS Number	Method	LOR	Unit	VA20A3442-001	VA20A3442-002	VA20A3442-003	VA20A3442-004	VA20A3442-005
					Result	Result	Result	Result	Result
Total Metals									
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00021	<0.00020	<0.00020	<0.00020	0.00022
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
silicon, total	7440-21-3	E420	0.10	mg/L	2.21	2.43	2.55	2.45	2.36
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, total	7440-23-5	E420	0.050	mg/L	1.94	2.04	2.06	2.01	1.99
strontium, total	7440-24-6	E420	0.00020	mg/L	0.00625	0.00611	0.00734	0.00674	0.00720
sulfur, total	7704-34-9	E420	0.50	mg/L	0.55	0.58	0.58	0.58	0.52
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00039	<0.00030	<0.00030	<0.00030	<0.00030
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000026	0.000037	0.000022	0.000038	0.000020
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0469	<0.0030	0.0950	<0.0030	0.0190
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Aggregate Organics									
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	----	<2.0	----	<2.0
Trihalomethanes									
bromodichloromethane	75-27-4	E611B	1.0	µg/L	<1.0	----	<1.0	----	<1.0
bromoform	75-25-2	E611B	1.0	µg/L	<1.0	----	<1.0	----	<1.0
chloroform	67-66-3	E611B	1.0	µg/L	18.9	----	26.3	----	39.1
dibromochloromethane	124-48-1	E611B	1.0	µg/L	<1.0	----	<1.0	----	<1.0
trihalomethanes [THMs], total	----	E611B	2.0	µg/L	18.9	----	26.3	----	39.1
Trihalomethanes Surrogates									
bromofluorobenzene, 4-	460-00-4	E611B	1.0	%	97.7	----	90.8	----	102
difluorobenzene, 1,4-	540-36-3	E611B	1.0	%	90.6	----	92.3	----	92.1

Please refer to the General Comments section for an explanation of any qualifiers detected.

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 7 of 14
 Work Order : VA20A3442
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Water
 (Matrix: Water)

Client sample ID

					Lions Bay Ave (After Flush)	Kelvin Grove (First Draw)	Kelvin Grove (After Flush)	Community Centre (First Draw)	Community Centre (After Flush)
Client sampling date / time					17-Mar-2020 12:30	17-Mar-2020 07:50	17-Mar-2020 07:50	17-Mar-2020 06:20	17-Mar-2020 06:20
Analyte	CAS Number	Method	LOR	Unit	VA20A3442-006	VA20A3442-007	VA20A3442-008	VA20A3442-009	VA20A3442-010
					Result	Result	Result	Result	Result
Physical Tests									
alkalinity, total (as CaCO ₃)	----	E290	1.0	mg/L	----	7.3	----	6.7	----
hardness (as CaCO ₃), from total Ca/Mg	----	EC100A	0.60	mg/L	7.81	10.5	7.74	7.88	7.32
pH	----	E108	0.10	pH units	----	7.16	----	7.02	----
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	----	<3.0	----	<3.0	----
turbidity	----	E121	0.10	NTU	----	0.11	----	<0.10	----
Organic / Inorganic Carbon									
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	----	1.53	----	1.24	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0317	0.0304	0.0307	0.0259	0.0268
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	0.00013	0.00011	<0.00010	<0.00010
barium, total	7440-39-3	E420	0.00010	mg/L	0.00166	0.00188	0.00182	0.00189	0.00153
beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	0.00533	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	0.034	<0.010	<0.010	<0.010
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	0.0000103	<0.0000050
calcium, total	7440-70-2	E420	0.050	mg/L	2.64	2.79	2.64	2.53	2.46
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	0.000013	<0.000010	<0.000010	<0.000010
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	0.00022	<0.00010
copper, total	7440-50-8	E420	0.00050	mg/L	0.00069	0.0585	0.00379	0.165	0.0206
iron, total	7439-89-6	E420	0.010	mg/L	0.025	0.042	0.050	0.042	0.042
lead, total	7439-92-1	E420	0.000050	mg/L	0.000062	0.00382	0.000414	0.00192	0.000190
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	0.0070	<0.0010	<0.0010	<0.0010
magnesium, total	7439-95-4	E420	0.0050	mg/L	0.294	0.868	0.279	0.383	0.286
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00021	0.00043	0.00043	0.00137	0.00037
mercury, total	7439-97-6	E508	0.0000050	mg/L	----	<0.0000050	----	<0.0000050	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000450	0.000417	0.000434	0.000396	0.000407
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	0.00082	<0.00050	0.00752	<0.00050
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 8 of 14
 Work Order : VA20A3442
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Water
 (Matrix: Water)

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Lions Bay Ave (After Flush)	Kelvin Grove (First Draw)	Kelvin Grove (After Flush)	Community Centre (First Draw)	Community Centre (After Flush)
Client sampling date / time					17-Mar-2020 12:30	17-Mar-2020 07:50	17-Mar-2020 07:50	17-Mar-2020 06:20	17-Mar-2020 06:20	
Analyte	CAS Number	Method	LOR	Unit	VA20A3442-006	VA20A3442-007	VA20A3442-008	VA20A3442-009	VA20A3442-010	
					Result	Result	Result	Result	Result	
Total Metals										
potassium, total	7440-09-7	E420	0.050	mg/L	0.100	0.090	0.083	0.085	0.080	
rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
silicon, total	7440-21-3	E420	0.10	mg/L	2.39	2.42	2.44	2.35	2.44	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	
sodium, total	7440-23-5	E420	0.050	mg/L	1.92	2.25	1.98	1.98	2.04	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.00734	0.00660	0.00666	0.00730	0.00681	
sulfur, total	7704-34-9	E420	0.50	mg/L	0.56	<0.50	<0.50	0.56	0.56	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	0.0169	<0.00010	
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000041	0.000031	0.000042	0.000018	0.000034	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	0.0270	<0.0030	0.461	0.0035	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	----	<2.0	----	<2.0	----	
Trihalomethanes										
bromodichloromethane	75-27-4	E611B	1.0	µg/L	----	<1.0	----	<1.0	----	
bromoform	75-25-2	E611B	1.0	µg/L	----	<1.0	----	<1.0	----	
chloroform	67-66-3	E611B	1.0	µg/L	----	29.1	----	29.6	----	
dibromochloromethane	124-48-1	E611B	1.0	µg/L	----	<1.0	----	<1.0	----	
trihalomethanes [THMs], total	----	E611B	2.0	µg/L	----	29.1	----	29.6	----	
Trihalomethanes Surrogates										
bromofluorobenzene, 4-	480-00-4	E611B	1.0	%	----	99.1	----	100.0	----	
difluorobenzene, 1,4-	540-36-3	E611B	1.0	%	----	89.7	----	92.9	----	

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 3 of 14
 Work Order : VA20A3442
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Surface Water
 (Matrix: Water)

Client sample ID

					Harvey Raw Water (After Flush)	Magnesia Raw Water (After Flush)	----	----	----
Client sampling date / time					17-Mar-2020 10:15	17-Mar-2020 09:15	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20A3442-017	VA20A3442-018	-----	-----	-----
					Result	Result	----	----	----
Physical Tests									
absorbance, UV (@ 254nm)	----	E404	0.0050	Abs/cm	0.0270	0.0150	----	----	----
alkalinity, total (as CaCO ₃)	----	E290	1.0	mg/L	6.2	5.1	----	----	----
hardness (as CaCO ₃), from total Ca/Mg	----	EC100A	0.60	mg/L	6.25	15.2	----	----	----
pH	----	E108	0.10	pH units	6.95	6.89	----	----	----
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	<3.0	<3.0	----	----	----
turbidity	----	E121	0.10	NTU	<0.10	<0.10	----	----	----
transmittance, UV (@ 254nm)	----	E404	1.0	% T/cm	94.0	96.6	----	----	----
Organic / Inorganic Carbon									
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.19	0.85	----	----	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0248	0.0168	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	0.00141	0.00198	----	----	----
beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	----	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	0.0000536	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	2.06	5.03	----	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L	0.00053	0.00414	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	0.000090	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L	0.267	0.638	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00012	0.00058	----	----	----
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 4 of 14
 Work Order : VA20A3442
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Surface Water

(Matrix: Water)

					Client sample ID	Harvey Raw Water (After Flush)	Magnesia Raw Water (After Flush)	----	----	----
					Client sampling date / time	17-Mar-2020 10:15	17-Mar-2020 09:15	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20A3442-017	VA20A3442-018	-----	-----	-----	-----
					Result	Result	----	----	----	----
Total Metals										
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000460	0.000218	----	----	----	----
nickel, total	7440-02-0	E420	0.000050	mg/L	<0.00050	<0.00050	----	----	----	----
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	----	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L	0.074	0.072	----	----	----	----
rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000200 ^(L)	<0.000250 ^(L)	----	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L	2.29	5.06	----	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	----
sodium, total	7440-23-5	E420	0.050	mg/L	0.841	2.00	----	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	0.00586	0.0271	----	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	0.65	4.75	----	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	----	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000034	<0.000010	----	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	----	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	----
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

SEPTEMBER 17, 2019 RESULTS

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 3 of 14
 Work Order : VA20B5872
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Surface Water

Client sample ID

(Matrix: Water)

					Harvey Raw Water	Magnesia Raw Water	----	----	----
Client sampling date / time					22-Sep-2020 11:20	22-Sep-2020 09:30	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20B5872-017	VA20B5872-019	-----	-----	-----
					Result	Result	----	----	----
Physical Tests									
absorbance, UV (@ 254nm)	----	E404	0.0050	Abs/cm	0.0350	0.0220	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	7.0	5.5	----	----	----
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	7.25	16.9	----	----	----
pH	----	E108	0.10	pH units	7.06	6.83	----	----	----
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	<3.0	<3.0	----	----	----
turbidity	----	E121	0.10	NTU	<0.10	<0.10	----	----	----
transmittance, UV (@ 254nm)	----	E404	1.0	% T/cm	92.2	95.1	----	----	----
Organic / Inorganic Carbon									
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.25	0.88	----	----	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0234	0.0158	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00012	0.00014	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	0.00235	0.00262	----	----	----
beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	0.011	----	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000088	0.0000232	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	2.42	5.75	----	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L	0.00084	0.00629	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	0.000158	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L	0.290	0.610	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00015	0.00038	----	----	----
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000564	0.000254	----	----	----

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 4 of 14
 Work Order : VA20B5872
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Surface Water

Client sample ID

(Matrix: Water)

					Harvey Raw Water	Magnesia Raw Water	----	----	----
Client sampling date / time					22-Sep-2020 11:20	22-Sep-2020 09:30	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20B5872-017	VA20B5872-019	-----	-----	-----
					Result	Result	----	----	----
Total Metals									
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L	0.128	0.092	----	----	----
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00030	<0.00020	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	0.000122	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L	2.40	4.76	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----
sodium, total	17341-25-2	E420	0.050	mg/L	0.974	1.94	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	0.00720	0.0296	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	0.51	5.18	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000034	<0.000010	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----
Aggregate Organics									
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 5 of 14
 Work Order : VA20B5872
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Water

Client sample ID

(Matrix: Water)

					Harvey Tank (First Draw)	Harvey Tank (After Flush)	Store / Cafe (First Draw)	Store / Cafe (After Flush)	Lions Bay Ave. (First Draw)
Client sampling date / time					22-Sep-2020 11:15	22-Sep-2020 11:15	22-Sep-2020 07:35	22-Sep-2020 07:35	22-Sep-2020 11:45
Analyte	CAS Number	Method	LOR	Unit	VA20B5872-001	VA20B5872-002	VA20B5872-003	VA20B5872-004	VA20B5872-005
					Result	Result	Result	Result	Result
Physical Tests									
alkalinity, total (as CaCO ₃)	----	E290	1.0	mg/L	7.4	----	7.3	----	7.1
hardness (as CaCO ₃), from total Ca/Mg	----	EC100A	0.60	mg/L	7.56	----	8.38	----	7.62
pH	----	E108	0.10	pH units	7.05	----	7.05	----	7.09
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	<3.0	----	<3.0	----	<3.0
turbidity	----	E121	0.10	NTU	<0.10	----	<0.10	----	<0.10
Organic / Inorganic Carbon									
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.26	----	1.15	----	1.20
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0571	0.0264	0.0242	0.0262	0.0248
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00011	0.00012	0.00012	0.00010	0.00012
barium, total	7440-39-3	E420	0.00010	mg/L	0.00274	0.00258	0.00300	0.00227	0.00267
beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000066	<0.0000050	<0.0000050	<0.0000050	0.0000069
calcium, total	7440-70-2	E420	0.050	mg/L	2.52	2.48	2.88	2.63	2.55
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
copper, total	7440-50-8	E420	0.00050	mg/L	0.153	0.00546	0.0880	0.00965	0.0849
iron, total	7439-89-6	E420	0.010	mg/L	0.030	<0.010	0.037	0.067	<0.010
lead, total	7439-92-1	E420	0.000050	mg/L	0.00121	0.000070	0.000598	0.000150	0.00226
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
magnesium, total	7439-95-4	E420	0.0050	mg/L	0.309	0.302	0.290	0.287	0.304
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00105	0.00020	0.00164	0.00076	0.00025
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	----	<0.0000050	----	<0.0000050
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000542	0.000583	0.000539	0.000573	0.000576
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00302
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, total	7440-09-7	E420	0.050	mg/L	0.145	0.133	0.148	0.138	0.138

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 6 of 14
 Work Order : VA20B5872
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Water

Client sample ID

(Matrix: Water)

					Harvey Tank (First Draw)	Harvey Tank (After Flush)	Store / Cafe (First Draw)	Store / Cafe (After Flush)	Lions Bay Ave. (First Draw)
Client sampling date / time					22-Sep-2020 11:15	22-Sep-2020 11:15	22-Sep-2020 07:35	22-Sep-2020 07:35	22-Sep-2020 11:45
Analyte	CAS Number	Method	LOR	Unit	VA20B5872-001	VA20B5872-002	VA20B5872-003	VA20B5872-004	VA20B5872-005
					Result	Result	Result	Result	Result
Total Metals									
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00042	0.00038	0.00033	0.00035	0.00036
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000068	0.000075	0.000058	0.000078	0.000068
silicon, total	7440-21-3	E420	0.10	mg/L	2.30	2.30	2.48	2.25	2.40
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, total	17341-25-2	E420	0.050	mg/L	2.36	2.36	2.38	2.41	2.40
strontium, total	7440-24-6	E420	0.00020	mg/L	0.00794	0.00762	0.00920	0.00799	0.00778
sulfur, total	7704-34-9	E420	0.50	mg/L	0.60	0.69	0.78	0.51	0.51
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00012
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00106	<0.00030	<0.00030	<0.00030	<0.00030
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000032	0.000033	0.000020	0.000031	0.000029
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0305	<0.0030	0.107	<0.0030	0.0164
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Aggregate Organics									
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	----	<2.0	----	<2.0
Volatile Organic Compounds [THMs]									
bromodichloromethane	75-27-4	E611B	1.0	µg/L	<1.0	----	<1.0	----	<1.0
bromoform	75-25-2	E611B	1.0	µg/L	<1.0	----	<1.0	----	<1.0
chloroform	67-66-3	E611B	1.0	µg/L	23.1	----	29.6	----	32.3
dibromochloromethane	124-48-1	E611B	1.0	µg/L	<1.0	----	<1.0	----	<1.0
trihalomethanes [THMs], total	----	E611B	2.0	µg/L	23.1	----	29.6	----	32.3
Volatile Organic Compounds [THMs] Surrogates									
bromofluorobenzene, 4-	460-00-4	E611B	1.0	%	86.3	----	88.4	----	87.2
difluorobenzene, 1,4-	540-36-3	E611B	1.0	%	95.8	----	96.1	----	94.7

Please refer to the General Comments section for an explanation of any qualifiers detected.

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 7 of 14
 Work Order : VA20B5872
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Water
 (Matrix: Water)

Client sample ID

					Lions Bay Ave. (After Flush)	Kelvin Grove (First Draw)	Kelvin Grove (After Flush)	Community Centre (First Draw)	Community Centre (After Flush)
Client sampling date / time					22-Sep-2020 11:45	22-Sep-2020 05:40	22-Sep-2020 05:40	22-Sep-2020 06:35	22-Sep-2020 06:35
Analyte	CAS Number	Method	LOR	Unit	VA20B5872-006	VA20B5872-007	VA20B5872-008	VA20B5872-009	VA20B5872-010
					Result	Result	Result	Result	Result
Physical Tests									
alkalinity, total (as CaCO ₃)	----	E290	1.0	mg/L	----	8.3	----	7.3	----
hardness (as CaCO ₃), from total Ca/Mg	----	EC100A	0.60	mg/L	----	9.86	----	7.56	----
pH	----	E108	0.10	pH units	----	7.19	----	6.99	----
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	----	<3.0	----	<3.0	----
turbidity	----	E121	0.10	NTU	----	<0.10	----	<0.10	----
Organic / Inorganic Carbon									
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	----	1.18	----	1.10	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0289	0.0325	0.0343	0.0072	0.0315
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00012	0.00011	0.00013	0.00010	0.00013
barium, total	7440-39-3	E420	0.00010	mg/L	0.00260	0.00286	0.00276	0.00304	0.00230
beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
bismuth, total	7440-69-9	E420	0.000050	mg/L	0.000073	<0.000050	<0.000050	0.00325	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	0.0000064	<0.0000050	0.0000667	<0.0000050
calcium, total	7440-70-2	E420	0.050	mg/L	2.67	3.37	3.19	2.24	2.76
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	0.00225	<0.00010
copper, total	7440-50-8	E420	0.00050	mg/L	0.00154	0.0252	0.00187	0.159	0.0390
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	0.072	0.106	0.023	0.056
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	0.00333	0.000412	0.00174	0.000419
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
magnesium, total	7439-95-4	E420	0.0050	mg/L	0.304	0.348	0.250	0.476	0.275
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00017	0.00059	0.00098	0.00173	0.00065
mercury, total	7439-97-6	E508	0.0000050	mg/L	----	<0.0000050	----	<0.0000050	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000589	0.000597	0.000572	0.000127	0.000559
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	0.00077	<0.00050	0.0689	<0.00050
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050

Lions Bay Drinking Water Quality 2020 Annual Report

Page : 8 of 14
 Work Order : VA20B5872
 Client : Village of Lions Bay
 Project : ----



Analytical Results

Sub-Matrix: Water
 (Matrix: Water)

Client sample ID

					Lions Bay Ave. (After Flush)	Kelvin Grove (First Draw)	Kelvin Grove (After Flush)	Community Centre (First Draw)	Community Centre (After Flush)
Client sampling date / time					22-Sep-2020 11:45	22-Sep-2020 05:40	22-Sep-2020 05:40	22-Sep-2020 06:35	22-Sep-2020 06:35
Analyte	CAS Number	Method	LOR	Unit	VA20B5872-006	VA20B5872-007	VA20B5872-008	VA20B5872-009	VA20B5872-010
					Result	Result	Result	Result	Result
Total Metals									
potassium, total	7440-09-7	E420	0.050	mg/L	0.142	0.138	0.135	0.090	0.137
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00042	0.00037	0.00032	0.00022	0.00033
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000075	0.000055	0.000064	0.000087	0.000072
silicon, total	7440-21-3	E420	0.10	mg/L	2.30	2.44	2.44	0.81	2.34
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	0.000013	<0.000010
sodium, total	17341-25-2	E420	0.050	mg/L	2.36	2.28	2.35	2.13	2.33
strontium, total	7440-24-6	E420	0.00020	mg/L	0.00807	0.00870	0.00813	0.00787	0.00853
sulfur, total	7704-34-9	E420	0.50	mg/L	0.54	0.69	0.65	<0.50	0.65
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	0.000076	<0.000010
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	0.0998	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000035	0.000027	0.000035	<0.000010	0.000031
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	0.0181	<0.0030	3.78	0.0084
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Aggregate Organics									
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	----	<2.0	----	<2.0	----
Volatile Organic Compounds [THMs]									
bromodichloromethane	75-27-4	E611B	1.0	µg/L	----	<1.0	----	<1.0	----
bromoform	75-25-2	E611B	1.0	µg/L	----	<1.0	----	<1.0	----
chloroform	67-66-3	E611B	1.0	µg/L	----	42.2	----	34.6	----
dibromochloromethane	124-48-1	E611B	1.0	µg/L	----	<1.0	----	<1.0	----
trihalomethanes [THMs], total	----	E611B	2.0	µg/L	----	42.2	----	34.6	----
Volatile Organic Compounds [THMs] Surrogates									
bromofluorobenzene, 4-	480-00-4	E611B	1.0	%	----	88.1	----	86.3	----
difluorobenzene, 1,4-	540-36-3	E611B	1.0	%	----	96.8	----	95.6	----

APPENDIX H – METRO VANCOUVER AVERAGE ANNUAL DAILY CONSUMPTION

GREATER VANCOUVER WATER DISTRICT
ANNUAL AVERAGE DAILY FLOWS
[Lpcd]

JURISDICTION	2015	2016	2017	2018	2019
ANMORE	323	336	392	371	391
BELCARRA	207	256	363	290	315
BURNABY	464	445	447	440	420
COQUITLAM	336	329	372	363	356
DELTA	625	620	608	600	608
LANGLEY CITY	396	389	379	371	335
LANGLEY TOWNSHIP (4)	406	380	389	392	388
MAPLE RIDGE (2)	390	363	373	370	355
NEW WESTMINSTER	335	318	317	311	296
NORTH VAN. CITY	416	436	461	425	408
NORTH VAN. DIST.	580	575	595	602	583
PITT MEADOWS	476	447	534	511	488
PORT COQUITLAM	409	403	415	426	404
PORT MOODY	389	362	377	382	378
RICHMOND	463	460	457	456	443
SURREY	338	341	329	327	320
TFN	325	816	548	705	699
UEL (1)	798	803	718	714	682
VANCOUVER	477	459	458	454	437
WEST VANCOUVER (5)	569	579	572	530	487
TOTAL SYSTEM (3)	438	435	440	434	424

- (1) Per capita flows are high because the calculation is (UBC + UEL Flow) / (UEL + a portion of UBC population).
- (2) Although jurisdiction has its own secondary supply source(s), total jurisdiction population has been used to calculate per capita consumption (see Notes section).
- (3) See " Notes - Per Capita Consumption " in Notes section for population figures used to compute system per capita consumption.
- (4) As Township of Langley has its own secondary supply sources, the GVWD service population was used to compute per capita consumption (see Notes section).
- (5) Starting with 2017 Consumption Statistics Report, GVWD service population will be used to calculate District of West Vancouver's per capita flows from 1995 and onwards.