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## WATER TREATMENT PLANT & DISTRIBUTION SYSTEM

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## 2019 Annual Operations Performance Report

Facility Numbers 529 & 155

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## OVERVIEW

Port Hardy, with a population of 4,132 residents and over 5,000 connected to the infrastructure is located at the northern end of Vancouver Island. In May 2000 the water treatment plant was commissioned and established Port Hardy's reputation for having some of British Columbia's best water quality.

Port Hardy's source water is the Tsulquate River. The water from this river is tinted brown from tannins and other leachates. Port Hardy's Water Treatment Plant uses a Dissolved Air Flotation (DAF) system which is very effective in treating highly colored water. Treatment is achieved using ISOPAC 6 and Soda Ash to remove the color, particles, sediment and organics that are present. A filter aid, Hydrofloc 400 is added in trace amounts after the DAF treatment and prior to the filters to improve coagulation of fine particles. Filtration is done through a mixed media consisting silica sand and anthracite. Lime slurry, carbon dioxide and sodium hypochlorite are injected post filtration for alkalinity, pH adjustment and disinfection.

In 2019, the plant continued to produce a very high level of treatment providing excellent water quality to the District of Port Hardy.

## PERMIT TO OPERATE

The Port Hardy water treatment plant is a Level III facility as deemed by the Environmental Operators Certification Program (EOCP), certification number 529. The distribution system is a Level III system with a certification number of 155.

## CERTIFIED OPERATORS

The Operational Permit from Vancouver Island Health Authority Operational requires that a certified operator is employed to match the Water Treatment Plant Certification, a level III plant. The District currently employs a Level IV operator and two, Level III operators. The District also employs a Level III Water Distribution Operator.

Operator	Title	Certification
Joe Jewell	Utilities Supervisor	WT IV, WD III, WWT II, WWC I
Justin Reusch	Chief Operator	WT III, WD II, WWT II
Roland LeFort	Operator	WWT III, WT III
Cory Henschke	Operator	WWT I, WD II
Robert Cousins	Operator	WT I, WWT I, Cross Connection

## OPERATIONAL HIGHLIGHTS

### WATER TREATMENT PLANT

Throughout 2019, there were times where due to heavy rains and high river colour events, that the water treatment process was upset. In these events, the plant is taken offline and no water is pumped to the reservoir. Water is only pumped to the reservoirs once the treatment plant's process quality is restored. This will result in lower than desired reservoir levels but quality will not be compromised.

### CAPITAL PROJECTS

Many capital projects were undertaken in 2019 including:

- New air compressor heads were purchased to replace the original equipment
- New chemical feed pumps were purchased for both ISOPAC 6 and Soda Ash. The new pumps were upgraded in size and each new pump replaces two old pumps. Now, one pump will be used as a duty pump and a spare on standby
- A new particle counter was purchased for the DAF
- A tee and check valve were installed in Reservoir #1. This allows for operators to perform filter backwashes while the plant is offline

Additional highlights:

- No violations to permit in 2019
- Quarterly samples for THMs and HAAs all returned within acceptable limits
- All bacteriological testing came back within expected parameters
- A Stage 1 water use restriction as per Port Hardy Water Conservation Bylaw No. 06-2005
- Investigation of water leaks in the Upper Carnarvon/Carnarvon Place area are ongoing. Several locations have been tested and repaired but further work and leak detection equipment is required
- Chlorine injection lines were repaired at the Fort Rupert Reservoir in September
- All emergency generators were serviced and load bank tested this year as part of annual maintenance. Some minor follow-up maintenance was required on some units but all generators are running reliably

## WATER DISTRIBUTION SYSTEM

In 2019, the District of Port Hardy commenced on a major upgrade to the water distribution system in the Storey's Beach area. A new 2000 cubic meter (m<sup>3</sup>) reservoir was constructed on Fort Rupert Road and 3000 meters of distribution pipe was replaced. The replacement distribution pipe was also increased in size from 150mm and 250mm to 300mm and 350mm. Additional hydrants were also installed ensuring a fire flow of 150 Litres/second where required. The Fort Rupert Reservoir site is equipped with backup power generation and chlorine disinfection booster pumps. The reservoir level is controlled by an altitude control valve which keeps the tank at a predetermined level within 1.5 meters. A rolling diaphragm pressure reducing valve is also installed on site to regulate the pressure in the event the reservoir is offline. The entire site can be monitored remotely from the water treatment.

## CAPITAL PROJECTS

In 2019, the following projects were completed

- A new parking area was built for the Hydro excavation truck. This permanent bay will keep the truck's sensitive electronics from failing and reduces the cost of maintenance and less downtime
- A new controller was installed on the altitude control valve at Fort Rupert Reservoir. This will keep the reservoir from filling too quickly and reduce strain on the rest of distribution system
- Water main clearing continued to keep our infrastructure accessible
- A new trash rack and level system were purchased for the Kains Lake Dam
- Revisions to the mapping continued in 2019. The new maps have been delivered to the operators and edits and additions are underway

Additional Highlights:

- The Storey's Beach PRV was brought online in January
- The emergency power generator was commissioned at Fort Rupert Reservoir
- An air valve was repaired on Duval Forest Service Road
- Water mainline valves are being located around the District. Many of these valve boxes are below grade and are difficult to find and get filled with debris. Utilities staff have been cleaning out the valve boxes, and bringing them up to grade with riser rings in order to keep them clean and easier to locate in an emergency
- Several water leaks were addressed in the system this year both on District land and private. Letters are sent to property owners stating that they must be addressed
- All fire hydrants were "B" Serviced this year

## CROSS CONNECTION CONTROL

A formal Cross Connection Control program created by Maintenance Tracking Systems Inc (MTS) was presented to the District of Port Hardy in late 2010. Currently, backflow preventers are installed in all high risk areas of the treatment plants, liftstations with a washdown hose, public sani dumps and public gardens.

## WATER WISE PROGRAM CONTINUATION

A total of 178 meters are being read including commercial users and multi-family dwellings. All new homes and constructions will have meter setters installed as part of this program. Continuing public education around proposed metering/rate changes and general information on water wise initiatives was conducted and will be ongoing until all users are metered. In 2016, new watering restrictions as per Port Hardy Water Conservation Bylaw No. 06-2005 were adopted. As part of the water system upgrade in 2018, water meter setters were installed on all single-family dwellings on Beaver Harbour Road as new service lines were run to the property line.

In 2019, 6 new meters were installed on commercial properties and 4 faulty meters were replaced.

## WATERSHED PROTECTION PLAN

The District of Port Hardy has taken steps to implement a watershed protection plan. The purpose of this is to create a plan that guides users in the best management and preservation of the Tsulquate River and Kains Lake watershed as a drinking water source for the District of Port Hardy. The plan will develop a public awareness, identify stakeholders, increase knowledge and public awareness of the watershed and develop procedures for an emergency response.

Water Treatment Plant / Distribution Testing													
	January	February	March	April	May	June	July	August	September	October	November	December	Total
Raw Water pH	26	24	26	26	27	25	27	26	26	27	25	27	312
Reservoir Water pH Daily Grab Sample or Continuous 6.5 - 8.5	31	28	31	30	31	30	31	31	30	31	30	31	365
Colour (Reservoir) AO: <= 15 TCU	26	24	26	26	27	25	27	26	27	27	25	27	313
Free Chlorine Residual (Reservoir) Daily Grab Sample or Continuous	31	28	31	30	31	30	31	31	30	31	30	31	365
Free Chlorine Residual Distribution Grab Sample	42	44	42	42	45	42	44	44	42	44	42	42	515
Turbidity (Distribution) Grab Samples	42	44	42	42	45	42	44	44	42	44	42	42	515
Turbidity (Filter) Grab Sample or Continuous <= 0.3 NTU in at least 95%; never > 1.0 NTU	31	28	31	30	31	30	31	31	30	31	30	31	365
Turbidity (Reservoir) Daily Grab Sample or Continuous 1 NTU Maximum in finished water	31	28	31	30	31	30	31	31	30	31	30	31	365
Escherichia Coli ( <i>E.coli</i> ) 11 per month Distribution, 1 Raw MAC: 0 CFU/100mL	12	12	12	12	12	12	14	12	12	12	12	12	146
Total Coliforms 11 per month Distribution, 1 Raw MAC: 0 CFU/100mL	12	12	12	12	12	12	14	12	12	12	12	12	146
Chemical and Physical Parameter Tests Once every 5 years													0
Trihalomethanes & Haloacetic Acids (THMs & HAAs) Quarterly <0.100 mg/L annual average	1			1			1			1			4
Monthly Report 15 <sup>th</sup> of the following month	1	1	1	1	1	1	1	1	1	1	1	1	12
Annual Report Before January 31 <sup>st</sup>	1												1
Permit Violations	0	0	0	0	0	0	0	0	0	0	0	0	0
Workplace Metrics													
	January	February	March	April	May	June	July	August	September	October	November	December	Total
Safety Meetings	1	1	1	1	1	1	1	1	1	1	1	1	12
Worksite Inspections	1	1	1	1	1	1	1	1	1	1	1	1	12
Kain's Lake Dam Inspections	2	2	2	2	8	6	8	2	7	6	4	2	51
Water Service Locates	2	4	2	2	7	2	40	0	0	2	2	2	65
Water Service Repairs	1	2	1	1	7	0	2	0	0	0	4	2	20
Water Main Repairs	0	0	0	0	0	0	0	0	0	0	0	0	0
BC One Calls	8	2	0	2	4	34	10	2	6	4	2	1	75
PRV Inspections	0	0	7	0	7	0	0	0	7	0	0	0	21
ERP Exercises	0	0	0	0	0	0	0	0	0	0	0	0	0
Air Valve Inspections	1	0	0	0	6	0	0	0	0	0	1	0	8
Mainline Valve Locates/Inspections	4	4	4	6	6	4	4	0	0	0	0	0	32
Hydrant A - Services	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydrant B - Services	0	0	0	0	34	106	0	0	23	29	21	0	213

## RAW AND TREATED WATER PRODUCTION

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Raw Water Pumped in ML	117	137	132	114	130	132	145	146	136	137	131	135	1591
Treated Water Production in ML	116	133	129	111	127	127	139	141	132	133	128	135	1549
Rainfall in mm	225	28	43	110	16.8	43.6	95.6	56.4	104.6	183	175.2	281.2	1363
Backwashes	36	31	34	34	36	34	36	38	36	37	32	35	419

## CHEMICAL USAGE

	January	February	March	April	May	June	July	August	September	October	November	December	Total
ISOPAC 6 Coagulant in kg	3533	2744	2396	2595	1630	2059	3581	3603	4606	5436	4790	5027	42000
Soda Ash in kg	1725	1226	1180	1158	817	726	1407	1521	1612	2020	1861	1816	17070
Filter Aid (LT20) in kg	0.78	0.97	0.94	0.74	0.81	0.82	0.90	0.89	0.86	0.89	0.88	0.75	10.22
Salt for Chlorine Generator in kg	360	400	540	360	380	394	620	860	740	1120	660	900	7334
Liquid Sodium Hypochlorite 12% in kg	20	0	0	0	0	0	0	0	0	0	0	151	171
Lime in kg	1831	1652	1755	1913	1976	1874	1956	1912	1690	1670	1579	1920	21727
Carbon Dioxide in kg	2277	2368	2477	2385	2680	2987	3017	2247	3072	2923	2134	82	28649



## FILTERED WATER QUALITY

Month	Filter 1		Filter 2		Filter 3		Filter 4	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
January	0.03	0.29	0.04	0.29	0.03	0.29	0.02	0.29
February	0.03	0.29	0.04	0.29	0.04	0.29	0.03	0.29
March	0.03	0.29	0.03	0.29	0.04	0.29	0.03	0.29
April	0.03	0.29	0.03	0.29	0.03	0.29	0.06	0.29
May	0.03	0.29	0.03	0.29	0.02	0.29	0.02	0.29
June	0.02	0.29	0.02	0.29	0.04	0.29	0.02	0.29
July	0.04	0.17	0.03	0.29	0.03	0.24	0.02	0.22
August	0.03	0.29	0.03	0.29	0.04	0.29	0.03	0.29
September	0.03	0.29	0.03	0.29	0.04	0.25	0.03	0.19
October	0.03	0.29	0.03	0.29	0.04	0.29	0.03	0.29
November	0.03	0.29	0.03	0.29	0.03	0.29	0.03	0.29
December	0.03	0.29	0.04	0.29	0.03	0.30	0.03	0.29
Average	0.03	0.28	0.03	0.29	0.03	0.28	0.03	0.28
Minimum	0.02	0.17	0.02	0.29	0.02	0.24	0.02	0.19
Maximum	0.04	0.29	0.04	0.29	0.04	0.30	0.06	0.29

## RESERVOIR EFFLUENT

Month	Flow (m <sup>3</sup> /hour)	Free Chlorine (mg/L)		pH		Turbidity (NTU)
	Avg	Avg	Max	Avg	Max	Avg
January	130	1.0	1.1	7.4	9.0	0.12
February	192	1.1	1.2	7.4	7.7	0.10
March	151	1.0	1.1	7.3	7.8	0.16
April	140	1.0	1.8	7.3	7.9	0.08
May	151	0.9	1.8	7.1	7.9	0.07
June	155	0.9	1.1	7.3	7.9	0.06
July	166	0.9	1.0	7.0	7.2	0.12
August	168	1.0	1.1	7.2	7.4	0.09
September	160	1.0	1.1	7.4	7.5	0.09
October	161	1.0	1.1	7.5	7.5	0.09
November	157	1.0	1.1	7.4	7.5	0.09
December	167	1.0	1.1	7.4	7.6	0.09
Avg	158	1.0	1.2	7.3	7.7	0.10
Min	130	0.9	1.0	7.0	7.2	0.06
Max	192	1.1	1.8	7.5	9.0	0.16

*Note: Data from the above tables are accumulated from online instrumentation and SCADA trending. Maximum values can be influenced by cleaning, calibrating and flushing of online instrumentation which at that time does not reflect the actual quality of the water.*

# DISTRIBUTION WATER QUALITY AND BACTERIOLOGICAL RESULTS

January					February					March				
Distribution Sampling					Distribution Sampling					Distribution Sampling				
Location	Date	Free Chlorine mg/L	Turbidity NTU	pH	Location	Date	Free Chlorine mg/L	Turbidity NTU	pH	Location	Date	Free Chlorine mg/L	Turbidity NTU	pH
Chatham Avenue	01/08/19	0.5	0.14	7.6										
	01/15/19	0.6	0.13	7.9										
	01/22/19	0.6	0.16	7.8										
	01/29/19	0.6	0.21	7.2										
Peel Street Liftstation	01/08/19	0.8	0.14	7.6										
	01/15/19	0.9	0.12	7.6										
	01/22/19	0.9	0.26	7.6										
	01/29/19	0.7	0.18	7.5										
Airport Wastewater Treatment Plant	01/08/19	0.8	0.13	7.5										
	01/15/19	0.7	0.16	7.7										
	01/22/19	0.6	0.32	7.6										
Public Works Yard	01/08/19	0.9	0.13	7.7										
	01/15/19	0.9	0.14	7.6										
	01/22/19	0.8	0.12	7.8										
	01/29/19	0.9	0.20	7.5										
Eagleview School	01/08/19	0.4	0.21	7.9										
	01/15/19	0.4	0.27	7.7										
	01/22/19	0.4	0.33	7.8										
	01/29/19	0.5	0.22	7.8										
Bear Cove Reservoir	01/08/19	0.8	0.14	7.6										
	01/15/19	0.8	0.14	7.6										
	01/22/19	0.7	0.15	7.6										
	01/29/19	0.7	0.15	7.5										
Ferry Terminal	01/08/19	0.6	0.14	7.7										
	01/15/19	0.7	0.15	7.7										
	01/22/19	0.7	0.13	7.6										
	01/29/19	0.7	0.18	7.5										
Highway 19 PRV	01/08/19	1.0	0.18	7.6										
	01/15/19	0.8	0.14	7.6										
	01/22/19	0.9	0.19	7.6										
	01/29/19	1.0	0.13	7.5										
Average		0.7	0.17	7.6										
Minimum		0.4	0.12	7.2										
Maximum		1.0	0.33	7.9										
Chatham Avenue	02/05/19	0.8	0.13	7.8										
	02/12/19	0.7	0.17	7.8										
	02/19/19	0.8	0.18	7.7										
	02/26/19	0.7	0.16	7.7										
Peel Street Liftstation	02/05/19	1.0	0.23	7.5										
	02/12/19	0.8	0.14	7.4										
	02/19/19	0.9	0.15	7.5										
	02/26/19	0.8	0.15	7.4										
Airport Wastewater Treatment Plant	02/05/19	0.5	0.48	7.7										
	02/12/19	0.6	0.28	7.5										
	02/19/19	0.6	0.61	7.6										
	02/26/19	0.5	0.30	7.5										
Public Works Yard	02/05/19	1.0	0.16	7.6										
	02/12/19	0.9	0.14	7.6										
	02/19/19	0.8	0.21	7.7										
	02/26/19	0.8	0.14	7.5										
Eagleview School	02/05/19	0.6	0.14	7.8										
	02/12/19	0.5	0.19	7.8										
	02/19/19	0.4	0.19	7.7										
	02/26/19	0.5	0.22	7.7										
Bear Cove Reservoir	02/05/19	0.8	0.15	7.6										
	02/12/19	0.9	0.18	7.5										
	02/19/19	0.8	0.17	7.6										
	02/26/19	0.9	0.20	7.5										
Ferry Terminal	02/05/19	0.7	0.13	7.7										
	02/12/19	0.8	0.12	7.4										
	02/19/19	1.0	0.16	7.5										
	02/26/19	0.9	0.21	7.4										
Highway 19 PRV	02/05/19	1.0	0.23	7.5										
	02/12/19	1.1	0.16	7.5										
	02/19/19	1.1	0.18	7.5										
	02/26/19	0.9	0.24	7.4										
Average		0.8	0.20	7.6										
Minimum		0.4	0.12	7.4										
Maximum		1.1	0.61	7.8										
Chatham Avenue	03/05/19	0.6	0.17	7.8										
	03/12/19	0.5	0.14	7.7										
	03/19/19	0.5	0.13	7.7										
	03/26/19	0.4	0.14	7.7										
Peel Street Liftstation	03/05/19	0.9	0.26	7.5										
	03/12/19	0.7	0.13	7.4										
	03/19/19	0.6	0.13	7.4										
	03/26/19	0.5	0.14	7.5										
Airport Wastewater Treatment Plant	03/05/19	0.4	0.46	7.7										
	03/12/19	0.4	0.61	7.4										
	03/19/19	0.6	0.16	7.5										
	03/26/19	0.5	0.24	7.5										
Public Works Yard	03/05/19	1.0	0.11	7.5										
	03/12/19	0.7	0.11	7.7										
	03/19/19	0.7	0.15	7.5										
	03/26/19	0.5	0.14	7.7										
Eagleview School	03/05/19	0.7	0.17	7.6										
	03/12/19	0.5	0.24	7.5										
	03/19/19	0.4	0.31	7.4										
	03/26/19	0.4	0.17	7.6										
Bear Cove Reservoir	03/05/19	0.7	0.11	7.5										
	03/12/19	0.8	0.18	7.5										
	03/19/19	0.8	0.17	7.3										
	03/26/19	0.7	0.16	7.5										
Ferry Terminal	03/05/19	0.7	0.37	7.5										
	03/12/19	0.7	0.13	7.4										
	03/19/19	0.6	0.11	7.5										
	03/26/19	0.5	0.15	7.5										
Highway 19 PRV	03/05/19	1.1	0.17	7.5										
	03/12/19	0.9	0.13	7.5										
	03/19/19	0.8	0.16	7.4										
	03/26/19	0.9	0.15	7.5										
Average		0.6	0.19	7.5										
Minimum		0.4	0.11	7.3										
Maximum		1.1	0.61	7.8										
Chatham Avenue	04/02/19	0.4	0.32	7.2										
	04/09/19	0.5	0.18	7.8										
	04/16/19	0.4	0.17	7.8										
	04/23/19	0.4	0.21	7.9										
Peel Street Liftstation	04/02/19	0.7	0.14	7.5										
	04/09/19	0.6	0.18	7.3										
	04/16/19	0.7	0.16	7.5										
	04/23/19	0.7	0.13	7.6										
Airport Wastewater Treatment Plant	04/02/19	0.5	0.27	7.6										
	04/09/19	0.6	0.15	7.6										
	04/16/19	0.6	0.27	7.5										
	04/23/19	0.5	0.25	7.6										
Public Works Yard	04/02/19	0.7	0.16	7.5										
	04/09/19	1.0	0.13	7.6										
	04/16/19	0.9	0.13	7.6										
	04/23/19	0.7	0.18	7.6										
Eagleview School	04/02/19	0.6	0.18	7.5										
	04/09/19	0.6	0.19	7.5										
	04/16/19	0.6	0.15	7.5										
	04/23/19	0.7	0.48	7.6										
Bear Cove Reservoir	04/02/19	0.5	0.21	7.6										
	04/09/19	0.8	0.14	7.5										
	04/16/19	1.0	0.18	7.3										
	04/23/19	0.7	0.15	7.5										
Ferry Terminal	04/02/19	0.7	0.26	7.6										
	04/09/19	0.7	0.17	7.5										
	04/16/19	0.5	0.30	7.2										
	04/23/19	0.6	0.29	7.4										
Highway 19 PRV	04/02/19	1.0	0.28	7.5										
	04/09/19	1.2	0.16	7.4										
	04/16/19	0.9	0.18	7.4										
	04/23/19	0.8	0.24	7.6										
Average		0.7	0.20	7.5										
Minimum		0.4	0.12	7.2										
Maximum		1.2	0.48	8.1										
Chatham Avenue	05/07/19	0.5	0.14	7.5										
	05/14/19	0.6	0.18	7.5										
	05/21/19	0.6	0.21	7.5										
	05/28/19	0.5	0.34	7.6										
Peel Street Liftstation	05/07/19	0.8	0.13	7.3										
	05/14/19	0.7	0.14	7.3										
	05/21/19	0.8	0.15	7.5										
	05/28/19	0.6	0.21	7.4										
Airport Wastewater Treatment Plant	05/07/19	0.5	0.23	7.4										
	05/14/19	0.6	0.15	7.4										
	05/21/19	0.7	0.21	7.5										
	05/28/19	0.6	0.26	7.5										
Public Works Yard	05/07/19	0.9	0.20	7.4										
	05/14/19	0.9	0.12	7.6										
	05/21/19	0.3	0.13	7.8										
	05/28/19	0.8	0.17	7.5										
Eagleview School	05/07/19	0.4	0.13	7.3										
	05/14/19	0.5	0.12	7.5										
	05/21/19	0.3	0.23	7.6										
	05/28/19	0.4	0.17	7.5										
Bear Cove Reservoir	05/07/19	0.8	0.18	7.3										
	05/14/19	0.9	0.15	7.5										
	05/21/19	0.7	0.15	7.4										
	05/28/19	0.7	0.13	7.4										
Ferry Terminal	05/07/19	0.5	0.17	7.4										
	05/14/19	0.5	0.15	7.5										
	05/21/19	0.4	0.15	7.4										
	05/28/19	0.6	0.15	7.4										
Highway 19 PRV	05/07/19	0.9	0.21	7.3										
	05/14/19	0.9	0.15	7.5										
	05/21/19	1.0	0.20	7.4										
	05/28/19	0.9	0.15	7.5										
Average		0.6	0.17	7.5										
Minimum		0.3	0.12	7.3										
Maximum		1.0	0.34	7.8										
Chatham Avenue	06/04/19	0.5	0.15	7.6										
	06/11/19	0.4	0.14	7.7										
	06/18/19	0.5	0.28	7.7										
	06/25/19	0.5	0.15	7.7										
Peel Street Liftstation	06/04/19	0.7	0.12	7.5										
	06/11/19	0.8	0.14	7.6										
	06/18/19	0.6	0.29	7.5										
	06/25/19	0.7	0.17	7.6										
Airport Wastewater Treatment Plant	06/04/19	0.6	0.14	7.4										
	06/11/19	0.6	0.23	7.5										
	06/18/19	0.5	0.20	7.5										
	06/25/19	0.5	0.24	7.6										
Public Works Yard	06/04/19	0.9	0.22	7.7										
	06/11/19	0.9	0.40	7.4										
	06/18/19	0.8	0.37	7.7										
	06/25/19	0.5	0.23	7.8										
Eagleview School	06/04/19	0.5	0.12	7.3										
	06/11/19	0.4	0.12	7.6										
	06/18/19	0.4	0.24	7.5										
	06/25/19	0.3	0.27	7.6										
Bear Cove Reservoir	06/04/19	0.8	0.13	7.5										
	06/11/19	0.8	0.20	7.6										
	06/18/19	0.8	0.36	7.5										
	06/25/19	0.7	0.17	7.7										
Ferry Terminal	06/04/19	0.8	0.28	7.3										
	06/11/19	0.4	0.14	7.5										
	06/18/19	0.6	0.33	7.4										
	06/25/19	0.8	0.30	7.5										
Highway 19 PRV	06/04/19	0.8	0.19	7.6										
	06/11/19	0.8	0.13	7.5										
	06/18/19	1.1	0.42	7.5										
	06/25/19	0.7	0.29	7.5										
Average		0.6	0.22	7.5										
Minimum		0.3	0.12	7.3										
Maximum		1.1	0.42	7.8										



January						
Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
01/08/19	Hospital	0.9	0.20	7.5	L1	L1
01/08/19	Airport Washroom	0.6	0.17	7.7	L1	L1
01/15/19	Chatham Ave.	0.6	0.13	7.9	L1	L1
01/15/19	Bear Cove Reservoir	0.8	0.14	7.6	L1	L1
01/15/19	Highway 19 PRV	0.8	0.14	7.6	L1	L1
01/08/19	Pioneer Inn	0.5	0.13	7.5	L1	L1
01/22/19	Public Works Yard	0.8	0.12	7.8	L1	L1
01/15/19	Glen Lyon Restaurant	0.7	0.12	7.6	L1	L1
01/22/19	Airport Inn	0.7	0.18	7.6	L1	L1
01/08/19	Peel St Liftstation	0.8	0.14	7.6	L1	L1
01/22/19	B.C. Ferry	0.7	0.13	7.6	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
01/22/19	Tsulquate River (Untreated)		0.47	6.6		

February						
Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
02/19/19	Hospital	0.8	0.40	7.6	L1	L1
02/05/19	Airport Washroom	0.9	0.24	7.6	L1	L1
02/19/19	Chatham Ave.	0.8	0.18	7.7	L1	L1
02/05/19	Bear Cove Reservoir	0.8	0.15	7.6	L1	L1
02/12/19	Highway 19 PRV	1.1	0.16	7.5	L1	L1
02/19/19	Pioneer Inn	0.7	0.14	7.5	L1	L1
02/12/19	Public Works Yard	0.9	0.14	7.6	L1	L1
02/12/19	Glen Lyon Restaurant	1.0	0.14	7.5	L1	L1
02/19/19	Airport Inn	0.8	0.16	7.5	L1	L1
02/05/19	Peel St Liftstation	1.0	0.23	7.5	L1	L1
02/12/19	B.C. Ferry	0.8	0.12	7.4	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
02/05/19	Tsulquate River (Untreated)		0.49	6.8		

March						
Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
03/12/19	Hospital	0.7	0.16	7.5	L1	L1
03/05/19	Airport Washroom	0.4	0.52	7.7	L1	L1
03/12/19	Chatham Ave.	0.5	0.14	7.7	L1	L1
03/05/19	Bear Cove Reservoir	0.7	0.11	7.5	L1	L1
03/19/19	Highway 19 PRV	0.8	0.16	7.4	L1	L1
03/19/19	Pioneer Inn	0.5	0.13	7.3	L1	L1
03/12/19	Public Works Yard	0.7	0.11	7.7	L1	L1
03/19/19	Glen Lyon Restaurant	0.7	0.13	7.4	L1	L1
03/12/19	Airport Inn	0.7	0.14	7.5	L1	L1
03/05/19	Peel St Liftstation	0.9	0.26	7.5	L1	L1
03/19/19	B.C. Ferry	0.6	0.11	7.5	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
03/05/19	Tsulquate River (Untreated)		0.40	6.7		

April						
Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
04/02/19	Hospital	0.8	0.21	7.6	L1	L1
04/02/19	Airport Washroom	0.5	0.45	7.5	L1	L1
04/02/19	Chatham Ave.	0.4	0.32	7.2	L1	L1
04/09/19	Bear Cove Reservoir	1.0	0.18	7.3	L1	L1
04/09/19	Highway 19 PRV	1.2	0.16	7.4	L1	L1
04/16/19	Pioneer Inn	0.7	0.17	7.5	L1	L1
04/09/19	Public Works Yard	1.0	0.13	7.6	L1	L1
04/16/19	Glen Lyon Restaurant	0.7	0.20	7.5	L1	L1
04/16/19	Airport Inn	0.6	0.13	7.4	L1	L1
04/16/19	Peel St Liftstation	0.7	0.16	7.5	L1	L1
04/02/19	B.C. Ferry	0.5	0.30	7.2	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
04/09/19	Tsulquate River (Untreated)		0.50	6.6		

May						
Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
05/07/19	Hospital	0.8	0.17	7.3	L1	L1
05/07/19	Airport Washroom	0.4	0.18	7.2	L1	L1
05/07/19	Chatham Ave.	0.5	0.14	7.5	L1	L1
05/14/19	Bear Cove Reservoir	0.9	0.15	7.5	L1	L1
05/14/19	Highway 19 PRV	0.9	0.15	7.5	L1	L1
05/14/19	Pioneer Inn	0.9	0.23	7.4	L1	L1
05/21/19	Public Works Yard	0.3	0.13	7.8	L1	L1
05/07/19	Glen Lyon Restaurant	0.7	0.53	7.3	L1	L1
05/14/19	Airport Inn	0.6	0.12	7.4	L1	L1
05/21/19	Peel St Liftstation	0.8	0.15	7.5	L1	L1
05/21/19	B.C. Ferry	0.4	0.15	7.4	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
05/21/19	Tsulquate River (Untreated)		0.31	7.2		

June						
Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
06/04/19	Hospital	0.8	0.15	7.5	L1	L1
06/04/19	Airport Washroom	0.5	0.22	7.5	L1	L1
06/04/19	Chatham Ave.	0.5	0.15	7.6	L1	L1
06/18/19	Bear Cove	0.8	0.36	7.5	L1	L1
06/18/19	Highway 19 PRV	1.1	0.42	7.5	L1	L1
06/04/19	Pioneer Inn	0.8	0.13	7.6	L1	L1
06/18/19	Public Works Yard	0.8	0.37	7.7	L1	L1
06/11/19	Glen Lyon Restaurant	0.6	0.28	7.5	L1	L1
06/11/19	Airport Inn	0.5	0.15	7.6	L1	L1
06/11/19	Peel St Liftstation	0.8	0.14	7.6	L1	L1
06/11/19	B.C. Ferry	0.4	0.14	7.5	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
06/18/19	Tsulquate River (Untreated)		0.25	7.3		

**July**

Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
07/09/19	Hospital	0.7	0.16	7.6	L1	L1
07/09/19	Airport Washroom	0.5	0.40	7.5	L1	L1
07/09/19	Chatham Ave.	0.6	0.31	7.6	L1	L1
07/16/19	Bear Cove Reservoir	0.5	0.22	7.5	L1	L1
07/23/19	Highway 19 PRV	1.0	0.21	7.3	L1	L1
07/09/19	Pioneer Inn	0.8	0.17	7.4	L1	L1
07/16/19	Public Works Yard	0.3	0.17	7.8	L1	L1
07/16/19	Glen Lyon Restaurant	0.6	0.22	7.4	L1	L1
07/16/19	Airport Inn	0.3	0.16	7.5	L1	L1
07/23/19	Peel St Liftstation	0.5	0.36	7.6	L1	L1
07/23/19	B.C. Ferry	0.3	0.28	7.3	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
07/23/19	Tsulquate River (Untreated)		0.39	7.0		

**September**

Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
09/10/19	Hospital	0.4	0.20	7.4	L1	L1
09/17/19	Airport Washroom	0.1	0.34	7.2	L1	L1
09/03/19	Chatham Ave.	0.3	0.18	7.6	L1	L1
09/03/19	Bear Cove Reservoir	0.5	0.10	7.4	L1	L1
09/17/19	Highway 19 PRV	0.9	0.48	7.3	L1	L1
09/17/19	Pioneer Inn	0.8	0.22	7.3	L1	L1
09/03/19	Public Works Yard	0.3	0.12	7.6	L1	L1
09/10/19	Glen Lyon Restaurant	0.5	0.22	7.4	L1	L1
09/10/19	Airport Inn	0.5	0.58	7.4	L1	L1
09/10/19	Peel St Liftstation	0.6	0.61	7.5	L1	L1
09/17/19	B.C. Ferry	0.3	0.31	7.0	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
09/03/19	Tsulquate River (Untreated)		0.30	7.2		

**November**

Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
11/12/19	Hospital	0.7	0.19	7.4	<1	<1
11/19/19	Airport Washroom	0.7	0.21	7.4	<1	<1
11/12/19	Chatham Ave.	0.5	0.36	7.6	<1	<1
11/05/19	Bear Cove Reservoir	0.7	0.15	7.4	<1	<1
11/19/19	Highway 19 PRV	1.0	0.17	7.3	<1	<1
11/12/19	Pioneer Inn	0.8	0.17	7.3	<1	<1
11/05/19	Public Works Yard	0.6	0.13	7.7	<1	<1
11/19/19	Glen Lyon Restaurant	0.8	0.21	7.3	<1	<1
11/12/19	Airport Inn	0.8	0.39	7.4	<1	<1
11/05/19	Peel St Liftstation	0.9	0.19	7.4	<1	<1
11/19/19	B.C. Ferry	0.2	0.22	7.1	<1	<1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
11/05/19	Tsulquate River (Untreated)		0.35	6.9		

**August**

Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
08/06/19	Hospital	0.7	0.18	7.6	L1	L1
08/06/19	Airport Washroom	0.2	0.40	7.5	L1	L1
08/06/19	Chatham Ave.	0.3	0.28	7.7	L1	L1
08/13/19	Bear Cove Reservoir	0.6	0.18	7.4	L1	L1
08/20/19	Highway 19 PRV	0.9	0.26	7.1	L1	L1
08/06/19	Pioneer Inn	1.0	0.16	7.3	L1	L1
08/13/19	Public Works Yard	0.5	0.21	7.7	L1	L1
08/13/19	Glen Lyon Restaurant	0.8	0.27	7.3	L1	L1
08/20/19	Airport Inn	0.5	0.45	7.4	L1	L1
08/13/19	Peel St Liftstation	0.7	0.74	7.3	L1	L1
08/20/19	B.C. Ferry	0.4	0.29	7.3	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
08/20/19	Tsulquate River (Untreated)		0.28	7.1		

**October**

Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
10/01/19	Hospital	0.7	0.20	7.4	<1	<1
10/15/19	Airport Washroom	0.5	0.41	7.3	<1	<1
10/01/19	Chatham Ave.	0.2	0.28	7.7	<1	<1
10/08/19	Bear Cove Reservoir	0.6	0.21	7.4	<1	<1
10/08/19	Highway 19 PRV	0.9	0.24	7.4	<1	<1
10/01/19	Pioneer Inn	0.9	0.25	7.4	<1	<1
10/15/19	Public Works Yard	0.8	0.14	7.2	<1	<1
10/15/19	Glen Lyon Restaurant	0.8	0.11	7.2	<1	<1
10/01/19	Airport Inn	0.8	0.22	7.4	<1	<1
10/08/19	Peel St Liftstation	0.2	0.21	7.4	<1	<1
10/15/19	B.C. Ferry	0.4	0.11	7.3	<1	<1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
10/08/19	Tsulquate River (Untreated)		0.92	7.0		

**December**

Bacteriological Sampling						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
12/17/19	Hospital	0.7	0.25	7.3	<1	<1
12/17/19	Airport Washroom	0.5	0.42	7.4	<1	<1
12/03/19	Chatham Ave.	0.4	0.19	7.5	<1	<1
12/03/19	Bear Cove Reservoir	0.9	0.16	7.1	<1	<1
12/17/19	Highway 19 PRV	1.0	0.40	7.2	<1	<1
12/17/19	Pioneer Inn	1.1	0.22	7.1	<1	<1
12/03/19	Public Works Yard	1.0	0.17	7.1	<1	<1
12/17/19	Glen Lyon Restaurant	0.8	0.17	7.2	<1	<1
12/17/19	Airport Inn	0.5	0.21	7.3	<1	<1
12/17/19	Peel St Liftstation	0.6	0.18	7.1	<1	<1
12/17/19	B.C. Ferry	0.6	0.18	7.3	<1	<1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
12/03/19	Tsulquate River (Untreated)		1.48	6.6		

# RAW WATER BACTERIOLOGICAL SAMPLING RESULTS

Water Sample Range Report for DISTRICT OF PORT HARDY WATER PLANT

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## Water Sample Range Report

Island Health

**Facility Name:** DISTRICT OF PORT HARDY WATER PLANT  
**Facility Type:** 301-10000 (DWT)  
**Date Range:** Jan 1 2019 to Dec 9 2019  
**Date Created:** Dec 09 2019

Sampling Site	Date Collected	Total Coliform	E. Coli	Fecal Coliform
<u>Port Hardy,</u>				
<u>Tsulquate River Raw</u>				
<u>Water, Source site,</u>				
<u>Monthly</u>				
	22-Jan-2019	62.4	3.1	
	05-Feb-2019	56.3	1.0	
	05-Mar-2019	24.6	L1	
	09-Apr-2019	261.3	L1	
	21-May-2019	178.9	4.1	
	18-Jun-2019	410.6	8.6	
	23-Jul-2019	1046.2	17.5	
	20-Aug-2019	1986.3	15.8	
	03-Sep-2019	1986.3	5.2	
	08-Oct-2019	1299.7	15.8	
	05-Nov-2019	1119.9	L1	
	03-Dec-2019	<u>461.1</u>	<u>27.5</u>	
	Total Positive:	12	9	0

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

### Interpreting Sample Reports

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

- L1 Less than 1 (no detectable bacteria) - Meaning: No bacteria present
- OG Overgrown - Meaning: Too many background bacteria to give an accurate count
- EST Estimated Count
- and
- A Sample not tested; Too long in transit
- C Sample leaked/broken in transit
- D Sample not tested; No collection date given
- T Sample submitted unsatisfactory. Exceeded 30 hours holding time, please resample.
- NS No sample received with requisition

# TRIHALOMETHANE AND HALOACETIC ACID QUARTERLY RESULTS

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## Analytical Report

Bill To: District of Port Hardy  
 Box 68  
 Port Hardy, BC, Canada  
 V0N 2P0  
 Attn: Accounts Payable  
 Sampled By: Robert Cousins  
 Company: District of Port Hardy

Project ID:  
 Project Name:  
 Project Location:  
 LSD:  
 P.O.:  
 Proj. Acct. code:

Lot ID: **1327058**  
 Control Number:  
 Date Received: Jan 11, 2019  
 Date Reported: Jan 21, 2019  
 Report Number: 2370695

	Reference Number	1327058-1	1327058-2		
	Sample Date	Jan 10, 2019	Jan 10, 2019		
	Sample Time	NA	NA		
	Sample Location				
	Sample Description	DPH / Chatham Ave. / 11.1°C	DPH / Reservoir / 11.1°C		
	Matrix	Water	Water		
Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Trihalomethanes Screen - Water</b>					
Chloroform	mg/L	0.047	0.013		0.001
Bromodichloromethane	mg/L	0.003	<0.001		0.001
Dibromochloromethane	mg/L	<0.001	<0.001		0.001
Bromoform	mg/L	<0.001	<0.001		0.001
Total Trihalomethanes	mg/L	0.050	0.013		0.001
<b>Trihalomethanes - Surrogate Recovery</b>					
Dibromofluoromethane	EPA Surrogate %	103	99		50-140
Toluene-d8	EPA Surrogate %	107	95		50-140
Bromofluorobenzene	EPA Surrogate %	103	115		50-140
<b>Haloacetic Acids - Water</b>					
Monochloroacetic Acid	µg/L	<2.0	<2.0		2.0
Monobromoacetic Acid	µg/L	<2.0	<2.0		2.0
Dichloroacetic Acid	µg/L	13.8	2.9		2.0
Bromochloroacetic Acid	µg/L	<2.0	<2.0		2.0
Dibromoacetic Acid	µg/L	<2.0	<2.0		2.0
Trichloroacetic Acid	µg/L	12.6	2.4		2.0
Total Haloacetic Acids (HAA6)	µg/L	26.4	5.3		2.0

  
 Approved by:  
 Mathieu Simoneau  
 Operations Manager

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Terms and Conditions: <http://www.element.com/terms/terms-and-conditions>



Analytical Report

Bill To: District of Port Hardy  
 Box 88  
 Port Hardy, BC, Canada  
 V0N 2P0  
 Attn: Accounts Payable  
 Sampled By: R. LeFort  
 Company: District of Port Hardy

Project ID:  
 Project Name:  
 Project Location:  
 LSD:  
 P.O.:  
 Proj. Acct. code:

Lot ID: **1342336**  
 Control Number:  
 Date Received: Apr 3, 2019  
 Date Reported: Apr 11, 2019  
 Report Number: 2392723

Reference Number	1342336-1	1342336-2			
Sample Date	Apr 02, 2019	Apr 02, 2019			
Sample Time	09:05	10:37			
Sample Location					
Sample Description	WTP Reservoir / 6.4 °C	Chatham Ave. / 6.4 °C			
Matrix	Water	Water			
Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Trihalomethanes Screen - Water</b>					
Chloroform	mg/L	0.003	0.049		0.001
Bromodichloromethane	mg/L	<0.001	0.002		0.001
Dibromochloromethane	mg/L	<0.001	<0.001		0.001
Bromoform	mg/L	<0.001	<0.001		0.001
Total Trihalomethanes	mg/L	0.003	0.051		0.001
<b>Trihalomethanes - Surrogate Recovery</b>					
Dibromofluoromethane	EPA Surrogate %	109	108		50-140
Toluene-d8	EPA Surrogate %	99	98		50-140
Bromofluorobenzene	EPA Surrogate %	97	103		50-140
<b>Haloacetic Acids - Water</b>					
Monochloroacetic Acid	µg/L	<2.0	<2.0		2.0
Monobromoacetic Acid	µg/L	<2.0	<2.0		2.0
Dichloroacetic Acid	µg/L	5.8	13.9		2.0
Bromochloroacetic Acid	µg/L	<2.0	<2.0		2.0
Dibromoacetic Acid	µg/L	<2.0	<2.0		2.0
Trichloroacetic Acid	µg/L	7.9	21.8		2.0
Total Haloacetic Acids (HAA6)	µg/L	13.7	35.7		2.0

Approved by:   
 Mathieu Simoneau  
 Operations Manager

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Analytical Report

Bill To: District of Port Hardy  
Box 68  
Port Hardy, BC, Canada  
V0N 2P0  
Attn: Accounts Payable  
Sampled By: R. LeFort  
Company: District of Port Hardy

Project ID:  
Project Name:  
Project Location:  
LSD:  
P.O.:  
Proj. Acct. code:

Lot ID: **1363165**  
Control Number:  
Date Received: Jul 11, 2019  
Date Reported: Jul 22, 2019  
Report Number: 2422902

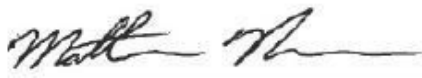
	Reference Number	1363165-1	1363165-2		
	Sample Date	Jul 10, 2019	Jul 10, 2019		
	Sample Time	10:30	11:15		
	Sample Location				
	Sample Description	WTP Reservoir / 7.9 °C	Chatham Ave. / 7.9 °C		
	Matrix	Water	Water		
Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Trihalomethanes Screen - Water</b>					
Chloroform	mg/L	0.025	0.058		0.001
Bromodichloromethane	mg/L	0.002	0.004		0.001
Dibromochloromethane	mg/L	<0.001	<0.001		0.001
Bromoform	mg/L	<0.001	<0.001		0.001
Total Trihalomethanes	mg/L	0.027	0.062		0.001
<b>Trihalomethanes - Surrogate Recovery</b>					
Dibromofluoromethane	EPA Surrogate %	119	116		50-140
Toluene-d8	EPA Surrogate %	100	101		50-140
Bromofluorobenzene	EPA Surrogate %	98	97		50-140
<b>Haloacetic Acids - Water</b>					
Monochloroacetic Acid	µg/L	<2.0	<2.0		2.0
Monobromoacetic Acid	µg/L	<2.0	<2.0		2.0
Dichloroacetic Acid	µg/L	7.9	16.0		2.0
Bromochloroacetic Acid	µg/L	<2.0	<2.0		2.0
Dibromoacetic Acid	µg/L	<2.0	<2.0		2.0
Trichloroacetic Acid	µg/L	10.6	23.8		2.0
Total Haloacetic Acids (HAA6)	µg/L	18.5	39.8		2.0

### Analytical Report

Bill To: District of Port Hardy Box 68 Port Hardy, BC, Canada V0N 2P0	Project ID: Project Name: Project Location: LSD: P.O.: 4082 Proj. Acct. code:	Lot ID: <b>1381198</b> Control Number: Date Received: Oct 3, 2019 Date Reported: Oct 11, 2019 Report Number: 2447728
Attn: Accounts Payable Sampled By: R. LeFort Company: District of Port Hardy		

Reference Number	1381198-2
Sample Date	October 02, 2019
Sample Time	11:30
Sample Location	
Sample Description	Chatham Ave. / 4 °C
Sample Matrix	Water

Analyte	Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
<b>Trihalomethanes Screen - Water</b>					
Chloroform	mg/L	0.082	0.001		
Bromodichloromethane	mg/L	0.004	0.001		
Dibromochloromethane	mg/L	<0.001	0.001		
Bromoform	mg/L	<0.001	0.001		
Total Trihalomethanes	mg/L	0.088	0.001	0.1	Below MAC
<b>Trihalomethanes - Surrogate Recovery</b>					
Dibromofluoromethane	EPA Surrogate %	110	50-140		
Toluene-d8	EPA Surrogate %	98	50-140		
Bromofluorobenzene	EPA Surrogate %	100	50-140		
<b>Haloacetic Acids - Water</b>					
Monochloroacetic Acid	µg/L	<2.0	2.0		
Monobromoacetic Acid	µg/L	<2.0	2.0		
Dichloroacetic Acid	µg/L	8.7	2.0		
Bromochloroacetic Acid	µg/L	<2.0	2.0		
Dibromoacetic Acid	µg/L	<2.0	2.0		
Trichloroacetic Acid	µg/L	40.2	2.0		
Total Haloacetic Acids (HAA6)	µg/L	48.9	2.0		

Approved by:   
Matthew Norman, BSc, PChem  
Operations Chemist

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**Analytical Report**

Bill To: District of Port Hardy Box 68 Port Hardy, BC, Canada V0N 2P0	Project ID: Project Name: Project Location: LSD: P.O.: 4092 Proj. Acct. code:	Lot ID: <b>1381198</b> Control Number: Date Received: Oct 3, 2019 Date Reported: Oct 11, 2019 Report Number: 2447728
Attn: Accounts Payable Sampled By: R. LeFort Company: District of Port Hardy		

Analyte	Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
<b>Trihalomethanes Screen - Water</b>					
Chloroform	mg/L	0.037	0.001		
Bromodichloromethane	mg/L	0.002	0.001		
Dibromochloromethane	mg/L	<0.001	0.001		
Bromoform	mg/L	<0.001	0.001		
Total Trihalomethanes	mg/L	0.039	0.001	0.1	Below MAC
<b>Trihalomethanes - Surrogate Recovery</b>					
Dibromofluoromethane	EPA Surrogate %	106	50-140		
Toluene-d8	EPA Surrogate %	100	50-140		
Bromofluorobenzene	EPA Surrogate %	105	50-140		
<b>Haloacetic Acids - Water</b>					
Monochloroacetic Acid	µg/L	<2.0	2.0		
Monobromoacetic Acid	µg/L	<2.0	2.0		
Dichloroacetic Acid	µg/L	12.4	2.0		
Bromochloroacetic Acid	µg/L	<2.0	2.0		
Dibromoacetic Acid	µg/L	<2.0	2.0		
Trichloroacetic Acid	µg/L	17.9	2.0		
Total Haloacetic Acids (HAA6)	µg/L	30.3	2.0		

## ADDITIONAL SAMPLING RESULTS

Sampling Results before bringing Fort Rupert Reservoir and Storey's Beach PRV online



Success Through Science®

Maxxam Job #: B901539  
Report Date: 2019/01/10

DISTRICT OF PORT HARDY  
Your P.O. #: 1936

### MICROBIOLOGY (DRINKING WATER)

Maxxam ID			VB1795	VB1796	
Sampling Date			2019/01/07	2019/01/07	
COC Number			g034087	g034087	
	UNITS	MAC	STORIES BEACH PRV	FR RESERVOIR	QC Batch
Microbiological Param.					
Total Coliforms	CFU/100mL	0	0	0	9286751
E. coli	CFU/100mL	0	0	0	9286751
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				



Success Through Science®


Maxxam Job #: B903636  
Report Date: 2019/01/18


DISTRICT OF PORT HARDY  
Your P.O. #: 1936

### MICROBIOLOGY (DRINKING WATER)

Maxxam ID			VC2229	
Sampling Date			2019/01/15 11:00	
COC Number			129524	
	UNITS	MAC	FR RESERVOIR	QC Batch
Microbiological Param.				
Total Coliforms	CFU/100mL	0	0	9297155
E. coli	CFU/100mL	0	0	9297155
No Fill	No Exceedance			
Grey	Exceeds 1 criteria policy/level			
Black	Exceeds both criteria/levels			

## Storey's Beach Sampling

<b>STOREY'S BEACH</b> 	Port Hardy – Salt Water	
	Carlton Street	
	Rotary Pavilion	Bacteriological Sample on 28/05/2019 – E. Coli : L5
	Scotia Street	Bacteriological Sample on 28/05/2019 – E. Coli : L5
	100 m NW of Rotary Pavilion	Bacteriological Sample on 28/05/2019 – E. Coli : L5
		Bacteriological Sample on 28/05/2019 – E. Coli : L5
	100 m SE of Rotary Pavilion	

<b>STOREY'S BEACH</b> 	Port Hardy – Salt Water	
	Carlton Street	Bacteriological Sample on 28/05/2019 – Enterococci : L5
	Rotary Pavilion	Bacteriological Sample on 28/05/2019 - Enterococci: L5
	Scotia Street	Bacteriological Sample on 28/05/2019 – Enterococci: L5
	100 m NW of Rotary Pavilion	Bacteriological Sample on 28/05/2019 – Enterococci: L5
	100 m SE of Rotary Pavilion	Bacteriological Sample on 25/06/2019 – Enterococci: L5
		Bacteriological Sample on 25/06/2019 – Enterococci: L5
Bacteriological Sample on 28/05/2019 – Enterococci: L5		

Last updated Thursday, July 04, 2019

Source Surface Water Sampling of Tsulquate River



Maxxam Job #: B934790  
Report Date: 2019/05/16

DISTRICT OF PORT HARDY  
Site Location: PORT HARDY WTP  
Your P.O. #: 1936  
Sampler Initials: RL

**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

Maxxam ID	VQ6341			
Sampling Date	2019/05/08 11:30			
COC Number	007221			
	UNITS	RIVER RAW	RDL	QC Batch
<b>Total Metals by ICPMS</b>				
Total Aluminum (Al)	ug/L	104	3.0	9415590
Total Antimony (Sb)	ug/L	<0.50	0.50	9415590
Total Arsenic (As)	ug/L	<0.10	0.10	9415590
Total Barium (Ba)	ug/L	<1.0	1.0	9415590
Total Beryllium (Be)	ug/L	<0.10	0.10	9415590
Total Bismuth (Bi)	ug/L	<1.0	1.0	9415590
Total Boron (B)	ug/L	<50	50	9415590
Total Cadmium (Cd)	ug/L	0.025	0.010	9415590
Total Chromium (Cr)	ug/L	<1.0	1.0	9415590
Total Cobalt (Co)	ug/L	<0.20	0.20	9415590
Total Copper (Cu)	ug/L	5.76	0.50	9415590
Total Iron (Fe)	ug/L	91	10	9415590
Total Lead (Pb)	ug/L	4.47	0.20	9415590
Total Manganese (Mn)	ug/L	3.7	1.0	9415590
Total Molybdenum (Mo)	ug/L	<1.0	1.0	9415590
Total Nickel (Ni)	ug/L	<1.0	1.0	9415590
Total Selenium (Se)	ug/L	<0.10	0.10	9415590
Total Silicon (Si)	ug/L	1330	100	9415590
Total Silver (Ag)	ug/L	<0.020	0.020	9415590
Total Strontium (Sr)	ug/L	5.3	1.0	9415590
Total Thallium (Tl)	ug/L	<0.010	0.010	9415590
Total Tin (Sn)	ug/L	<5.0	5.0	9415590
Total Titanium (Ti)	ug/L	<5.0	5.0	9415590
Total Uranium (U)	ug/L	<0.10	0.10	9415590
Total Vanadium (V)	ug/L	<5.0	5.0	9415590
Total Zinc (Zn)	ug/L	17.0	5.0	9415590
Total Zirconium (Zr)	ug/L	<0.10	0.10	9415590
RDL = Reportable Detection Limit				

**VIHA PKG, SURFACE WATER - VICTORIA (WATER)**

Maxxam ID		VQ6341		
Sampling Date		2019/05/08 11:30		
COC Number		007221		
	UNITS	RIVER RAW	RDL	QC Batch
<b>Misc. Inorganics</b>				
UV absorbance (254nm)	AU/cm	0.184	0.010	9413181
<b>ANIONS</b>				
Nitrite (N)	mg/L	<0.0050	0.0050	9414401
<b>Calculated Parameters</b>				
Total Hardness (CaCO <sub>3</sub> )	mg/L	7.13	0.50	9410360
Nitrate (N)	mg/L	0.030	0.020	9410721
Total Organic Nitrogen (N)	mg/L	<0.020	0.020	9411412
Transmittance at 254nm	%T/cm	65.4	N/A	9411482
<b>Misc. Inorganics</b>				
Fluoride (F)	mg/L	<0.020	0.020	9414113
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	5.5	1.0	9415138
Total Organic Carbon (C)	mg/L	3.5	0.50	9416897
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<1.0	1.0	9415138
Bicarbonate (HCO <sub>3</sub> )	mg/L	6.7	1.0	9415138
Carbonate (CO <sub>3</sub> )	mg/L	<1.0	1.0	9415138
Hydroxide (OH)	mg/L	<1.0	1.0	9415138
<b>Anions</b>				
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	<1.0	1.0	9415632
Dissolved Chloride (Cl)	mg/L	2.2	1.0	9413813
<b>MISCELLANEOUS</b>				
True Colour	Col. Unit	37	5	9411522
Tannins and Lignins	mg/L	0.77	0.10	9414903
<b>Nutrients</b>				
Total Ammonia (N)	mg/L	0.076	0.015	9414715
Nitrate plus Nitrite (N)	mg/L	0.030	0.020	9414400
Total Nitrogen (N)	mg/L	0.093	0.020	9416974
<b>Physical Properties</b>				
Conductivity	uS/cm	23.5	2.0	9415139
pH	pH	6.93		9415129
<b>Physical Properties</b>				
Total Dissolved Solids	mg/L	25	10	9411342
RDL = Reportable Detection Limit N/A = Not Applicable				



Maxxam Job #: B934790  
 Report Date: 2019/05/16

DISTRICT OF PORT HARDY  
 Site Location: PORT HARDY WTP  
 Your P.O. #: 1936  
 Sampler Initials: RL

**VIHA PKG, SURFACE WATER - VICTORIA (WATER)**

Maxxam ID		VQ6341		
Sampling Date		2019/05/08 11:30		
COC Number		007221		
	UNITS	RIVER RAW	RDL	QC Batch
Turbidity	NTU	0.38	0.10	9413269
<b>Elements</b>				
Total Mercury (Hg)	ug/L	<0.0020	0.0020	9416334
<b>Total Metals by ICPMS</b>				
Total Calcium (Ca)	mg/L	2.01	0.050	9410715
Total Magnesium (Mg)	mg/L	0.512	0.050	9410715
Total Potassium (K)	mg/L	0.065	0.050	9410715
Total Sodium (Na)	mg/L	1.63	0.050	9410715
<b>Microbiological Param.</b>				
Heterotrophic Plate Count	CFU/mL	23	1	9415190
Total Coliforms	CFU/100mL	90	N/A	9415136
E. coli	CFU/100mL	1.0	N/A	9415136
<b>Calculated Parameters</b>				
Langelier Index (@ 4.4C)	N/A	-3.86	N/A	9411435
Langelier Index (@ 60C)	N/A	-2.82	N/A	9411442
Saturation pH (@ 4.4C)	N/A	10.8	N/A	9411435
Saturation pH (@ 60C)	N/A	9.75	N/A	9411442
RDL = Reportable Detection Limit N/A = Not Applicable				



Sample Results after Reservoir #1 Tee and Check Valve Installation and Cathodic Protection Installation



BV Labs Job #: B959041  
Report Date: 2019/07/22

DISTRICT OF PORT HARDY  
Your P.O. #: 1936

**MICROBIOLOGY (DRINKING WATER)**

BV Labs ID			WD3489	
Sampling Date			2019/07/19 10:00	
COC Number			G129563	
	UNITS	MAC	RESERVOIR #1	QC Batch
<b>Microbiological Param.</b>				
Total Coliforms (QT)	MPN/100mL	0	0	9516179
E. coli (QT)	MPN/100mL	0	0	9516179
No Fill	No Exceedance			
Grey	Exceeds 1 criteria policy/level			
Black	Exceeds both criteria/levels			



BV Labs Job #: B958770  
Report Date: 2019/07/22

DISTRICT OF PORT HARDY  
Your P.O. #: 1936

**MICROBIOLOGY (DRINKING WATER)**

BV Labs ID			WD1911	
Sampling Date			2019/07/18 12:10	
COC Number			G129562	
	UNITS	MAC	RESERVOIR #1	QC Batch
<b>Microbiological Param.</b>				
Total Coliforms	CFU/100mL	0	0	9517266
E. coli	CFU/100mL	0	0	9517266
No Fill	No Exceedance			
Grey	Exceeds 1 criteria policy/level			
Black	Exceeds both criteria/levels			