

Maple Ridge Parks, Recreation & Culture

WATER QUALITY REPORT 2019

Thornhill Hall Water System

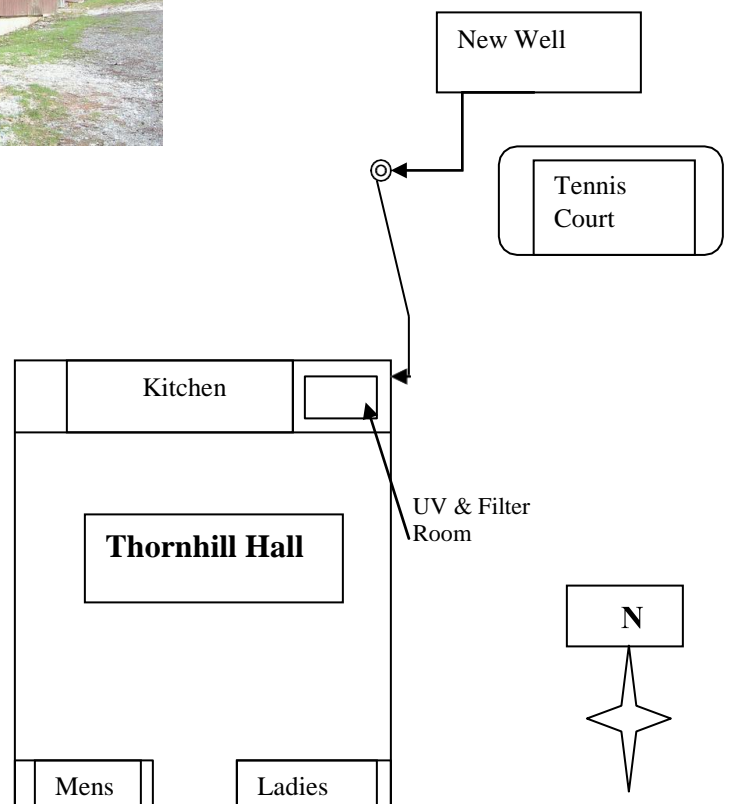


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Prepared by:

Andrew McAusland
Facilities Maintenance Supervisor
City of Maple Ridge

INTRODUCTION

Maple Ridge Parks, Recreation & Culture, Facilities Department, provides well water under permit by the Fraser Health Authority (FHA). As required by Section 15 of the British Columbia Drinking Water Protection Act, this document is the Maple Ridge Parks, Recreation & Culture, Facilities Department annual report on the Small Drinking Water systems that the City operates on behalf of users at Thornhill Hall - 26000 block on 98th Avenue, Maple Ridge.

OUTLINE

Well identification number - 33339
GPS location of well head - N 49.18099° W -122.50123° accuracy 23'

The Thornhill Hall well was drilled by A & H Drilling Ltd on August 30th – September 1st, 2011 and is a 455' well and provides fresh water for the hall. The well head is located a distance of approximately 35 meters uphill from the facility and is fed to the building by a pump and controller. The well head is sealed with padlocks.

Equipment

- Trojan UV max model Pro 7 disinfection system including thermal relief
- 1 inch Thermal Expansion valve
- 5 micron - 20 inch x 4 ½ inch American Filter unit

FACILITY MAINTENANCE

This well is maintained by the Maple Ridge Parks, Recreation & Culture, Facilities Department. A qualified Small Water System Operators provides security, monitoring, maintenance, upgrades and emergency response to all of our Parks and Facilities small water systems.

ROUTINE WATER SAMPLING

Water samples are taken from each location every Tuesday morning by the Operations Department and a courier delivers these samples on the same day, to the Metro Vancouver laboratory in Burnaby. The Metro Vancouver lab sends the results to the City of Maple Ridge and the Fraser Health Authority by e-mail. The results are reported weekly unless an indicator is found in the sample. In this event, a communication from the Metro Vancouver lab is issued on the Wednesday (Thursday latest) to the City of Maple Ridge.

It is important to note that this monitoring program provides a representative picture of drinking water quality in the well system to the tap only.

ADVISORIES

In the event of a concern discovered upon analysis, the Metro Vancouver Water Department lab will email until the report has been received by the City of Maple Ridge. The communications should follow the following list until a response has been assured:

- | | | |
|---------------------|-------------------|---------------------|
| 1. Michael Albrecht | 604 363 6671 cell | |
| 2. Andrew McAusland | 604 788 6543 cell | 604-467-7476 office |
| 3. Michael Millward | 604-619-8314 cell | 604-467-7385 office |
| 4. David Boag | 604-619-8315 cell | 604-467-7344 office |

Fraser Health Authority contact info:

Binny Sivia - Public Health Officer	604-870-7902
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If required, the well is shut down immediately and a notice will be posted advising the users that the water is not potable until further notice.

EMERGENCY MEASURES

Response instructions

- Keys, devices and signs are taken to the location described in the alarm advisory and the water valve is physically shut off and locked out.
- Signs are posted at all entrance doors, informing the public of the water shut-off.
- The date of the notice and the responding staff's initial should be written on each posting.
- The area Caretaker must be informed immediately while the above procedure is being implemented.

Contacts:

- Thornhill Hall Association 604 462 7869
- The Booking Clerk and Caretakers are responsible for informing the user groups who may have been exposed to the drinking water conditions since the last favorable analysis
- Binny Sivia (Public Health Inspector) is to be notified at 604-870-7902 within one business day.
- Inform Michael Millward (604-467-7385), and David Boag (604-467-7344) when the above steps have been completed.
- City Water Works (604-467-7393) must be contacted to arrange an immediate sample taken for re-test.

All inquiries from the media and public must be referred to the Parks and Facilities Director (604-467-7344).

Bacteriological Monitoring

Weekly samples are analyzed for fecal coliform, total coliform and heterotrophic plate count (HPC) and response is made according to provincial guidelines.

Table 1. BC Drinking Water Protection Regulation Microbiological Standards

Parameter	Occurrence	Standard
Fecal Coliform	1 sample	Less than 1 fecal coliform per 100mL
E.coli	a) 1 sample in a 30 day period	0 E.coli m per 100mL
	b) more than 1 sample in a 30 day period.	At least 90% of samples have 0 E.coli per 100mL and no sample has more than 10 E.coli per 100mL

Arsenic in Drinking Water

Arsenic is found naturally in the rocks in the earth's crust. It can be found in some drinking water supplies, and wells. Drinking water containing arsenic can have serious short-term and long-term health effects.

How does arsenic get into drinking water?

Arsenic can get into drinking water from natural deposits or runoff from agriculture, mining and industrial processes.

In B.C., natural minerals are the most common sources of arsenic in drinking water.

The amount of arsenic in ground water supplies like wells is usually higher than in surface water supplies such as lakes, streams and rivers.

What are the health effects of arsenic exposure?

Short to medium term (days to weeks) exposure to very high levels of arsenic in drinking water can lead to arsenic poisoning.

Symptoms of exposure to high levels of arsenic include stomach pain, vomiting, diarrhea, and impaired nerve function, which may result in 'pins and needles' sensation or numbness and burning in hands and feet.

Arsenic can also cause skin changes, which include darkening, and wart-like or corn-like growths. These are mostly found on the palms of the hands or bottoms of the feet. Other symptoms can include skin flushing and rashes.

As children tend to drink more water per unit of body weight than adults, they may have more exposure to arsenic in drinking water. As a result children may be at greater risk of illness when higher levels of arsenic are present.

Long-term (years to decades) exposure to even relatively low amounts of arsenic in drinking water can increase your risk of developing certain cancers, including:

- skin,
- lung,
- kidney,
- bladder, and
- liver.

The risk of cancer is the reason for developing the Canadian guideline for arsenic in drinking water. For more information on The Guidelines for Canadian Drinking Water Quality see, www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-arsenic.html.

What amount of arsenic causes health effects?

Health Canada set a Maximum Acceptable Concentration (MAC) of 10 micrograms per litre for arsenic in drinking water. This can also be reported as 10 µg/L, or as 0.010 milligrams per litre (mg/L).

This level was set based on the ability to treat water practicably to this level. This amount is still linked with a health risk higher than the level considered to be a very minor risk. For this reason people should consider taking precautions with their drinking water even if the arsenic levels are slightly below the guideline. Data collected in Canada indicates that the levels of arsenic in drinking water is usually less than 0.005 mg/L, but concentrations may be higher in some areas.

How do I know if there is arsenic in my drinking water?

Public drinking water systems are monitored regularly. In drinking water, arsenic has no odor or taste and can only be detected by a chemical test.

Most private wells are not tested routinely for water quality or contaminants. It is the well owner's responsibility to test the water for arsenic. Any well may contain arsenic or other contaminants. Private wells should be tested regularly for water quality.

Contact your local public health unit or environmental health officer for information on the testing process in British Columbia.

For more information about private well water testing, see [HealthLinkBC File #05b Should I Get My Well Water Tested?](#)

What can I do if there is arsenic in my drinking water?

Water with arsenic is only a concern if it is being used for drinking or preparing food.

Exposure through breathing and skin contact is not harmful. For example, there are no known health effects from hand washing, bathing or washing clothing in water with arsenic.

If an initial test detects arsenic, even at levels below the guideline, it is important to have a second test done to confirm the results. If your water tests positive for arsenic above the recommended level, you should use another source for drinking water or treat the current source.

There are several treatment devices and options including reverse osmosis filters and distillation. Chlorination and mechanical filters do not remove arsenic from water. Boiling water may increase the concentration of arsenic.

There is no regulatory control over treatment devices for private homes, therefore the well owner must be careful and select an appropriate treatment device that has been certified for the removal of arsenic.

When purchasing a treatment device, you should consider one that has been certified by an organization accredited by the Standards Council of Canada (SCC). The treatment device should meet the following standards:

- NSF/ANSI Standard 62 on drinking water distillation and adsorption systems; or
- Standard 58 on reverse osmosis drinking water treatment systems; or
- Standards 53 on drinking water treatment units – with specific designation for the water quality parameters you are trying to remove (arsenic).

Certification assures that a device works as the manufacturer or distributor claims. Find an up-to-date list of accredited organizations by visiting Standards Council of Canada at www.scc.ca/en/accreditation/product-process-and-service-certification/directory-of-accredited-clients.

For more information on drinking water and treatment options, contact your local environmental health officer.

For More Information

For more information about arsenic and drinking water, visit:

- B.C. Ministry of Environment - Arsenic in Groundwater
www2.gov.bc.ca/assets/gov/environment/air-land-water/water/water-wells/as020715_fin3.pdf
- Health Canada – Arsenic in Drinking Water
www.canada.ca/en/health-canada/services/healthy-living/your-health/environment/arsenic-drinking-water.html

For more HealthLinkBC File topics, visit www.HealthLinkBC.ca/healthfiles or your local public health unit. For non-emergency health information and advice in B.C. visit www.HealthLinkBC.ca or call 8-1-1 (toll-free). For deaf and hearing-impaired assistance, call 7-1-1. Translation services are available in more than 130 languages on request.

Sample Range Report

Fraser Health Authority

Facility Name: Thornhill Hall Water System

Date Range: Jan 1 2019 to Dec 31 2019

Operator

Sampling Site	Date Collected	Total Coliform	E. Coli	Fecal Coliform
<u>Audit - Outside hose</u>				
<u>bib_26007 98th Ave</u>				
	2-6-2019	L1	L1	
	3-20-2019	L1	L1	
	4-30-2019	L1	L1	
	6-3-2019	L1	L1	
	7-29-2019	L1	L1	
	9-23-2019	<u>L1</u>	<u>L1</u>	
	Total Positive:	0	0	0

Result Values:	E - estimated	L - less than	G - greater than
Samples that contain total coliform:	0		0.00% of total
Samples that contain e. coli:	0		0.00% of total
Samples that contain fecal coliform:	0		0.00% of total
Number of consecutive samples that contain total coliform:	0		
Number of samples that contain total coliform in last 30 days:	0/0		
Total number of samples:	6		

Comments:

Environmental Health Officer

Feb 12 2020

FOR FURTHER INFORMATION PLEASE CALL: Binny Sivia

Metro Vancouver Analysis Report Thornhill Hall

Sample Name	Sample Description	Sample Date	Sample Type	Chlorine Free	Ecoli	Ecoli	HPC	Temperature	Total Coliform	Total Coliform	Turbidity
MPR-WP5	Thornhill Hall	1/3/2019 11:40				<1	60	10		<1	0.15
MPR-WP5	Thornhill Hall	1/8/2019 11:49				<1	20	10		<1	0.11
MPR-WP5	Thornhill Hall	1/15/2019 10:40	GRAB			<1	38	10		<1	0.12
MPR-WP5	Thornhill Hall	1/22/2019 8:33				<1	LA	9		<1	0.11
MPR-WP5	Thornhill Hall	1/29/2019 10:55				<1	16	9		<1	0.17
MPR-WP5	Thornhill Hall	2/5/2019 10:55				<1	14	10		<1	0.15
MPR-WP5	Thornhill Hall	2/12/2019 10:20				<1	LA	9		<1	0.15
MPR-WP5	Thornhill Hall	2/19/2019 10:10				<1	34	10		<1	0.12
MPR-WP5	Thornhill Hall	2/26/2019 10:10				<1	52	10		<1	0.12
MPR-WP5	Thornhill Hall	3/5/2019 10:00				<1	22	8		<1	0.16
MPR-WP5	Thornhill Hall	3/12/2019 11:06				<1	12	10		<1	0.90
MPR-WP5	Thornhill Hall	3/19/2019 10:15				<1	16	10		<1	0.13
MPR-WP5	Thornhill Hall	3/26/2019 10:46				<1	30	10		<1	0.30
MPR-WP5	Thornhill Hall	4/2/2019 10:00				<1	34	11		<1	0.12
MPR-WP5	Thornhill Hall	4/9/2019 10:05				<1	20	11		<1	0.17
MPR-WP5	Thornhill Hall	4/16/2019 10:10				<1	8	11		<1	0.14
MPR-WP5	Thornhill Hall	4/23/2019 10:14				<1	34	10		<1	0.13
MPR-WP5	Thornhill Hall	4/30/2019 10:36				<1	4	11		<1	0.13
MPR-WP5	Thornhill Hall	5/7/2019 10:19				<1	2	12		<1	0.14
MPR-WP5	Thornhill Hall	5/14/2019 10:00				<1	12	12		<1	0.35
MPR-WP5	Thornhill Hall	5/21/2019 10:06				<1	6	12		<1	0.12
MPR-WP5	Thornhill Hall	5/28/2019 10:58				<1	12	12		<1	0.21
MPR-WP5	Thornhill Hall	6/4/2019 10:22				<1	30	12		<1	0.18
MPR-WP5	Thornhill Hall	6/11/2019 11:20				<1	10	12		<1	0.13
MPR-WP5	Thornhill Hall	6/18/2019 10:25				<1	10	13		<1	0.45
MPR-WP5	Thornhill Hall	6/25/2019 10:25				<1	18	13		<1	0.15
MPR-WP5	Thornhill Hall	7/2/2019 10:20				<1	24	13		<1	0.11
MPR-WP5	Thornhill Hall	7/9/2019 10:15				<1	50	13		<1	0.16
MPR-WP5	Thornhill Hall	7/16/2019 10:15				<1	20	13		<1	0.33
MPR-WP5	Thornhill Hall	7/23/2019 11:02				<1	84	11		<1	0.21
MPR-WP5	Thornhill Hall	7/30/2019 10:30				<1	14	11		<1	0.11
MPR-WP5	Thornhill Hall	8/6/2019 10:17				<1	82	13		<1	0.22
MPR-WP5	Thornhill Hall	8/13/2019 10:05				<1	56	13		<1	0.14
MPR-WP5	Thornhill Hall	8/20/2019 12:09				<1	46	11		<1	0.23
MPR-WP5	Thornhill Hall	8/27/2019 10:15				<1	44	11		<1	0.18
MPR-WP5	Thornhill Hall	9/3/2019 10:35				<1	30	11		<1	0.22
MPR-WP5	Thornhill Hall	9/10/2019 10:15				<1	28	13		<1	0.18
MPR-WP5	Thornhill Hall	9/17/2019 10:25				<1	20	15		<1	0.12
MPR-WP5	Thornhill Hall	9/24/2019 10:53				<1	40	12		<1	0.09
MPR-WP5	Thornhill Hall	10/1/2019 10:17				<1	28	11		<1	0.20
MPR-WP5	Thornhill Hall	10/8/2019 11:05				<1	12	11		<1	0.13
MPR-WP5	Thornhill Hall	10/15/2019 10:20	GRAB			<1	18	12		<1	0.14
MPR-WP5	Thornhill Hall	10/22/2019 13:40	GRAB			<1	110	13		<1	0.2
MPR-WP5	Thornhill Hall	10/29/2019 10:25	GRAB			<1	48	10		<1	0.11
MPR-WP5	Thornhill Hall	11/5/2019 11:30	GRAB			<1	190	11		<1	0.27
MPR-WP5	Thornhill Hall	11/12/2019 10:30	GRAB			<1	52	12		<1	0.12
MPR-WP5	Thornhill Hall	11/19/2019 11:01	GRAB			<1	28	13		<1	0.12
MPR-WP5	Thornhill Hall	11/26/2019 10:44	GRAB			<1	24	12		<1	0.12
MPR-WP5	Thornhill Hall	12/3/2019 11:05	GRAB			<1	28	13		<1	0.11
MPR-WP5	Thornhill Hall	12/10/2019 10:25	GRAB			<1	36	12		<1	0.12
MPR-WP5	Thornhill Hall	12/17/2019 10:46	GRAB			<1	10	10		<1	0.19
MPR-WP5	Thornhill Hall	12/23/2019 10:50	GRAB			<1	NA	12		<1	0.15
MPR-WP5	Thornhill Hall	12/30/2019 10:20	GRAB			<1	NA	13		<1	0.19

DRINKING WATER SYSTEM ANNUAL REPORT

Reporting Period: January 1st to December 31st, 2019 (year)

Water System: Thornhill Hall Well

Water System Owner: City of Maple Ridge

Primary Contact Name (Operator or Manager): Michael Albrecht

Phone Number (Operator or Manager): 604-363-6671

E-mail (Operator or Manager): malbrecht@mapleridge.ca

DESCRIBE YOUR WATER SUPPLY SYSTEM

What is the Source(s) of Raw Water?

- Deep Well Shallow Well Surface Water Other

If other, specify details: _____

Does the Drinking Water System have Primary Disinfection? Yes No

- Chlorination Ultraviolet Light Ozone Other

If other, specify details: _____

Does the Drinking Water System have Secondary Disinfection? Yes No

- Chlorination Other

If other, specify details: _____

Does the Drinking Water System have Filtration? Yes No

Check all boxes that apply

- Cartridge Filter(s) Carbon Filter Sand Filtration Reverse Osmosis Other

If other, specify details: _____

PUBLIC REPORTING

Emergency Response & Contingency Plan (ERCP)

Is your ERCP up to Date? Yes No

How do you Inform the System Users of the ERCP?

- Hand Delivered Bulletin Board Newspaper Utility Bill Insert Website

Other (specify details) _____

Drinking Water System Annual Report

How do you Inform the System Users of the Annual Report?

- Hand Delivered Bulletin Board Newspaper Utility Bill Insert Website

Other (specify details) _____

COMPLIANCE WITH OPERATING PERMIT

List the conditions that have been placed on your Operating Permit (if you have conditions, these will be stated on your permit):

No Decal Required

Are you in compliance with the conditions listed on your Operating Permit? Yes No N/A

BACTERIOLOGICAL TESTING AND DRINKING WATER PROTECTION REGULATION WATER QUALITY STANDARDS

How many bacteriological samples were collected during this reporting period? 52

What is the minimum required sampling frequency for this system? (#samples/month) 4

Additional sampling details: _____

Was the minimum required sampling frequency achieved? Yes No

Comments: _____

Bacteriological summary attached to this report? Yes No

If no, how do the users of the system view the results?

WATER QUALITY STANDARDS FOR POTABLE WATER

Parameter:	Standard:	Did this system meet standard?	
Escherichia coli (for all samples)	No detectable Escherichia coli per 100ml	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Total Coliform Bacteria (if only 1 sample collected in a 30 day period)	No detectable total coliform bacteria per 100ml	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Total Coliform Bacteria (if more than 1 sample collected in a 30 day period)	No more than 10% of samples contain total coliform bacteria, and No sample has more than 10 total coliform bacteria per 100ml	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

If the system did not meet any of above Drinking Water Protection Regulation standards, record the results in the table below; attach additional sheets if necessary.

Date	TC/100ml	E.coli/100ml	Reason	Corrective Action

Revised March 2016

CHEMICAL SAMPLING COMPLETED DURING THIS REPORTING PERIOD

Was any chemical sampling conducted during reporting period? Yes No

If no, when were the last chemical samples conducted for this system? (date) 27-Mar-2020 <input type="checkbox"/> Don't Know <input type="checkbox"/> Never	If yes, did all water samples meet the Guidelines for Canadian Drinking Water Quality? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
--	---

If any water samples did not meet the Guidelines for Canadian Drinking Water Quality, record the results in the table below; attach additional sheets if necessary.

Parameter	Result	Corrective Action / Treatment / Comments

ADDITIONAL TESTING

Does the system have analyzers for continuous monitoring? Yes No

If yes, check all boxes that apply:
 Chlorine Turbidity Other (details) _____

Are the results available on request? _____

If any additional testing or sampling was conducted, record results in the table below; attach additional sheets if necessary.

Additional Testing & Reason for Sampling	Corrective Action Taken

WATER QUALITY COMPLAINTS

Were there any water quality complaints in this reporting period? (e.g. taste, odour, colour etc.) Yes No

If yes, complete the table below; attach additional sheets if necessary.

Date	Water Quality Complaint	Corrective Action / Treatment

Revised March 2016

OPERATIONAL PROBLEMS

Were there any operational problems during this reporting period? (e.g. insufficient water supply, malfunction of disinfection equipment, line breaks, elevated turbidity etc.). Yes No

If yes, complete the table below; attach additional sheets if necessary.

Incident Date	Type of Operational Problem	Corrective Action Taken

MAJOR UPGRADES/REPAIRS & EXPENSES

Were there any major upgrades/repairs or any major costs incurred during this reporting period? Yes No

If yes, complete the table below; attach additional sheets if necessary.

Major Upgrades/Expenses	Details
Improvements required by DWO	
Additions/changes to system	
Purchase or install new equipment	
Equipment repair or replacement	
Annual maintenance of system	
Specialist report	
Other	

FUTURE IMPROVEMENTS

Are there any plans for future improvements? Yes No

If yes, complete the table below; attach additional sheets if necessary.

Future Upgrades or Improvements	Estimated Date of Completion

DATE COMPLETED: 23-Mar-2020	COMPLETED BY: Michael Albrecht
-----------------------------	--------------------------------

Revised March 2016



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 V3S 8P8, Canada

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 E: info.vancouver@element.com
 W: element.com

Report Transmission Cover Page

Bill To: City of Maple Ridge 11995 Haney Place Maple Ridge, BC, Canada V2X 6A9	Project ID: Project Name: Thornhill Hall Water System Project Location: LSD: P.O.:	Lot ID: 1415342 Control Number: Date Received: Mar 24, 2020 Date Reported: Mar 27, 2020 Report Number: 2502408
Attn: Accounts Payable Sampled By: Company:	Proj. Acct. code:	

Contact	Company	Address
Binny Sivia	Fraser Health Authority	400, 2777 Gladwin Road Abbotsford, BC V2T 4V1 Phone: (604) 870-7900 Fax: (604) 852-1558 Email: Binny.Sivia@FraserHealth.ca

Delivery	Format	Deliverables
Email - Single Report	PDF	Test Report

Contact	Company	Address
Mike Albrecht	City of Maple Ridge	Maple Ridge, BC V3S 8P8 Phone: (604) 363-6671 Fax: Email: malbrecht@mapleridge.ca

Delivery	Format	Deliverables
Email - Single Report	PDF	COA
Email - Single Report	PDF	Invoice
Email - Single Report	PDF	Test Report

Notes To Clients:

- Mar 27, 2020 - The analysis of water sample 1415342-1 is below Maximum Acceptable Concentrations for the chemical and bacteriological health related guidelines specified by the June 2019 Guidelines for Canadian Drinking Water Quality for the parameters tested.

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Analytical Report

Bill To: City of Maple Ridge 11995 Haney Place Maple Ridge, BC, Canada V2X 6A9	Project ID: Project Name: Thornhill Hall Water System Project Location: LSD: P.O.:	Lot ID: 1415342 Control Number: Date Received: Mar 24, 2020 Date Reported: Mar 27, 2020 Report Number: 2502408
Attn: Accounts Payable	Proj. Acct. code:	
Sampled By:		
Company:		

Analyte	Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Reference Number 1415342-1					
Sample Date March 24, 2020					
Sample Time 10:30					
Sample Location					
Sample Description Thornhill Hall Water System / 9.0 °C					
Sample Matrix Drinking Water					
Metals Extractable					
Aluminum	Extractable mg/L	0.006	0.001	0.1	Below OG
Antimony	Extractable mg/L	<0.00002	0.00002	0.006	Below MAC
Arsenic	Extractable mg/L	0.0010	0.0001	0.010	Below MAC
Barium	Extractable mg/L	<0.0001	0.0001	2.0	Below MAC
Boron	Extractable mg/L	0.345	0.002	5	Below MAC
Cadmium	Extractable mg/L	<0.00001	0.00001	0.005	Below MAC
Chromium	Extractable mg/L	<0.00005	0.00005	0.05	Below MAC
Copper	Extractable mg/L	<0.0005	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable mg/L	<0.00001	0.00001	0.005	Below MAC
Selenium	Extractable mg/L	<0.0002	0.0002	0.05	Below MAC
Strontium	Extractable mg/L	0.0028	0.0001	7.0	Below MAC
Uranium	Extractable mg/L	<0.00001	0.00001	0.02	Below MAC
Vanadium	Extractable mg/L	0.00040	0.00005		
Zinc	Extractable mg/L	<0.0005	0.0005	5.0	Below AO
Microbiological Analysis					
Total Coliforms	Enzyme Substrate Test MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Physical and Aggregate Properties					
Colour	True Colour units	<5	5		
Turbidity	NTU	0.20	0.1	0.1	Above OG
Routine Water					
pH - Holding Time		Exceeded			
pH	at 25 °C	9.68	0.01	7.0-10.5	Within Range
Electrical Conductivity	µS/cm at 25 °C	141	1		
Calcium	Extractable mg/L	0.48	0.01		
Iron	Extractable mg/L	<0.004	0.004	0.3	Below AO
Magnesium	Extractable mg/L	<0.02	0.02		
Manganese	Extractable mg/L	<0.001	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable mg/L	0.16	0.04		
Silicon	Extractable mg/L	11	0.005		
Sodium	Extractable mg/L	26	0.1	200	Below AO
T-Alkalinity	as CaCO3 mg/L	64	5		
Chloride	Dissolved mg/L	1.65	0.05	250	Below AO
Fluoride	Dissolved mg/L	1.24	0.01	1.5	Below MAC
Nitrate - N	Dissolved mg/L	<0.01	0.01	10	Below MAC
Nitrite - N	Dissolved mg/L	<0.01	0.01	1	Below MAC


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Analytical Report

Bill To: City of Maple Ridge 11995 Haney Place Maple Ridge, BC, Canada V2X 6A9	Project ID: Project Name: Thornhill Hall Water System Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1415342 Control Number: Date Received: Mar 24, 2020 Date Reported: Mar 27, 2020 Report Number: 2502408
Attn: Accounts Payable		
Sampled By: Company:		

Reference Number	1415342-1
Sample Date	March 24, 2020
Sample Time	10:30
Sample Location	
Sample Description	Thornhill Hall Water System / 9.0 °C
Sample Matrix	Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Sulfate (SO4)	Dissolved	mg/L	2.1	0.1	500	Below AO
Hardness	as CaCO3 (extractable)	mg/L	1.2	1		
Total Dissolved Solids	Extractable	mg/L	101	1	500	Below AO

Approved by: 
Matthew Norman, BSc, PChem
Operations Chemist

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.
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Methodology and Notes

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Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Alk, pH, EC, Turb in water (BC)	APHA	* Alkalinity - Titration Method, 2320 B	Mar 26, 2020	Element Vancouver
Alk, pH, EC, Turb in water (BC)	APHA	* Conductivity, 2510 B	Mar 26, 2020	Element Vancouver
Alk, pH, EC, Turb in water (BC)	APHA	* pH - Electrometric Method, 4500-H+ B	Mar 26, 2020	Element Vancouver
Anions by IEC in water (VAN)	APHA	* Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	Mar 24, 2020	Element Vancouver
Metals SemiTrace (Extractable) in water (VAN)	US EPA	* Metals & Trace Elements by ICP-AES, 6010C	Mar 25, 2020	Element Vancouver
Total and E-Coli - Colilert - DW (VAN)	APHA	Enzyme Substrate Test, APHA 9223 B	Mar 24, 2020	Element Vancouver
Trace Metals (extractable) in Water (VAN)	US EPA	* Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	Mar 25, 2020	Element Vancouver
True Color in water (VAN)	APHA	* Spectrophotometric - Single Wavelength Method, 2120 C	Mar 25, 2020	Element Vancouver
Turbidity - Water (VAN)	APHA	* Turbidity - Nephelometric Method, 2130 B	Mar 24, 2020	Element Vancouver

* Reference Method Modified

References

APHA Standard Methods for the Examination of Water and Wastewater
US EPA US Environmental Protection Agency Test Methods

Guidelines

Guideline Description Health Canada GCDWQ
Guideline Source Guidelines for Canadian Drinking Water Quality, Health Canada, June 2019
Guideline Comments MAC = Maximum Acceptable Concentration
AO = Aesthetic Objective
OG = Operational Guideline for Water Treatment Plants
(does not apply to private groundwater wells).
Refer to Health Canada for complete guidelines at www.hc-sc.gc.ca

Comments:

- Mar 27, 2020 - The analysis of water sample 1415342-1 is below Maximum Acceptable Concentrations for the chemical and bacteriological health related guidelines specified by the June 2019 Guidelines for Canadian Drinking Water Quality for the parameters tested.

The comparison of test results to guideline limits is provided for information purposes only. This is not to be taken as a statement of conformance / nonconformance to any guideline, regulation or limit. The data user is responsible for all conclusions drawn with respect to the data and is advised to consult official regulatory references when evaluating compliance.

Please direct any inquiries regarding this report to our Client Services group.
Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

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