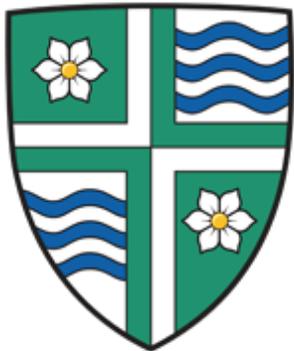


Township of  
Langley



Est. 1873

# 2020 Annual Water Quality Report



June, 2021

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## EXECUTIVE SUMMARY

The Township of Langley has a population of approximately 140,250 and provides water to approximately 117,810 of these residents. Residents not serviced by the Township's water utility, access their water from private or community wells. The Township of Langley's water is sourced from 17 groundwater wells and via the Greater Vancouver Water District (GVWD).

In 2020, source water quality met the requirements of British Columbia Drinking Water Protection Regulations (BC DWPR) and the Guidelines for Drinking Water Quality (GCDWQ) for microbial parameters. There was no E.coli detected in source water samples. While Brookwood Well #10 had a positive Total Coliform sample, it was not in production during 2020.

Some source water samples did however exceed the Maximum Acceptable Concentration (MAC) and Aesthetic Objective (AO) guidelines for semi annual routine parameters. The source samples exceeded the health based MAC limits for Nitrate as Nitrogen and Turbidity. The AO for Iron, Manganese, and pH were also exceeded in the source water samples.

The water from the Aldergrove wells is blended at the Aldergrove Water Treatment Plant to bring all parameters within compliance. Tall Timber wells were disconnected, and the system was connected to the East Langley Water System. To alleviate concerns regarding aesthetics of the water, all wells in the Brookwood and Murrayville areas were taken offline in fall 2019 and remained offline in 2020. Township staff, with the assistance of a qualified professional, conducted a study, which recommended new localized water treatment plants to treat the wells in order to bring the parameters within compliance. Following the recent approval by Council on May 31, 2021, staff will be proceeding with detailed design work.

In the distribution system, there was a total of 11 samples that tested positive for Total Coliforms. There were no E.coli positive samples. The positive test results were communicated to Fraser Health and the Township flushed the sample station and resampled at the site of failure until two consecutive negative samples for the presence of Total Coliform were received in compliance with the Township's Water Emergency Response Plan.

The Township follows the GCDWQ recommended pH operational guideline of 7.0 to 10.5 for finished water. In the distribution system the Township's pH ranged from 5.34 to 9.90 with an average of 7.36. In the source water samples the recommended pH range was under the operational guideline at Aldergrove Well #9 and Fort Langley Well #2.

The 2020 water quality monitoring results indicate that the Township water is potable and safe for residential consumption. Township staff continue to seek improvements to the water supply and distribution systems. The Township will continue to work closely with Fraser Health, GVWD, and the public to continue providing high quality water to our residents.

This report is prepared according to the BC Drinking Water Protection Regulation (Section 11) which requires all water suppliers publish an annual water quality report and ensure that the information be made public.

**ACRONYMS**

AC	Asbestos Cement
ALARA	As low as reasonably achievable
AO	Aesthetic Objective
AWTP	Aldergrove Water Treatment Plant
BTEX	Benzene, Toluene, Ethyl benzene, Xylene
CCCP	Cross Connection Control Program
cfu/mL	Coliform forming units per milliliter
DWPR	Drinking Water Protection Regulation
EMS	Environmental Monitoring System
EOCP	Environmental Operators Certification Program
GARP	Ground Water at Risk of Containing Pathogens
GCDWQ	Health Canada (September 2020) Guidelines for Canadian Drinking Water Quality
GVRD	Greater Vancouver Regional District
GVWD	Greater Vancouver Water District
HAA	Halo Acetic Acid
HPC	Heterotrophic Plate Count
MAC	Maximum Acceptable Concentration
MDL	Minimum Detectable Level
mg/L	Milligram per Litre
mL	Millilitre
ML	Megalitre
MLD	Megalitre per Day
MPN	Most Probable Number
NTA	Nitritotriacetic Acid
NTU	Nephelometric Turbidity Unit
PAH	Polycyclic Aromatic Hydrocarbon
pH	Measure of water acidity, pH of 7 is neutral
PRV	Pressure Reducing Valve
SCADA	Supervisory Control and Data Acquisition
SRU	Salmon River Uplands
THM	Trihalomethane
TOC	Total Organic Carbon
TOL	Township of Langley
VOC	Volatile Organic Carbon
WERP	Water Emergency Response Plan
WQMRP	Water Quality Monitoring and Reporting Plan (for GVRD and member municipalities)

## INTRODUCTION

The Township of Langley is home to approximately 140,250 residents and provides water to approximately 117,810 of these residents. The residents not serviced by the Township access water from private or community wells. Township water is sourced from 17 groundwater wells and via the Greater Vancouver Water District (GVWD).

The BC Drinking Water Protection Regulation (DWPR) (Section 11) requires all water suppliers to produce and make public an annual water quality report. This report, along with previous annual reports, is available in hard copy at the Township's Civic Facility, 20338 – 65 Avenue, Langley, BC or in PDF format at [www.tol.ca](http://www.tol.ca). This report provides an overview of the Township's water system and documents the test results of its well water and distribution water quality monitoring program.

## 1.0 SYSTEM DESCRIPTION

The Township encompasses a 316 km<sup>2</sup> area bounded by the Fraser River to the north, 196 Street to the west, 0 Avenue to the south, and 276 Street to the east. Excluded from this area is the City of Langley which is situated on the western boundary. The Township also borders the Kwantlen, Katzie and Matsqui First Nations communities and provides water to the Kwantlen and Katzie communities.

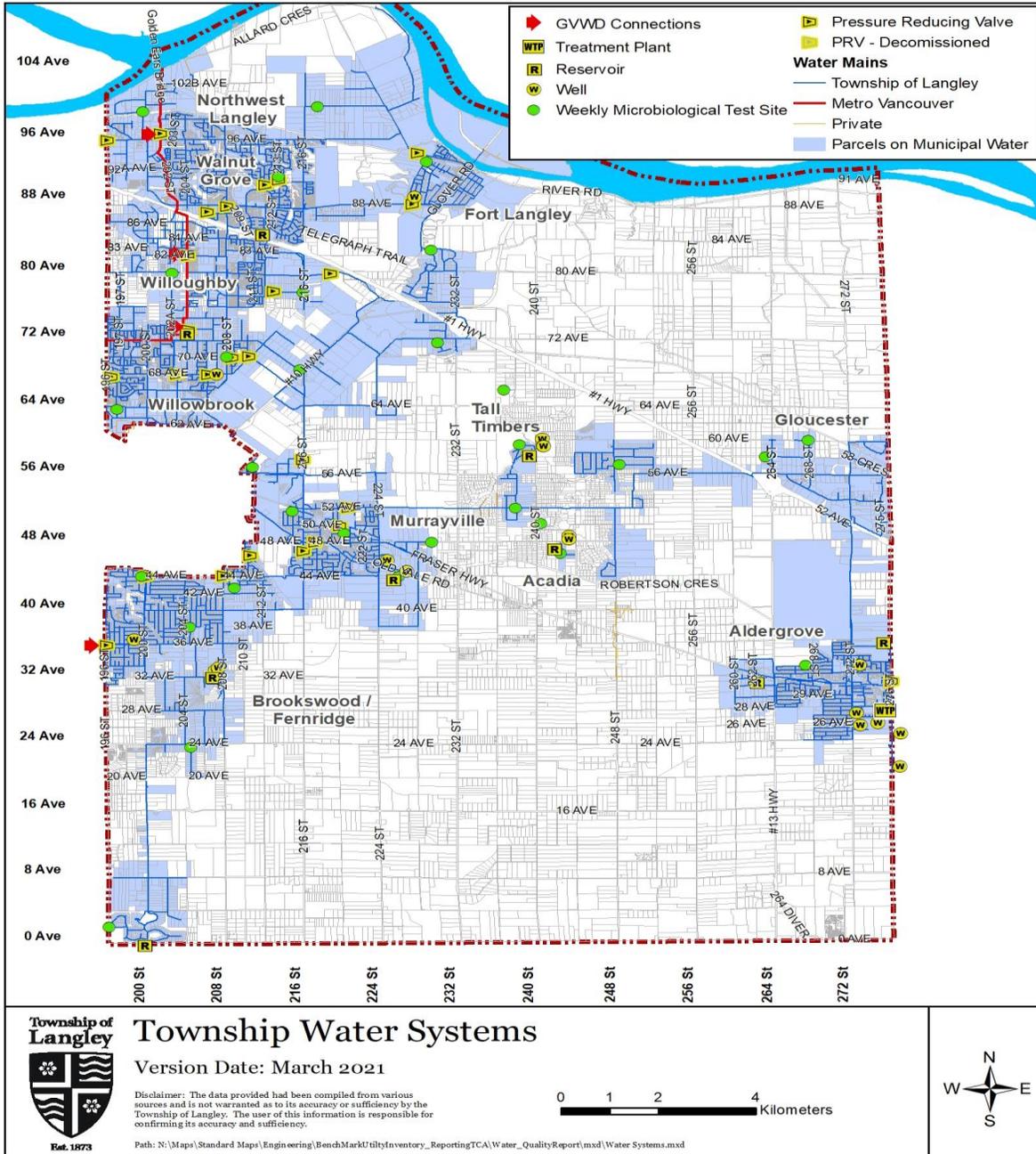


Figure 1.0 All Water Systems

## 2.0 WATER – THE BIG PICTURE

The Township supplements its groundwater sources with potable water from GVWD (mainly Coquitlam Lake) transmission mains. Most of the Township is supplied water by a combination of GVWD water and municipal groundwater wells. The central community of Acadia is only supplied water by the municipal groundwater wells. Tall Timber was supplied water by only municipal groundwater wells for most of the year, but it was connected to the East Langley Water System (ELWS) in fall 2020. Some farming properties have both a municipal water connection for domestic consumption and a private well for irrigation purposes. The remaining properties obtain water from private wells. In 2020 GVWD provided 70% of the Township's water supply and municipal groundwater wells provided the other 30%.

In case of an emergency there are water inter-connections between the Township of Langley, Langley City, City of Abbotsford, and City of Surrey.

There are five separate municipal water systems in the Township:

- Northwest Langley ([Figure 2.0.1](#)),
- Southwest Langley ([Figure 2.0.2](#)),
- East Langley ([Figure 2.0.3](#)), Tall Timber (part of East Langley as of fall 2020) ([Figure 2.0.3](#)), and
- Acadia ([Figure 2.0.3](#))

In 2016, the completion of the East Langley Water Supply project connected the Gloucester Industrial Estates, Salmon River Uplands, and Aldergrove to the GVWD water source. In fall of 2020, the Tall Timber system was also connected to ELWS. [Table 2.0.1](#) provides location information for these municipal water systems and [Figures 2.0.1](#), [2.0.2](#) and [2.0.3](#) map the individual water systems.

Northwest Langley consists of the communities and neighbourhoods of Walnut Grove, Fort Langley, University District, Milner, Willoughby, Willowbrook, and Forest Knolls. The GVWD Barnston Island Water Main runs north-south through Northwest Langley, and delivers water through one point in northern Walnut Grove and two points in Willoughby. Northwest Langley also receives potable water year-round from the municipal Fort Langley Well 2. Emergency storage is provided at Strawberry Reservoir located in Walnut Grove and at Willoughby Reservoir. The Willoughby Pump Station, located adjacent to the Willoughby Reservoir, draws from the GVWD main and adjusts pressure to meet system requirements.

The Southwest communities and neighbourhoods of Brookwood, Fernridge, High Point, and Murrayville blend water from the GVWD main near 36 Avenue and 196 Street, and from Township operated wells in Brookwood (Brookwood Wells 7, 9, and 10) and Murrayville (Murrayville Wells 1 and 2). The lower Murrayville area is supplied by the ELWS. It should be noted that the Murrayville and Brookwood wells remained offline in 2020 due to aesthetic water concerns.

The Brookwood Pump Station, located at the GVWD connection, is operated as a booster station when adequate system pressures cannot be maintained directly from the GVWD main. The distribution system also includes above grade reservoirs in Brookwood (2), Murrayville (1), and High Point (1), and booster stations in Murrayville, Brookwood/Fernridge, and High Point.

The ELWS consists of the communities and neighbourhoods of Salmon River Uplands, Gloucester Industrial Estates, Tall Timber, and Aldergrove. Water is supplied from GVWD via the Brawn Pump Station, and from 6 groundwater wells in Aldergrove via the Aldergrove Water Treatment Plant (AWTP).

The AWTP provides a multi-barrier treatment approach to improve water quality to East Langley by filtration of manganese and iron aesthetic parameters. AWTP was designed to meet or exceed the GCDWQ (in 1997) and for a maximum day design capacity of 10 MLD. The AWTP during normal operation supplies 6 MLD of water.

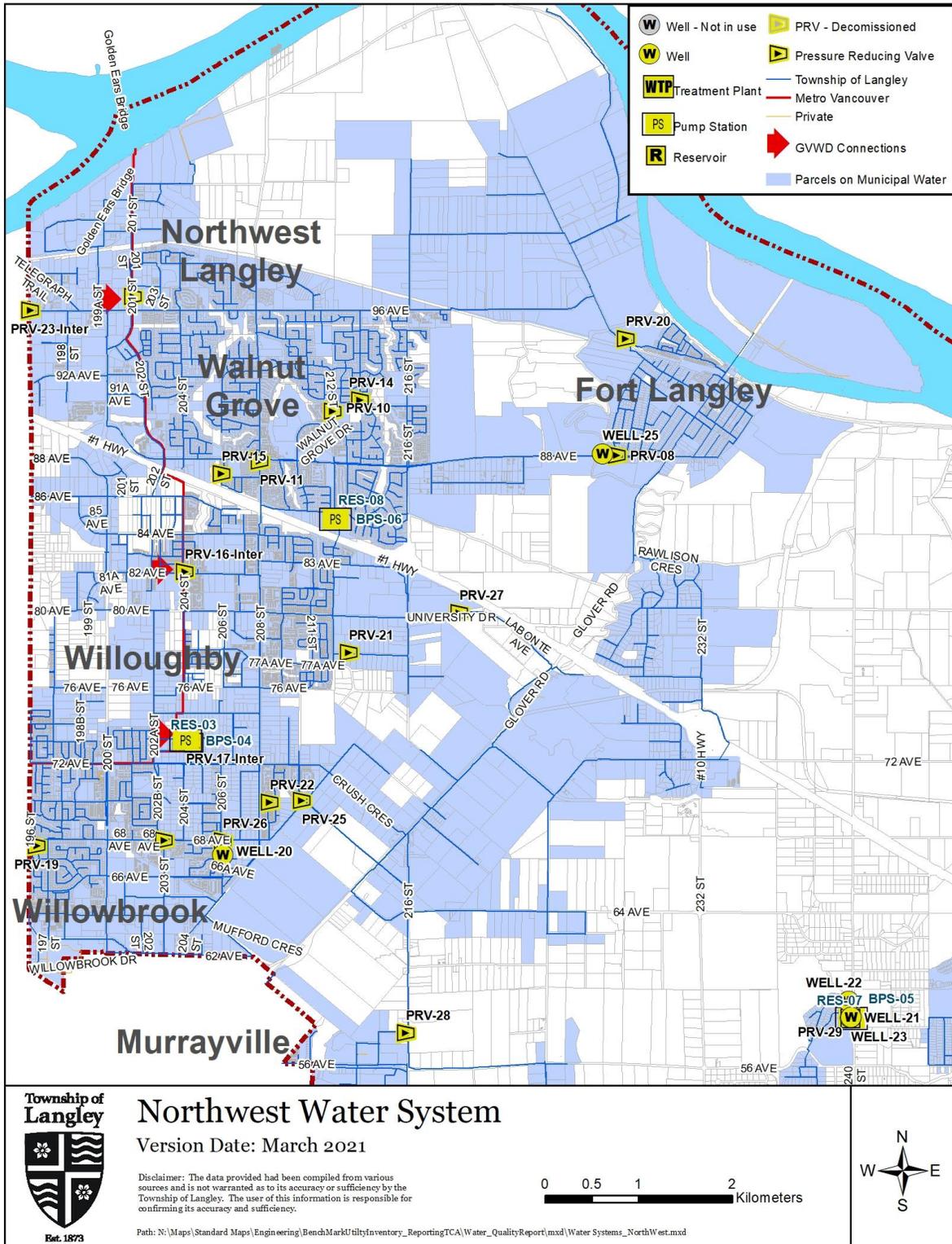


Aldergrove Water Treatment Plant

Tall Timber and Acadia systems are small water systems run by the Township. Tall Timber consists of 75 homes previously serviced by Tall Timber Well 1, Tall Timber Well 2, and Tall Timber Well 3. The Tall Timber system was connected to the ELWS in the fall of 2020 and the Tall Timber wells and reservoir were disconnected. The Acadia community consists of 29 homes, served by Acadia Well 1 and Acadia Well 2.

The Township does not operate the private Otter Road and Last Chance community systems.

The Annual Water Demand was 16,256.3 ML; 4,829.1 ML or 30% was supplied from Township wells and 11,427.2 ML or 70% from GVWD. An increase of 1.5% in water demand from 2019 is mainly attributed to construction and population growth. The average daily residential per capita water consumption was approximately 258 L. There was a slight increase in the average daily residential per capita water consumption which can be attributed to residents working from home due to Covid-19. Production from all sources is summarized in [Table 2.0.2](#) well depths, rated capacity, and rehabilitation schedules are shown in [Table 2.0.3](#).



## Northwest Water System

Version Date: March 2021

Disclaimer: The data provided had been compiled from various sources and is not warranted as to its accuracy or sufficiency by the Township of Langley. The user of this information is responsible for confirming its accuracy and sufficiency.

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Figure 2.0.1 Northwest Water System

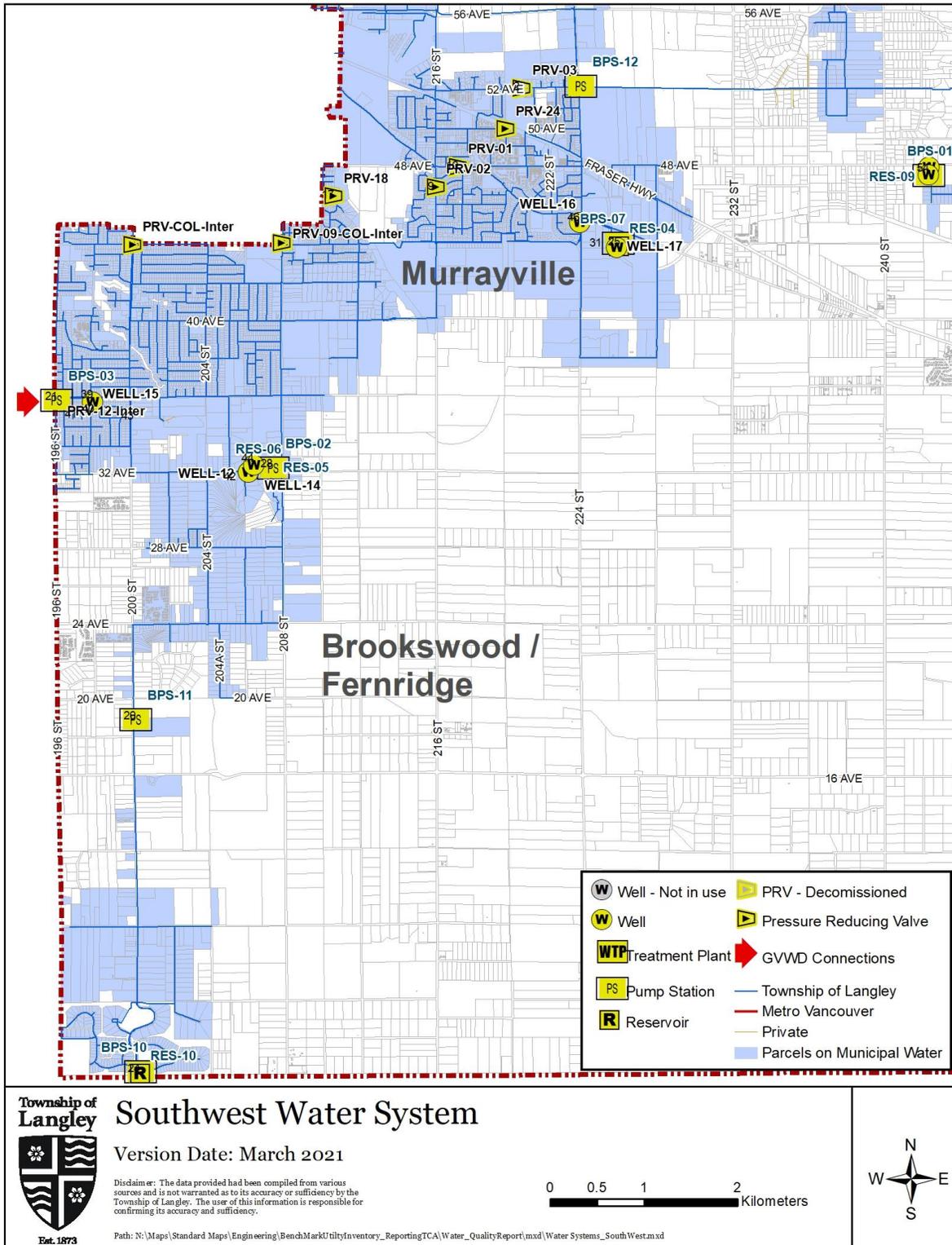


Figure 2.0.2 Southwest Water System

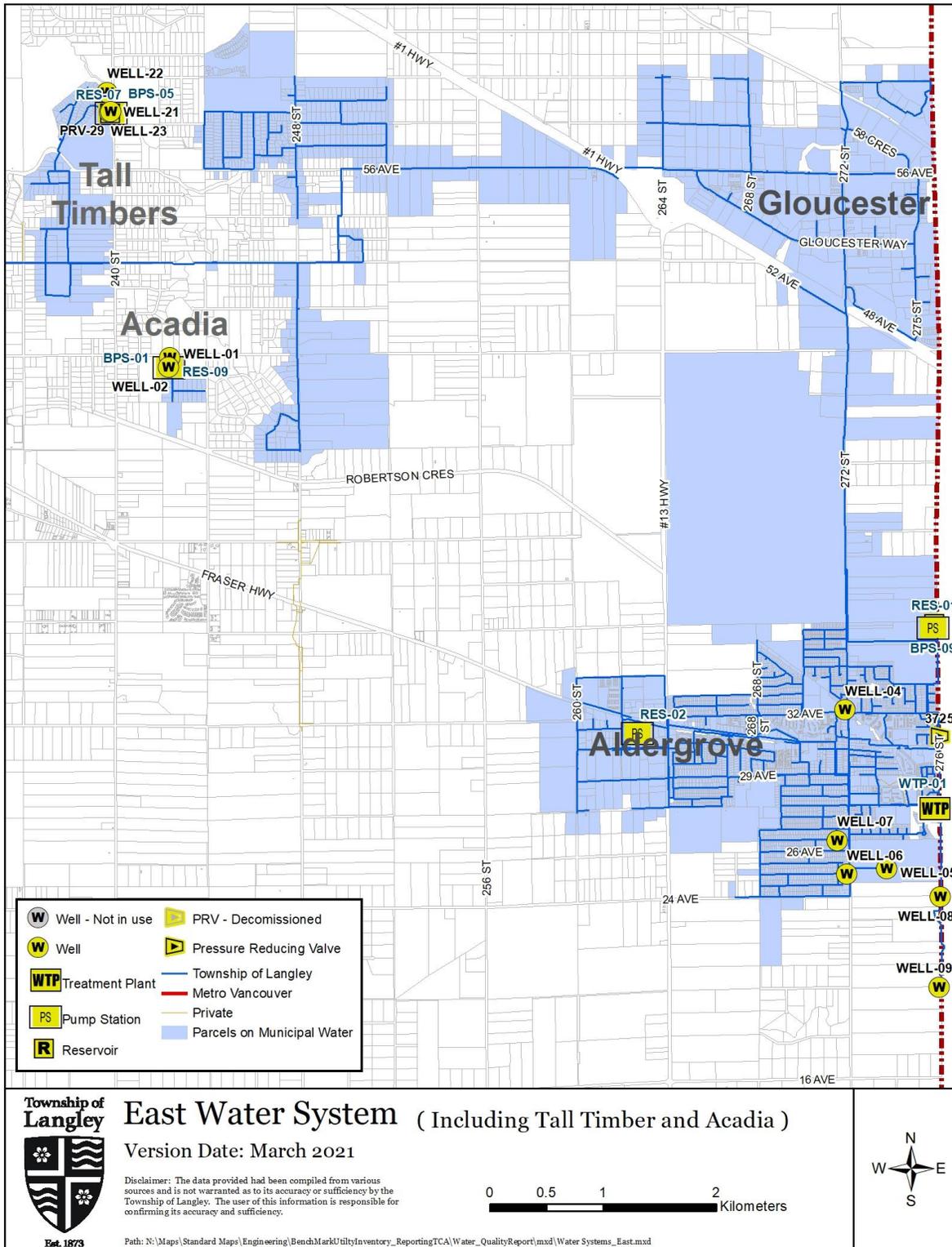


Figure 2.0.3 East Water System

Table 2.0.1 Locations for Figures 2.0.1, 2.0.2, and 2.0.3.

Name	Location	Name	Location
PRV - 52 Ave, MV71	22132 52 Ave	Pump Stn & Res. - Murrayville	22566 Old Yale Rd
PRV - 196B St, WB81	6739 196B Pl	Pump Stn & Res.-Strawberry Hill	21212 85 Ave
PRV - 203 St, WB81	20302 68 Ave	Pump - Acadia Well #2	4791 242A St
PRV - 206 St, WB81	6795 206 St	Pump Station & Reservoir- W. Aldergrove	3120 262B St
PRV - 208 St, WG81	8790 208 St	Booster Stn – Brawn	5202 224 St
PRV - 212 St, WG81	9045 212 St	Booster Stn – Acadia	4745 242A St
PRV - 213 St, WG81	9120 213 St	Res & B. Stn - Brookwood	20771 32 Ave
PRV - 216 St, MV71	4681 - 216 St	Res & B. Stn – High Point	20020 1st Ave
PRV - 48 Ave, MV71	21720 48 Ave	Reservoir - Brookwood	20771 32 Avenue
PRV - 78 Ave, WB111	21282 78 Ave	Reservoir – Willoughby Booster	20438 73A Ave
PRV - 87 Ave, WG81	8749 206 St	AWTP	2799 276 Street
PRV - 88 Ave, FL63	22779 88 Ave	Well - Murrayville 2	22566 Old Yale Rd
PRV – Billy Brown, FL63	22862 Billy Brown Rd	Well - Aldergrove 10	2071 Lefevre St
PRV - Maysfield Cr, MV71	4604 Maysfield Cr	Well - Aldergrove 4	3210 272 St
PRV(GVRD) - 201 St, WG81	9650 201 St	Well – Aldergrove 6	2520 272 St
PRV(GVRD) - 82Ave, WB111	20415 82 Ave	Well - Aldergrove 7	27186 25 St
PRV - 50 Ave, MV71	4994 220 St	Well - Aldergrove 8	2623 271A St
PRV – 70 Ave, MV71	7000 208A St	Well - Aldergrove 9	27598 Simpson Rd
PRV – Tall Timber	23990 58A Ave	Well - Brookwood 10	19810 36 Ave
PRV – McLeod, MV81	21574 58 Ave	Well - Brookwood 7	20650 32 Ave
PRV – Labonte, WB81	21840 University Dr	Well - Brookwood 9	20679 32 Ave
PRV - 70 Ave	7000 208A St	Well - Fort Langley 2	22721 88 Ave
PRV – Worrell, WB81	6990 210 St	Well - Murrayville 1	4505 244 St
Pump - 19th Ave Booster Stn	1898 200 St	Well - SRU 3 - Not in use	5975 252 St
Pump - Brookwood B. Stn/PRV	19638 36 Ave	Well - Tall Timber 2 – Not in use	6099 237A St
Pump Stn & PRV - Willoughby B. Stn	20400 73a Ave	Well - Willoughby 1 – Not in use	6725 206 St
Pump Stn & Res. - E. Aldergrove	27595 Quinton Rd	Well & System - Tall Timber 1 & 3 – Not in use	23990 58A Ave
Pump Stn & Res. - High Point	20020 1 Ave	Well - Acadia Water System 1	4791 242A St

Table 2.0.2 Annual Water Volume by Source (m<sup>3</sup>)

Source	2017	2018	2019	2020
Aldergrove 3	43,570	-	-	
Aldergrove 4	39,753	106,909	51,540	125,177
Aldergrove 6	229,041	250,323	224,549	168,898
Aldergrove 7	182,040	215,530	200,766	209,055
Aldergrove 8	432,867	407,365	432,792	486,339
Aldergrove 9	213,866	259,393	147,954	233,285
Aldergrove 10	245,401	349,346	272,124	336,660
Brawn PS GVWD*	1,086,371	1,055,432	1,182,241	1,094,289
AWTP Inflow	1,537,511	1,729,882	1,473,316	1,708,965
AWTP Outflow	1,501,603	1,686,125	1,412,210	1,633,667
<b>Aldergrove Total</b>	<b>2,472,909</b>	<b>2,644,298</b>	<b>2,511,966</b>	<b>2,653,702</b>
Brookwood 7	433,744	415,558	359,945	9,195**
Brookwood 9	332,667	357,000	317,000	- **
Brookwood 10	397,500	395,509	304,125	206**
Brookwood PRV	1,285,860	1,413,540	1,515,101	2,949,104
Murrayville 1	174,247	119,538	160,365	185**
Murrayville 2	544,185	602,615	498,994	398**
McLeod PRV*	-	-	87,675	166,802
<b>Brookwood and Murrayville Total</b>	<b>3,168,203</b>	<b>3,303,760</b>	<b>3,243,205</b>	<b>3,125,889</b>
Willoughby 1	-	838	-	1,607
Fort Langley 2	3,058,066	2,963,240	2,936,626	3,156,730
201 St GVWD	1,635,615	1,750,710	1,898,698	1,610,412
82 Ave GVWD	2,495,692	2,492,562	2,622,151	2,871,504
73 A Ave GVWD	1,330,630	1,568,340	1,484,806	2,041,145
Willoughby Pumped GVWD	662,403	643,245	796,545	528,626
72B Ave GVWD*	1,570,200	1,532,240	1,681,819	1,426,460
Worrell PRV *	-	476,808	354,820	343,136
<b>West Langley Total</b>	<b>10,752,606</b>	<b>10,951,175</b>	<b>11,420,645</b>	<b>11,636,484</b>
Tall Timber 1	7,839	6,796	6,876	6,979
Tall Timber 2	10,021	12,008	9,504	7,739
Tall Timber 3	7,944	7,014	7,070	4,928
<b>Tall Timber Total</b>	<b>25,804</b>	<b>25,818</b>	<b>23,450</b>	<b>19,646</b>
<b>Acadia Total</b>	<b>8,693</b>	<b>8,743</b>	<b>7,389</b>	<b>7,443</b>
Total Langley Well Production	6,476,509	6,574,984	6,020,104	4,829,077
Total GVWD	8,980,400	9,400,637	9,999,121	11,427,250
<b>Combined Total</b>	<b>15,456,909</b>	<b>15,975,621</b>	<b>16,019,225</b>	<b>16,256,327</b>

\*Aldergrove outflow meter at AWTP is used in the Combined Total calculations in the table above. Also, readings for the GVWD main running from Willoughby to Aldergrove is read at 72B Ave GVWD, Brawn PRV, Worrell PRV, and McLeod PRV. Only the reading at 72B Ave is used in the Combined Total calculations to avoid any discrepancies and meter reading errors. This meter was disconnected in November 2020 and will be replaced by a GVWD meter in 2021.

\*\*Water production displayed for wells in Murrayville and Brookswood were run to waste and not pumped into the distribution system.

It should also be noted that [Table 2.0.2](#) has been updated for this year and for the past three years. The table from this report supersedes past years' reports.

Table 2.0.3 Municipal Well Data

Well Name	EMS #	Year Drilled	Rated Capacity (L/s)	Depth (m)	Year Redevelopment
Acadia Well 1	E243968	1973	4.5	49	2001/2011
Acadia Well 2	E218073	2008	3.5	43	
Aldergrove Well 3	E218080	1972	19	39	Decommissioned in 2019
Aldergrove Well 4	E218079	1977	13	31	2000/2010
Aldergrove Well 6	E244334	1995	44	34	2007/2010/2013/2015
Aldergrove Well 7	E218082	1978	44	34	2004/2010/2014
Aldergrove Well 8	E218081	1985	57	44	2002/2003/2009
Aldergrove Well 9	E259837	2004	30	41	2009
Aldergrove Well 10	E259838	2005	45	50	2012
Brookswood Well 7	E218071	1977	32	59	2001/2003/2011
Brookswood Well 9	E218072	1988	30	43	2001/2003/2010/2013
Brookswood Well 10	E244194	1960	22	31	1998/2008/2012
Murrayville Well 1	E218084	1978	15	117	2006
Murrayville Well 2	E218085	1978	26	68	2007
SRU Well 3	EMS # unavailable	1989	-		Disconnected, not in production
Willoughby Well 1	E218083	1978	19	120	Back up well, not in production
Tall Timber Well 1	E218074	1980	3.8	72	Disconnected in fall 2020
Tall Timber Well 2	E218075	1983	2	60	Disconnected in fall 2020
Tall Timber Well 3	EMS # unavailable	2008	4.1	73	Disconnected in fall 2020
Fort Langley Well 1	E218065				Disconnected, not in production
Fort Langley Well 2	E218066	1976	136	21	2005/2013/2015/2017

## 2.1 System Inventory

Water is supplied through 555.7km of water main. Approximately 1km of new water main was installed in 2020. Of the various pipe materials PVC represents 66%. A breakdown is found below in Table 2.1.1.

Table 2.1.1 Distribution Pipe Inventory

Years	Diameter (mm)	Asbestos Cement (m)	Cast Iron (m)	Ductile Iron (m)	HDPE (m)	Perma (m)	PVC (m)	PVCO (m)	Steel (m)	Unknown (m)	Grand Total (m)
1960-1969	50	57					141				198
1960-1969	100	1,717									1,717
1960-1969	150	3,616									3,616
1960-1969	200	7									7
1960-1969	250	138									138
<b>1960-1969</b>	<b>Total</b>	<b>5,535</b>					<b>141</b>				<b>5,675</b>
1970-1979	50	76					40				116
1970-1979	100	2,674					770				3,444
1970-1979	150	50,758		9,629			23,853			3	84,242
1970-1979	200	7,244		7,615		105	6,094				21,058
1970-1979	250	5,755		5,594		187	3,503				15,039
1970-1979	300	2,975		7,638		831	2,311				13,755
1970-1979	350	67	2,504	1,713							4,285
1970-1979	400	2,900	1,231	1,687	2						5,820
1970-1979	450				253						253
1970-1979	500		2,547	1,357							3,904
1970-1979							2				2
<b>1970-1979</b>	<b>Total</b>	<b>72,449</b>	<b>6,282</b>	<b>35,234</b>	<b>255</b>	<b>1,124</b>	<b>36,572</b>			<b>3</b>	<b>151,919</b>
1980-1989	25						1				1
1980-1989	50						175				175
1980-1989	100			259			3,251				3,510
1980-1989	150	5,818		8,598	17	62	44,715				59,210
1980-1989	200			848		12	23,745				24,605
1980-1989	250	95		2,491		128	15,866				18,581
1980-1989	300	3		1,109		1,177	4,532				6,820
1980-1989	350			2,337			632				2,969
1980-1989	400	1,725		1,268			401				3,394
1980-1989	450	2,082									2,082
1980-1989	500			3,602							3,602
1980-1989	600			632					795		1,427
1980-1989							304				304
<b>1980-1989</b>	<b>Total</b>	<b>9,723</b>		<b>21,143</b>	<b>17</b>	<b>1,378</b>	<b>93,622</b>		<b>795</b>		<b>126,678</b>

Years	Diameter (mm)	Asbestos Cement (m)	Cast Iron (m)	Ductile Iron (m)	HDPE (m)	Perma (m)	PVC (m)	PVCO (m)	Steel (m)	Unknown (m)	Grand Total (m)
1990-1999	50				208		154				362
1990-1999	100			391			2,767				3,158
1990-1999	150	134		119			24,518				24,771
1990-1999	200						30,947				30,947
1990-1999	250	212		3,054			21,023			22	24,311
1990-1999	300			3,326			15,003				18,329
1990-1999	350			178			1,159				1,337
1990-1999	400			3,359			6,948				10,307
1990-1999	450			592			1,509				2,101
1990-1999	500			118							118
1990-1999	600			2					831		834
1990-1999	750								21		21
1990-1999										4	4
<b>1990-1999</b>	<b>Total</b>	<b>346</b>		<b>11,140</b>	<b>208</b>		<b>104,028</b>		<b>852</b>	<b>26</b>	<b>116,600</b>
2000-2009	50						143				143
2000-2009	100			48			3,074			132	3,255
2000-2009	150			54	1,045		8,078				9,177
2000-2009	200			820	9		35,900			118	36,848
2000-2009	250			155			13,951		6		14,112
2000-2009	300			566	779	324	13,531				15,199
2000-2009	350				920		1,265				2,185
2000-2009	400			116			5,010				5,126
2000-2009	450			279							279
2000-2009										4	4
<b>2000-2009</b>	<b>Total</b>			<b>2,039</b>	<b>2,753</b>	<b>324</b>	<b>80,952</b>		<b>6</b>	<b>255</b>	<b>86,329</b>
2010-2019	25						18				18
2010-2019	100				59		930	316			1,305
2010-2019	150			14			1,416			2	1,432
2010-2019	200			5	3		31,622	1,225		4	32,859
2010-2019	250			39	1,173		7,609				8,821
2010-2019	300			1,078	103		5,221				6,402
2010-2019	350			1,048			36				1,084
2010-2019	400			1,104			416				1,519
2010-2019	450			123							123
2010-2019	500			147							147
2010-2019	600			2,913							2,913
2010-2019	750			3,247							3,247
2010-2019	900								7,424		7,424

Years	Diameter (mm)	Asbestos Cement (m)	Cast Iron (m)	Ductile Iron (m)	HDPE (m)	Perma (m)	PVC (m)	PVCO (m)	Steel (m)	Unknown (m)	Grand Total (m)
2010-2019							3			113	116
<b>2010-2019</b>	<b>Total</b>			<b>9,718</b>	<b>1,337</b>		<b>47,271</b>	<b>1,541</b>	<b>7,424</b>	<b>118</b>	<b>67,409</b>
2020-2029	100						52				52
2020-2029	200						467				467
2020-2029	250						420				420
2020-2029	300						191				191
<b>2020-2029</b>	<b>Total</b>						<b>1,130</b>				<b>1,130</b>
	<b>Grand Total (m)</b>	<b>88,052</b>	<b>6,282</b>	<b>79,274</b>	<b>4,569</b>	<b>2,825</b>	<b>363,717</b>	<b>1,541</b>	<b>9,078</b>	<b>402</b>	<b>555,741</b>

\*Perma is Fiberglass reinforced concrete pipe

## 2.2 Cross Connection Control Program



A Cross Connection Control Program (CCCP) mitigates the risk of introducing potentially contaminated water into the drinking water system. The introduction of contaminated water could result from either excessive pressure in the private water system or a loss of pressure in the municipal water system. Many solutions exist to protect the Township’s safe drinking water including widespread education, assessing backflow risks, and installing backflow preventers. The

Township has successfully implemented the first stage of its CCCP and is transitioning into the implementation of an effective and leading-edge program.

The Township is tracking 4,799 active backflow preventers as of the end of 2020. Of these devices, 375 were new installations. Some 120 backflow preventers failed their annual test and required follow-up cleaning or repairs and retesting. Backflow preventers are installed in new Industrial/Commercial/Institutional (ICI) facilities, during plumbing upgrades or changes in occupancy, or as a result of inspection requirements. Backflow preventer test reports are submitted by the Owner or Certified Backflow Preventer Tester annually as required by the Township of Langley Waterworks Regulation Bylaw 2008 No. 4697, as amended.

In 2020, there were no events warranting further investigation for potential backflow.

The DWPR (Section 15) states,

“For the purpose of section 22(3) of the Act, an assessment response plan must include provisions to identify, eliminate and prevent cross connections with non-potable water sources”.

The Township’s CCCP derives its authority from the Langley Waterworks Regulation Bylaw 2008 No. 4697, as amended. As an evolving field, developing a CCCP includes updating the bylaws and policies while considering the recommendations of the B.C. Water and Waste Association’s Cross Connection Control Committee. The Water Emergency Response Plan

(WERP) contains an action plan in the case of an unknown contamination and potential backflow. The action plan lists when to activate the plan, appropriate persons to contact, and appropriate water sampling plan to monitor the water quality.

Next steps in implementing a leading edge CCCP include:

- develop and update policies and procedures;
- continue to perform inspections and surveys;
- mitigate risk and provide solutions;
- investigate actual or potential cross connections; and
- implement strategic asset management initiatives.

### 2.3 System Maintenance

The Township has a team of four exempt staff and 21 full time personnel assigned to the municipal water system. The 2020 staff complement was 17 regular full time (RFT) field staff, 4 RFT technical staff, 10 temporary full time (TFT) field staff, and 2 TFT technical staff assigned to the operations management, maintenance, monitoring, and repair of the water utility system. Along with the Utilities Operations staff which perform operational and maintenance works, Water Resources and Environment staff help to design and plan new capital works and large scale projects.

Programs geared to enhancing water quality include:

- water main looping in areas of new construction which reduces the amount of low circulation areas, bacterial re-growth, and areas of stagnant water;
- preventative pump and system maintenance such as reservoir cleaning, PRV maintenance, air valve maintenance, etc.; and
- a leak detection program.

### Flushing



The Township water distribution staff performs an annual uni-directional flushing program to maintain high water quality throughout the distribution system. Regular water main flushing is an important component of a comprehensive water management program to prevent bacterial re-growth and stagnation in low circulation areas of the distribution system. The program aims to flush the entire water system, approximately 550km of mains, prior to and following seasonal water restrictions. In 2019, the Walnut Grove flushing plan was reviewed by an engineering consultant to confirm the adequacy of the plan as a whole.

In addition to flushing the Township ensures that in areas of new construction water mains are looped to reduce the amount of areas with low circulation, bacterial re-growth, and stagnant water.

Operations staff also perform preventative and reactive maintenance which includes:

- maintaining pumps, PRVs, reservoirs, chlorinators, and air valves;
- monitoring water quality;
- responding to resident service requests;
- monitoring flow and pressure;
- monitoring chlorine residuals;
- conducting station inspections with health authorities;
- maintaining operations at the water treatment plant.

### Pipe replacement

Approximately 1 km of new water main was installed in 2020. There were no water main rehabilitation projects.

### Storage reservoir cleaning and inspection

Reservoirs are useful for fire protection/emergency as well as daily storage to equalize peak daytime demand, amongst various other benefits. The cleaning and inspection process ensures the reservoirs are structurally sound, sealed, and not exposed to external contamination including wildlife. The benefits of routine reservoir cleaning include decreasing microbial growth and turbidity in the water.



In 2020, the West Aldergrove reservoir was cleaned by a contractor.

In 2021, Highpoint reservoir cell #1 and East Aldergrove reservoir are scheduled to be cleaned.

The Township conducted condition assessments of its water infrastructure. The assessments flagged significant concerns with the structural condition of the Township reservoirs. A structural engineering

consultant was retained by the Township to conduct structural assessment of the Murrayville reservoir. The consultant recommended to take the reservoir offline due its excessive deteriorating condition. The Murrayville reservoir was disconnected from the distribution system in fall 2020.

Township staff are also undertaking structural assessment of East Aldergrove, West Aldergrove, East Brookwood, West Brookwood and Strawberry reservoirs with care being given to reservoirs that show signs of deterioration or leaks. The reservoirs will be repaired as deemed necessary by the structural assessment study.

## Leak Detection Program



A Leak Detection Pilot Project was implemented in the latter part of 2017, became a full program in 2018, and continued through 2019 and 2020. The purpose of the program is to use leak detection equipment in a systematic manner to determine which water mains and appurtenances have the potential to cause disruption of service and/or require repair/replacement. By proactively looking for water loss and water theft, the Township strives to eliminate unaccounted for water and water waste, as well as reduce potential infrastructure damage. Over the coming years, this leak data

will be correlated with the facility condition data using asset maintenance planning software, to build a capital works planning budget.

The Township of Langley water system infrastructure is maintained by a well trained staff. Staff carry out a number of maintenance programs to keep the infrastructure in optimal operation.

### 2.4 Staff Training and Operation Levels

The DWPR (Section 12) states:

*“a person is qualified to operate, maintain or repair a water supply system if the person is certified by the Environmental Operators Certification Program for that class of system as classified under the Environmental Operators Certification Program.”*

The Environmental Operators Certification Program (EOCP) classified the Township’s water distribution systems as Levels I through IV and the water treatment plant as Level II. In addition to meeting the DWPR requirements, the Permit to Operate requires the Township to have a water system Operator with a certification level equivalent to the designated EOCP level. The Township continuously trains Operators in order to maximize the performance of the water system, minimize health and environmental risks, and raise the level of certifications achieved.

The highest level of EOCP Certifications attained are three Level IV Operators, three Level III Operators, nine Level II Operators, eight Level I Operator, and one Operator in Training (OIT) for a total of 23 Certified Water Distribution Operators and one OIT. The Township also has five Level II, three level I, and one OIT Water Treatment Operators. Furthermore, four Applied Science Technologists and Technicians of BC (ASCTT BC) technical staff and one Professional Engineer with in-depth knowledge of the water system to complement and support the Utilities Operations team.

### 2.5 Emergency Response and Contingency Plan

The WERP is part of an overall Engineering Department Emergency Plan, addresses potential hazards such as earthquakes, floods, severe storms, and water security. Outlined in the plan are procedures dealing with the effects of various scenarios: loss of water supply, loss of power, contamination, or damage to any pipelines. Currently, this is a standalone document to deal with a water emergency that is managed by Utilities Operations staff.

Activation of the plan occurs when information is received that an emergency exists, either through staff or external agencies. Staff is directed to determine the event location and nature, isolate or eliminate the hazard in collaboration with other agencies if applicable, and ultimately restore normal water service. The plan encompasses risks and responses, problem indicators, and restoration plans.

The WERP is reviewed and updated as needed on an ongoing basis.

## 2.6 Murrayville Aesthetic Water Issues

In 2019, the Murrayville area experienced a high number of aesthetic water related incidents. The Township received complaints from Murrayville residents regarding brown or yellow coloured water. The Township engaged in water main flushing of the hotspots where these issues were reported and upon an increase in the number of aesthetic water incidents a full water system flush of the Murrayville area was completed in fall 2019.

The aesthetic issues in the Murrayville water supply are caused by the reaction of chlorine with the manganese and iron that is present in all water sourced from the groundwater wells in the area. The chlorine reacts with the manganese and iron and causes it to precipitate out of solution resulting in a yellow or brown tint to the water. Under normal operation the water is consumed before this reaction can fully take place; but if the water remains in the distribution system for a longer period of time or if there is spike in the chlorine concentration the manganese and iron can precipitate. Additionally, when the temperature increases bacterial growth in the water main can also increase which requires more chlorine to fight the bacteria, resulting in even more manganese and iron precipitating out. It should be noted that with the exception of Brookwood well #10, all of the wells servicing Murrayville are within the health-based MAC guideline. The issue is solely with the aesthetic based AO guideline. As per the GCDWQ technical document on manganese:

Concerns regarding the presence of manganese in drinking water are often related to consumer complaints regarding discoloured water. The aesthetic objective (AO) of 0.02 mg/L (20 µg/L) is intended to minimize the occurrence of discoloured water complaints based on the presence of manganese oxides and to improve consumer confidence in drinking water quality.

In May 2019, Health Canada established a health-based Maximum Acceptable Concentration (MAC) value for manganese in drinking water of 0.12 mg/L and lowered the Aesthetic Objective (AO) to 0.02 mg/L. The water in Murrayville is sourced via the local groundwater wells and from GVWD. The groundwater wells in the Murrayville and Brookwood area which supply the Murrayville area, all exceed the AO limit for Manganese.

All the wells supplying Murrayville were subsequently turned off and taken out of production to combat the AO limit exceedance. The water from Brookwood wells is also conveyed into Murrayville and subsequently those wells were also turned off. Brookwood well #10 was taken out of production in October 2019. Murrayville well #2 was taken out of production in November 2019. Murrayville well #1 was taken out of production in December 2019. Brookwood well #7 and #9 were taken out of production in January 2020. The Murrayville and Brookwood areas are currently being supplied with water only from GVWD. The Township has conducted a study with an engineering consultant, which recommended new localized water treatment plants to

resolve the water quality issues in Murrayville and Brookwood. Following the recent approval by Council on May 31, 2021, staff will be proceeding with detailed design work.

## 2.7 Auditor General for Local Government Audit Report Summary, Action Items and Updates

In August 2017, the Township was informed that the Auditor General for Local Government (AGLG) was going to undertake an audit of the Township' water utility system. The Township was selected based on risks, potential relevance of findings to other local governments, the size, geographic location and complexity of the water supply system. The overall goal of the audit was identified as providing an objective and independent examination of drinking water services in the Township to determine whether clean and safe drinking water is being provided to the users on the Township's water utility system.

The AGLG report focused on four key audit objectives:

1. The local government's governance structure and activities supported the provision of clean and safe drinking water where and when needed.
2. The local government managed its drinking water supplies to meet current and expected future demand.
3. The local government ensured the safety and reliability of drinking water provided through its treatment and distribution systems.
4. Managing water supply infrastructure to meet current and future demand.

The AGLG developed the following action plan template with respect to the first three audit objectives. It lists the recommendation of the AGLG, the steps taken by the Township to meet the objective as well as a target date to meet the objective:

AUDITOR GENERAL FOR LOCAL GOVERNMENT REPORT: SUMMARY OF RECOMMENDATIONS FOR OBJECTIVES 1-3			
Recommendations	Description	Steps Taken	Target Date
	<b>Audit Objective One:</b>	How the local government's governance structure and activities supported the provision of clean and safe drinking water where and when needed.	

AUDITOR GENERAL FOR LOCAL GOVERNMENT REPORT: SUMMARY OF RECOMMENDATIONS FOR OBJECTIVES 1-3			
Recommendations	Description	Steps Taken	Target Date
Recommendation One	Consider drinking water strategies that focus on sustainability, protecting water sources, explore rain water capture as a long term solution and assess land use applications that might impact groundwater sources.	The Township is currently developing a long term drinking water supply plan to supplement the many existing related programs, plans, studies and strategies related to water conservation, groundwater protection and sustainable water management planning. The Township is currently in discussion with Fraser Health regarding long term source water protection planning.	TBD
Recommendation Two	Consider a cost recovery approach to its water service planning that focuses on costs associated with water delivery to residents and long term capital planning.	The Township has established a water utility reserve fund to address replacement of aging infrastructure and will explore ways to further a full cost recovery approach building on existing practices.	Underway
Recommendation Three	Develop a formal framework for risk identification, mitigation and reporting that includes regular re-assessment and reporting of organizational risks with respect to drinking water.	The Township has established a water emergency response plan and commits to regular practice exercise. The Township will also consider conducting a risk hazard assessment related to the municipal water system as it has done with other areas of the services it provides.	TBD
Recommendation Four	Seek to improve data collection, analysis, monitoring and reporting on its water services as part of a continual improvement process.	Township staff currently reports to Council, and the general public on key aspects of its water system, including quantity and quality, with senior management staff fully engaged in the reporting and aware of any concerns. This information is reported annually in the water quality reports and is made available on the Township's website. Staff will examine opportunities for improvements	Ongoing

AUDITOR GENERAL FOR LOCAL GOVERNMENT REPORT: SUMMARY OF RECOMMENDATIONS FOR OBJECTIVES 1-3			
Recommendations	Description	Steps Taken	Target Date
		related to performance measures, monitoring and reporting.	
Recommendation Five	Improve its tracking and reporting on service requests and enquiries from the public relating to its water systems.	The Township is utilizing a new system for tracking and reporting on service requests. The Township will conduct an evaluation of this system on a regular basis to ensure it is meeting the needs of the municipality and its customers.	Ongoing
Recommendation Six	Improve the workflow of its water infrastructure work-order system to enhance its efficiency.	The Township has a tracking system that helps manage the workflow of the water infrastructure work-order system. The Township is currently exploring alternatives to the current system in order to improve efficiency.	Ongoing
Recommendation Seven	Retain a record of its management team meetings in order to track organizational decisions.	Water related departments not already doing so, have implemented recording team meeting minutes as of 2019. Records will be retained.	Ongoing
Recommendation Eight	Enhance its human resource policies by reviewing and updating its ethical policies and by developing a whistle blower policy.	The Township will continue to enhance HR policies, procedures and practices in keeping with the overall goals of the organization, applicable legislation and to ensure employee related issues are appropriately addressed.	Ongoing

AUDITOR GENERAL FOR LOCAL GOVERNMENT REPORT: SUMMARY OF RECOMMENDATIONS FOR OBJECTIVES 1-3			
Recommendations	Description	Steps Taken	Target Date
Recommendation Nine	Consider a more formal approach to measuring employee workplace engagement.	The Township will continue to evaluate opportunities for engagement through the involvement of employees in programs and initiatives as appropriate and applicable.	Ongoing
Recommendation Ten	Enhance its emergency and business continuity planning by ensuring its emergency plan is updated and tested regularly and completing business continuity planning for critical services,	The Township's water emergency response plan was recently completed. The plan will be updated periodically with regular practice to ensure relevant staff are versed and practiced.	Ongoing
	<b>Audit Objective Two:</b>	How the local government managed its drinking water supplies to meet current and expected future demand.	
Recommendation Eleven	Township should improve its water conservation and demand management efforts by developing a long term approach that focuses on residents' water use habits, water conservation, draught response, water supply shortages, water reuse application, bylaw compliance and a leak detection program.	The Township continues to utilize community based social marketing to identify barriers to water conservation and design programs to reduce overall and per capita water use. Water conservation programs continue to evolve and the water conservation bylaw is reviewed and revised regularly.	Ongoing
	<b>Audit Objective Three:</b>	How the local government ensured the safety and reliability of drinking water provided through its treatment and distribution systems.	
Recommendation Twelve	Continue to improve its water quality reporting processes by reviewing its annual water quality report and reporting changes in practice due to water quality issues.	The Township meets all Fraser Health reporting requirements and continues to endeavor to ensure accuracy and error free reporting. Staff will examine opportunities for improvements related to reporting.	Ongoing

With respect to objective # 4 the AGLG audited the East Langley Water Supply project. During this audit the AGLG noted the successes of the Township of Langley in delivering the project as well as gaps in the Township of Langley’s approach to managing water supply infrastructure. The Township has developed a Quality Management Manual (the manual). The manual addresses audit objective 4 recommendations 1, 3, 6, 7, 8, 12, and 14. The table below summarizes the list of recommendations with respect to objective #4:

AUDITOR GENERAL FOR LOCAL GOVERNMENT REPORT: SUMMARY OF RECOMMENDATIONS FOR OBJECTIVE 4			
Recommendations	Description	Steps Taken	Target Date
	<b>Audit Objective Four:</b>	How the Township of Langley is managing water supply infrastructure to meet current and future demand.	
Recommendation One	Develop and follow standards for project governance, defining when a project needs a project board, roles and responsibilities of the participants, guidelines related to stage gate review process, evaluate the project delivery method and meeting protocols.	The Township will look to further develop and expand on its ‘Capital Project Procedure’ document related to project governance especially for complex projects and projects over a certain size/threshold.	Covered under Section 2.3 of the manual
Recommendation Two	Develop a documented planning procedure to identify and assess the specific staff resources required for capital projects based on the scope and complexity of each project	Project teams are built based on specific project needs and internal resourcing. The Township will consider development of a formal planning procedure document for projects over a certain size/threshold.	TBD
Recommendation Three	Ensure project charters are complete and kept up-to-date throughout the project.	Project charters will be developed, monitored and kept current for projects, especially for projects of size and/or complexity exceeding a pre-determined threshold.	Covered under Section 2.3 of the manual

AUDITOR GENERAL FOR LOCAL GOVERNMENT REPORT: SUMMARY OF RECOMMENDATIONS FOR OBJECTIVE 4			
Recommendations	Description	Steps Taken	Target Date
Recommendation Four	Develop a project plan template as a tool for leading projects of high-value, high risk and/or public significance.	This is already being done on a case by case basis and through the Township's Capital Project Procedure' document; however, a standard template could be developed and utilized for projects exceeding a pre-determined threshold.	TBD
Recommendation Five	Broaden and formalize an approach to capital project risk management. This policy should be based on risk identification, risk assessment, monitoring of risks and ensuring project contingency is tied to risk management.	Risk management is currently considered on a project by project basis and contingencies are built into project budgets and schedules. Formal policies related to capital project risk management will be considered.	TBD
Recommendation Six	Develop guidance for how project scope is defined and how project scope change is authorized and implemented.	Project scope and scope change is managed internally via internally developed procedures and policy, and externally via contracts (typically MMCD contracts). The Township will look at developing and expanding internal procedure for projects of size and/or complexity that exceed a pre-determined threshold.	Covered under Section 2.3 of the manual
Recommendation Seven	Develop a policy and procedure that outlines the process for development, approval, management and reporting of budgets for capital projects that includes guidance on financial contingencies, budgets, and other financial control procedures.	A formal document to provide guidance on the process for development, approval, management and reporting of budgets will be considered along side a project plan template as per recommendation four.	Covered under Section 2.3 of the manual

AUDITOR GENERAL FOR LOCAL GOVERNMENT REPORT: SUMMARY OF RECOMMENDATIONS FOR OBJECTIVE 4			
Recommendations	Description	Steps Taken	Target Date
Recommendation Eight	Develop a baseline schedule at the time of project chartering, create a process of managing project schedules, and review progress reports against the baseline schedule	Project timing needs are varied and schedules are often dependant on multiple factors including budget approval, regulatory agency permitting, development needs, land requirement considerations, contractor availability and other factors outside of the Township control. Schedules are typically set via contract with construction contractors and managed according to the terms of the contract	Covered under Section 2.3 of the manual
Recommendation Nine	Review and update its procurement policy to align with evolving procurement practices and relevant trade agreements.	A regular review and update of the Township's procurement policy to be undertaken.	2020
Recommendation Ten	Township of Langley's purchasing department should monitor its procurement activities and ensure they are well documented and comply with its purchasing policies and procedures.	Monitoring of the Township's procurement activities to ensure they are well documented and comply with its purchasing policies and procedures is an ongoing effort.	Ongoing
Recommendation Eleven	Develop and implement a policy and related processes and tools to formally and systematically evaluate vendor performance.	The Township will explore the development and implementation of a policy and related processes and tools to formally and systematically evaluate vendor performance.	TBD

AUDITOR GENERAL FOR LOCAL GOVERNMENT REPORT: SUMMARY OF RECOMMENDATIONS FOR OBJECTIVE 4			
Recommendations	Description	Steps Taken	Target Date
Recommendation Twelve	Define reporting requirements for capital projects to ensure that those accountable for the performance of a project receive regular and consistent status updates.	Internal reporting to project sponsors, etc. occurs regularly with frequency depending on project size and complexity. A formal document to provide guidance on reporting will be considered along side a project plan template as per recommendation four.	Covered under Section 2.3 of the manual
Recommendation Thirteen	Develop a stakeholder engagement plan and procedures for its capital projects.	Stakeholder engagement is currently considered on a project by project basis and is dependant on potential impacts to stakeholders. A formal plan and procedures document could be considered for projects meeting pre-determined thresholds.	Ongoing and TBD
Recommendation Fourteen	Develop a project close-out procedure and related checklist	Review and improvements to the Township's 'Capital Projects Procedures' document will be considered in conjunction with checklist.	Covered under Section 2.4 of the manual
Recommendation Fifteen	Further develop its asset management practices for water infrastructure.	Asset management is a continuous process at the Township of Langley. The Township is developing the water asset management program by updating the water asset management plan and integrating it along with the Asset Management Policy and the Water Master Plan. The Township is also integrating its Risk and Criticality model with current data on waterman breaks and the leak detection program.	TBD

AUDITOR GENERAL FOR LOCAL GOVERNMENT REPORT: SUMMARY OF RECOMMENDATIONS FOR OBJECTIVE 4			
Recommendations	Description	Steps Taken	Target Date
Recommendation Sixteen	Improve its tracking of infrastructure maintenance, renewal and replacement activities by internally reporting on the status of work orders relative to its maintenance schedule.	The Township is reviewing the current level of service and work management practices including a review of current workflows and the current procedures for collecting and reporting on work related data as part of its continuous improvement process. This review would include establishing KPIs for both work management processes and the major asset systems.	Underway

The Township will take into account all of the remaining AGLG recommendations and develop a plan of action to improve its governance structure and practices to support the provision of clean and safe drinking water to its residents, meet current and future water supply demands, ensure the safety and reliability of drinking water sources and manage water supply infrastructure projects to meet future water demands.

## 2.8 Operational Highlights for 2020

The Township achieved the following operational milestones:

- Installed and commissioned PRV at Tall Timber
- Shut down and disconnected Tall Timber Reservoir and pumps from distribution system
- Designed a pump and pipe network to provide Metro Vancouver water via the Brawn Pump Station to residents in Upper Murrayville area
- Designed a new Jericho Booster Pump Station to utilize the Metro Vancouver Jericho Reservoir that is under construction
- Installed and commissioned Fort Langley Well #2 contact chamber to improve chlorine CT values
- Designed Fort Langley Well #2 pH adjustment for water quality improvements
- Increased number of microbiology water sampling submissions to Metro Vancouver Lab
- Cleaned West Aldergrove reservoir with diving contractor
- Cleaned Highpoint reservoir cell #2
- Completed water station condition assessments with consultant
- Connected the ELWS to the new outlet pipe from the Metro Vancouver Jericho Reservoir

- Removed Murrayville Reservoir from the system and drained due to structural concerns

## 2.9 Planned Works for 2021

The Township plans to achieve the following works:

- Decommission and dispose of the station and reservoir at Tall Timber including closure of 3 wells
- Swab the Tall Timber water system after PRV commissioning
- Install pipe network for distribution of Metro Vancouver water via the Brawn Pump Station to residents in Upper Murrayville area
- Implement iron and manganese treatment option for Brookwood and Murrayville wells
- Install new water main on Mary Avenue to help improve fire protection
- Install chlorination system and jockey pump at Brawn Booster Station for water quality improvements
- Decommission Fort Langley Well #1 and Willoughby Well #1.
- Clean East Aldergrove reservoir with diving contractor
- Clean cell #1 at Highpoint reservoir
- Replace filters at AWTP
- Installation of pH adjustment system at Fort Langley well #2
- Construct a booster pump station in Fernridge to provide water service to new development east of 208 Street, between 32 Avenue and 28 Avenue
- Assist with the completion of the Metro Vancouver Jericho Reservoir
- Design of a new water main on 28 Avenue, between 196 Street and 202 Street
- Design of a new trunk water main on 56 Avenue, between 250 Street and Gloucester Way. This is the next phase of the ELWS project, to increase capacity into Gloucester from the end of previous construction
- Design and construct a new water main on 60 Avenue, between 264 Street and 266 Street, to connect two dead-end water mains
- Design PRV's at 83 Avenue and 200 Street and at 86 Avenue and 202 Street to reduce pressure in the Carvolth Neighbourhood development area and connect to the Walnut Grove pressure zone, and a zone valve to measure flows under Highway 1 at 202 Street

### 3.0 WATER SAMPLING AND TESTING PROGRAM

The Township follows a routine BC DWPR water sampling and testing program in order to maintain the delivery of safe, high quality drinking water to its residents. EOCP certified Water Distribution Operators take samples and test water at local supply sources and various points throughout the water distribution system. Weekly water samples are tested at ALS Environmental and GVWD Labs which are Canadian Association for Laboratory Accreditation (CALA) certified labs for routine physical and microbiological parameters; and quarterly, summer and winter for microbial parameters, chemical and/or physical parameters. The GVWD also samples water prior to it entering the Township’s distribution system.

The BC DWPR below outlines the minimum number of water samples based on the Township’s serviced population of 117,810. Based on Schedule B of the regulation, the Township’s monthly sampling of 112 exceeds the required 93.

Table 3.0.1 Drinking Water Protection Regulations: Schedule A

<b>Schedule A</b>	
Water Quality Standards for Potable Water	
<b>Parameter:</b>	<b>Standard:</b>
Fecal coliform bacteria	No detectable fecal coliform bacteria per 100 ml
Escherichia coli	No detectable Escherichia coli per 100 ml
Total coliform bacteria:	
(a) 1 sample in a 30 day period	No detectable total coliform bacteria per 100 ml
(b) more than 1 sample in a 30 day period	At least 90% of samples have no detectable total coliform bacteria per 100 ml and no sample has more than 10 total coliform bacteria per 100 ml

Table 3.0.2 Drinking Water Protection Regulations: Schedule B

<b>SCHEDULE B</b>	
Frequency of Monitoring Samples for Prescribed Water Supply Systems	
<b>Population Served by the Prescribed Water Supply System:</b>	<b>Number of Samples Per Month:</b>
less than 5,000	4
5,000 to 90,000	1 per 1,000 of population
more than 90,000	90 plus 1 per 10,000 of population in excess of 90,000

Water sampling, as described in [Table 3.0.3](#), and [Table 5.0.1](#) met regulatory requirements as set by the GCDWQ and the Water Quality Monitoring and Reporting Plan (WQMRP) (September 2008) for municipalities in the GVWD. There was one indication of positive coliforms in the groundwater wells and 11 samples in the distribution system indicating the presence of total coliform. A further breakdown of the events is provided in [Section 5.2](#).

Of the 28 sampling locations, 17 weekly samples are sent to a CALA Lab and 11 samples are tested by GVWD. The weekly samples are tested for the following chemical, physical and microbiological parameters;

- colour
- pH
- turbidity
- free chlorine
- temperature
- conductivity
- HPC
- total coliforms and
- E.coli.



Sampling Station

The GCDWQ promotes *‘the use of a multi-barrier approach that includes source water protection, adequate treatment, including disinfection, and a well maintained distribution system can reduce microorganisms to levels that have not been associated with illness, as well as meet the guidelines...’*

Table 3.0.3 Water Sampling and Testing Schedule

Water Type	Parameter	Frequency
Township Source Water	E.coli, Total Coliforms, HPC	Quarterly
	Alkalinity, Colour, Chloride, Fluoride, Hardness, Nitrite, Nitrate, pH, Sulfate, Turbidity	Summer/Winter
	Aluminum, Antimony, Arsenic, Barium, Boron, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Potassium, Silicon, Sodium, Uranium, Zinc	
	Nitritotriacetic Acid (NTA)	Summer/Winter
	BTEXs, MCPA, PAHs, Phenols, VOCs	
	Ammonia, Chlorate, Cyanide, Dissolved Organic Carbon, Sulphide, Total Dissolved Solids, Total Organic Carbon	
	Beryllium, Bismuth, Cobalt, Mercury, Molybdenum, Nickel, Phosphorous, Selenium, Silver, Strontium, Sulphur, Thallium, Tin, Titanium, Vanadium, Zirconium	
	Pesticide and Herbicide Scan, Radionuclides	Summer
Township Distribution System	Aluminum, Antimony, Arsenic, Barium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Zinc	Summer/Winter at five locations
	E.coli, Total Coliforms, HPC	Weekly
	Free Chlorine	
	Turbidity	
	pH, Temperature, Conductivity	Quarterly at selected sites by GVWD and by TOL quarterly at five locations
THM, HAAs, pH, Vinyl Chloride, TOC, Conductivity		

### 3.1 GCDWQ Updates

Health Canada publishes the GCDWQ on behalf of the Federal-Provincial-Territorial Committee on Drinking Water (CDW). Guidelines are systematically reviewed to assess the need for updates; several chemical, physical and microbiological parameters are new or have been revised since the publication of the Sixth Edition of the Guidelines for GCDWQ in 1996. This report references Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment, September 2020, which supersedes the GCDWQ, 6th edition.

In 2019, Health Canada updated its health-based MAC guideline for copper to 2 mg/L. Short term exposure to copper may result in gastrointestinal tract issues and long-term issues may

result in liver and kidney effects. Copper is naturally occurring in water but a big component of high copper levels in water is due to copper pipes. All the township source samples were below both the copper MAC and AO guidelines.

The MAC guideline for lead was updated to 0.005 mg/L (ALARA). High levels of lead in water can lead to reduced IQ levels. Health Canada has prescribed that this guideline should be kept as low as possible as there are no known safe levels of lead exposure. A large contributor of high lead level is due to lead service lines, lead solder, and brass fittings. All the Township source samples were below the lead MAC guidelines.

The MAC guideline was established for manganese at 0.12 mg/L. The AO guideline for manganese was updated to 0.02 mg/L. Manganese is naturally occurring in water and at higher levels can lead to discoloration of water and staining of laundry. The current MAC guideline of 0.12 mg/L and AO of 0.02 mg/L was exceeded in Acadia, Aldergrove, Brookwood, Murrayville and Tall Timber wells. Council have directed staff to proceed with design work of localized water treatment plants to bring the parameters into compliance.

A MAC guideline was also established for strontium of 7 mg/L. Strontium is also naturally occurring in water due to erosion and weathering of rocks. Strontium may lead to bone defects. All the Township source samples were below the lead MAC guidelines.

The MAC guideline for Barium was updated to 2.0 mg/L. Barium is naturally occurring but can also releases from industrial uses. High levels of barium can lead to kidney effects. All the Township source samples were below the lead MAC guidelines.

The MAC guideline for Cadmium was updated to 0.007 mg/L. The contribution of cadmium in drinking water is generally from the galvanized steel used in pipes and well components. High levels of cadmium can lead to kidney damage and decreased bone density. All the Township source samples were below the lead MAC guidelines.

### 3.2 Fraser Health Updates

Fraser Health requests that the following message be included in the 2020 Annual Water Quality Report:

*Anytime the water in a particular faucet has not been used for six hours or longer, "flush" your cold-water pipes by running the water until you notice a change in temperature. (This could take as little as five to thirty seconds if there has been recent heavy water use such as showering or toilet flushing. Otherwise, it could take two minutes or longer.) The more time water has been sitting in your home's pipes, the more lead it may contain.*

*Use only water from the cold-tap for drinking, cooking, and especially making baby formula. Hot water is likely to contain higher levels of lead.*

*The two actions recommended above are very important to the health of your family. They will probably be effective in reducing lead levels because most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.*

*Conserving water is still important. Rather than just running the water down the drain you could use the water for things such as watering your plants.*

## 4.0 SOURCE WATER QUALITY

Source water quality is an important indicator of the level of treatment required to produce a water supply that is safe for consumption and aesthetically pleasing. The source water quality monitoring program ensures that source water quality remains high and it provides analytical data required by the GCDWQ for ongoing confirmation of water quality.

As detailed in [Table 3.0.3](#), the Township's source water is sampled on a quarterly basis for microbial parameters, semi-annually for routine parameters, and annually for complex parameters. Source samples were collected from wellheads in March, June, August/September, and December of 2020 for microbial testing. Each sample collected in August/September (summer) and December (winter) was additionally analyzed for routine parameters; the August samples were also analyzed for complex parameters.

The 2020 source water sampling program is detailed in [sub-sections 4.1, 4.2 and 4.3](#). The MAC represent health related guidelines. AO apply to certain substances that may affect acceptance by consumers but are not a direct health concern. As low as reasonably achievable (ALARA) is MAC within reason. ALARA is used as a guideline in parameters such as Arsenic, Lead, and Disinfection Byproducts.

It should also be noted that where the Aldergrove well tests were outside of acceptable limits, these sources were treated and blended at the Aldergrove Water Treatment Plant with the approval of Fraser Health until the desired MAC or AO was achieved. For details on the water quality coming out of the treatment plant, see sample site AD AWTP in the charts.

### 4.1 Quarterly Microbial Testing

Quarterly microbial testing sets out to sample for E. coli and total coliform bacteria.

From the GCDWQ:

*“Total coliforms are naturally found in both fecal and non-fecal environments, so they are commonly present in both surface water and groundwater under the direct influence of surface water sources. Consequently, monitoring total coliforms in these sources does not provide information on the quality of the source water from the perspective of health risk. Protected groundwater systems, on the other hand, should not contain total coliforms. As their presence indicates that the groundwater may be vulnerable to contamination from the surrounding environment, detection of total coliforms in the water leaving the well should trigger further actions... This MAC does not apply to distribution systems, where total coliforms are used to indicate changes in water quality... In municipal-scale systems, the detection of more than 10% of samples in a given sampling period, or of consecutive samples from the same site, that are positive for total coliforms indicates changes in the quality of the water and a need for follow-up actions to be initiated.”*

Total coliforms are an important indicator of the degree of contamination, low flow/stagnant water, and the treatment required to ensure a safe, potable water supply. [Table 3.0.1](#) outlines

Schedule A of the BC DWPR, which provides quality standards for potable water. For the Township water supply points which originate from wells, quarterly microbiological testing has been carried out. If problems were to develop, it is expected that they would appear in the distribution system's weekly testing (see section 5.0). Additionally, Brookwood Wells 7, 9 and 10, Fort Langley Well 2, Acadia Booster Station, Murrayville Reservoir, and Tall Timber Booster Station are treated using sodium hypochlorite.

Table C.1 in the Appendix lists results for the 2020 quarterly microbiological analysis of the source water for total coliforms and E.coli.

The December quarterly microbial testing coincides with the Winter Annual source sampling. An additional fifth set of microbial samples were taken as routine with the summer annual sampling.

## 4.2 Semi-Annual Routine Parameter Testing

Source water sampling for routine parameters provides the Township with valuable information on water quality and enables Water Operators to plan treatment options based on historical trends. Parameters highlighted in this section have either exceeded the GCDWQ for MAC or AO or they are discussed for public information. Presented in *Appendix A: Source Water Test Results* are parameters that have health-based or aesthetic guidelines for chemical and physical parameters in the GCDWQ. For common parameters of interest, see further details in *Appendix B: Raw Data*

### 4.2.1 Manganese

Manganese is naturally occurring in the environment and normally arises due to erosion and weathering of rocks and minerals. MAC parameters are based on high manganese levels effecting neurological development and deficits leading to memory problems, attention and motor skills issues. AO concerns are due to high levels staining laundry and plumbing fixtures. Manganese releases with Iron during certain pH conditions.

The current MAC guideline of 0.12 mg/L was exceeded in Acadia well #2, Aldergrove well #4, Aldergrove well #6, Aldergrove well #7, Aldergrove well #8, Brookwood well #7, Brookwood well #9, and Brookwood well #10. In addition, the AO guideline of 0.02 mg/L was also exceeded in Murrayville well #1, Murrayville well #2, Tall Timber well #1, Tall Timber well #2, and Tall Timber well #3.

The levels in Aldergrove wells were reduced to acceptable levels during the treatment process at the AWTP prior to distribution. The Township conducts weekly tests at its Distribution sample stations to mitigate the effects of high manganese levels. No action taken to counteract the high levels in the Acadia as future plans include a connection to the East Langley system and decommissioning of the wells. The Tall Timber system was connected to ELWS and the wells are no longer in operation. Brookwood and Murrayville wells were turned off in 2019 due to the aesthetic water issues caused by manganese. Township of Langley staff have conducted a study, which recommended new localized water treatment plants to treat the wells in order to bring the manganese and iron parameters within compliance. Following the recent approval by Council on May 31, 2021, staff will be proceeding with detailed design work.

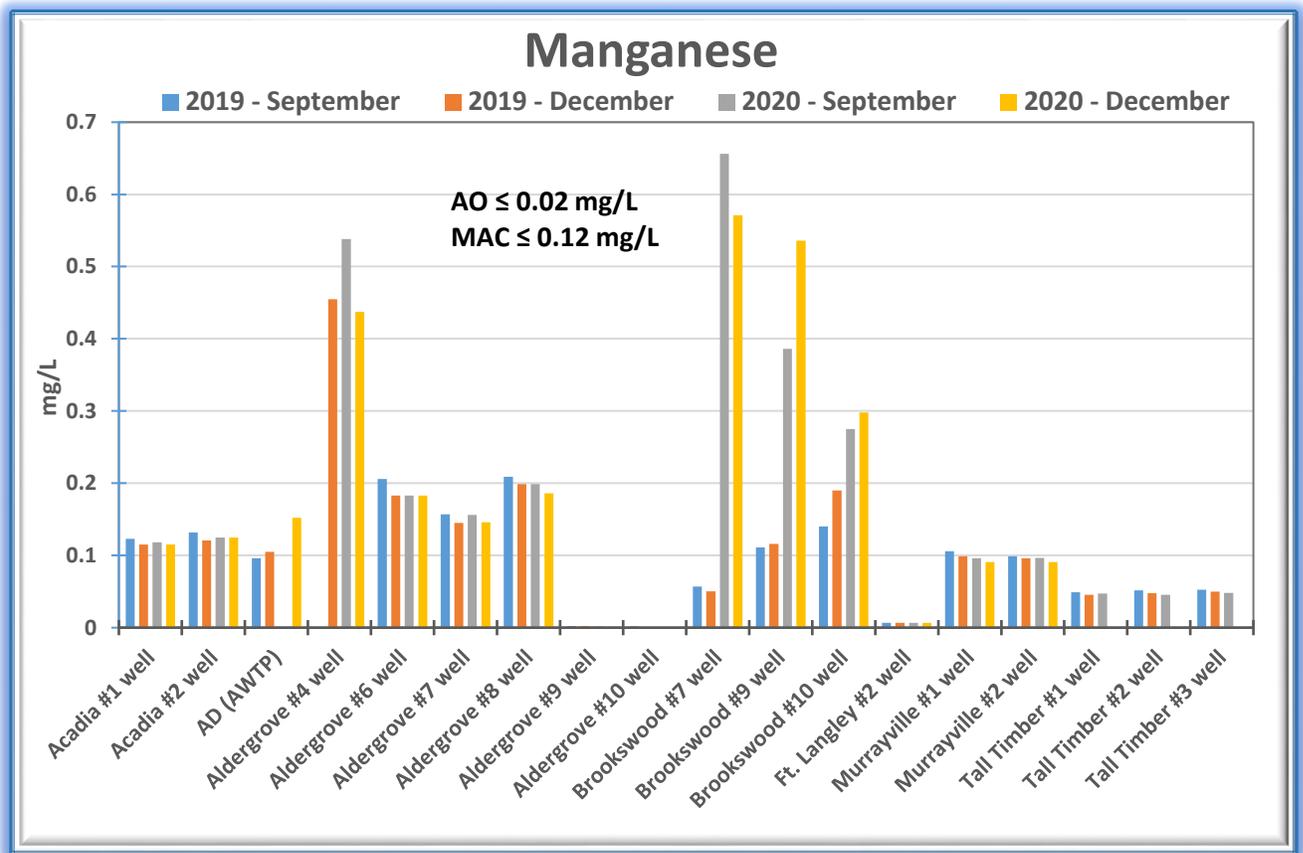


Figure 4.2.1 Manganese

Due to the Brookwood well shutdown a sharp increase in manganese levels was noticed in the Brookwood wells. This could be due to a combination of factors including anoxic conditions formed over time due to wells not pumping, or manganese settling in and around the pump and metal casing resulting in higher concentrations when the samples were taken. It should be noted that the water from Brookwood and Murrayville wells was not conveyed into the distribution system but was flushed to waste instead.

#### 4.2.2 Nitrate as Nitrogen

At Aldergrove Well 10 Nitrate was above the MAC level of 10 mg/L. With the approval of Fraser Health, prior to distribution, the Township blends high and low nitrate content water at the AWTP. The blending results in an acceptable nitrate level of less than 10 mg/L, measured weekly at sample stations to ensure treated water meets regulatory compliance.

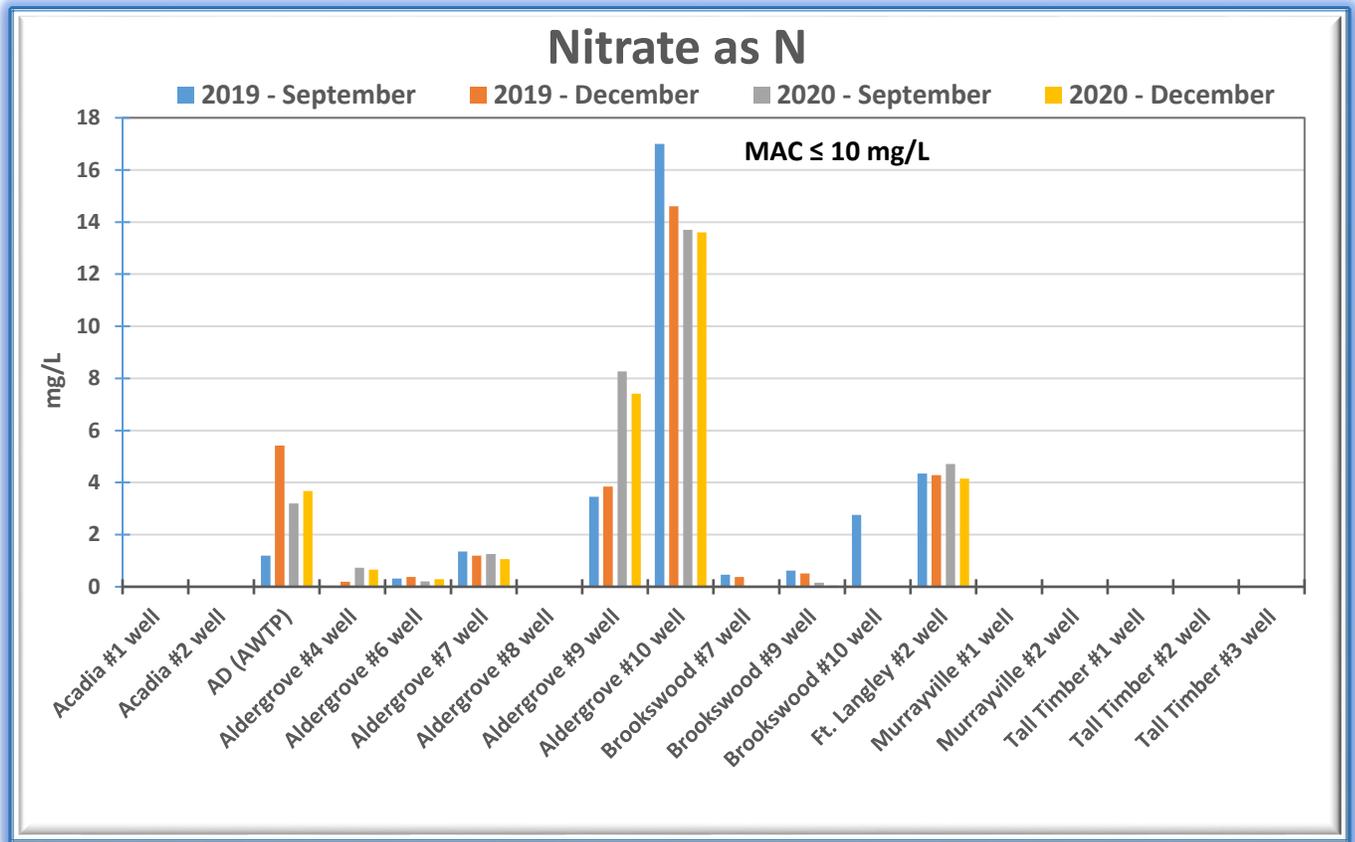


Figure 4.2.2 Nitrate as N

### 4.2.3 pH

pH is a measure of acidity/basicity of water. pH does not have a MAC or AO guideline instead Health Canada recommends an operational guideline of 7.0 – 10.5. pH within the operational guideline maximizes water treatment effectiveness, controls corrosion and reduces leaching from distribution system and plumbing. As mentioned previously, Aldergrove sources are blended at the Aldergrove Water Treatment Plant prior to distribution, which raises low pH levels. (See AD AWTP for treatment plant results).

The pH of Fort Langley well #2 is not within the operational guideline. Township staff are currently conducting detailed design of a pH adjustment facility at Fort Langley well #2 that will use Sodium Hydroxide to raise the pH levels to within the operational guideline.

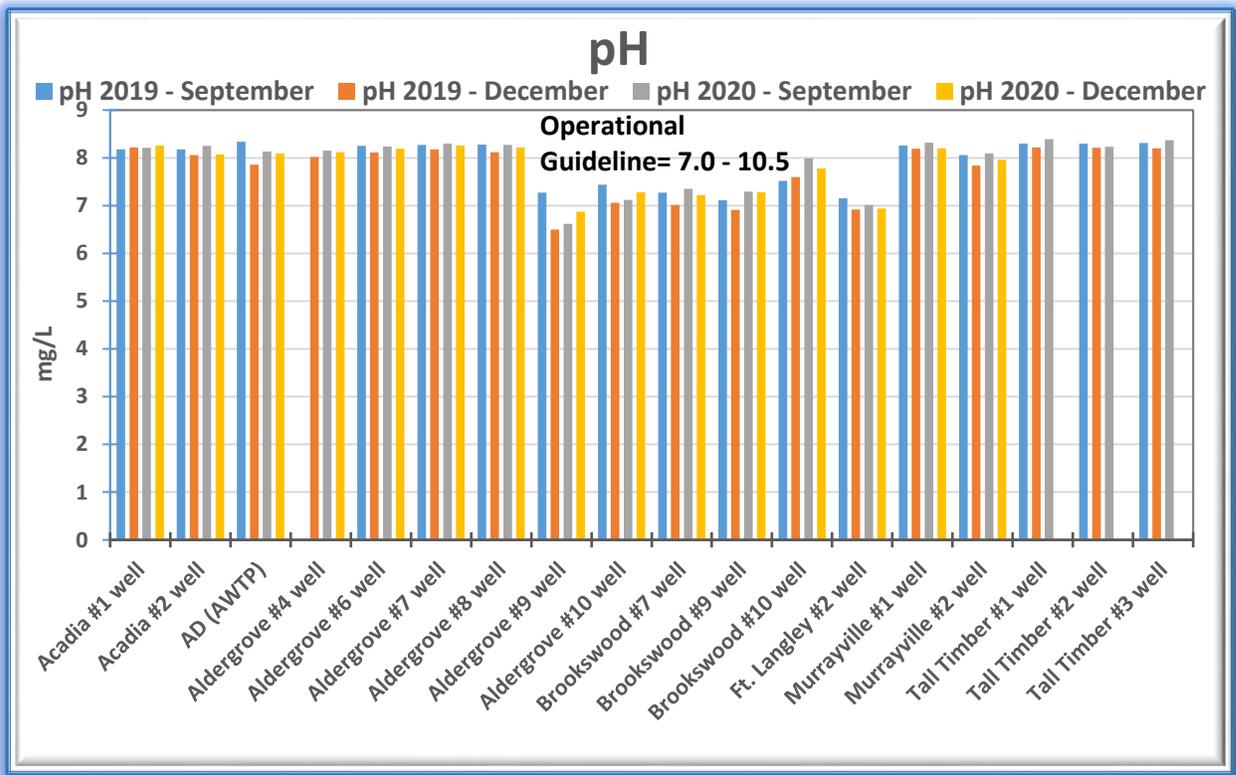


Figure 4.2.3 pH

As a part of its Corrosion Control Program: Copper Pipes Protection initiative Metro Vancouver is increasing the pH of its finished water from 7.7 to 8.3-8.5. Metro Vancouver will be using natural minerals to achieve the higher pH which will:

- Reduce the release of copper from pipes in buildings caused by low pH in the region's water
- Reduce leaks in pipes caused by copper corrosion
- Help preserve the lifespan of pipes and hot water tanks, and
- Reduce green stains on tubs, sinks, and grout

Older buildings and homes can have plumbing and fittings that have brass components that contain copper. This change might prompt some water users such as health care facilities and breweries to adjust and calibrate their operations to the change in pH.

#### 4.2.4 Turbidity

Turbidity above the MAC of 1NTU was exceeded in Acadia, Aldergrove, Brookwood, Murrayville, and Tall Timber wells. The water from Aldergrove wells is filtered at the AWTP to ensure that turbidity levels are lowered. The wells in Brookwood and Murrayville have been taken out of production. Township of Langley staff have conducted a study, which recommended new localized water treatment plants to bring the parameters within compliance. Following the recent approval by Council on May 31, 2021, staff will be proceeding with detailed design work. Tall Timber wells have been taken out of production and the system is connected to the ELWS. No action was taken to counteract the turbidity levels in the Acadia wells.

It should also be noted that minerals present in the water and holding time can reflect negatively on the turbidity results. The Ground Water at Risk of Containing Pathogen (GARP) study in [section 4.5](#) has indicated that higher level of turbidity can lead to increased risk of groundwater containing pathogens.

The GCDWQ states: “To ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that water entering the distribution system have turbidity levels of 1.0 NTU or less. For systems that use groundwater, turbidity should generally be below 1.0 NTU.”

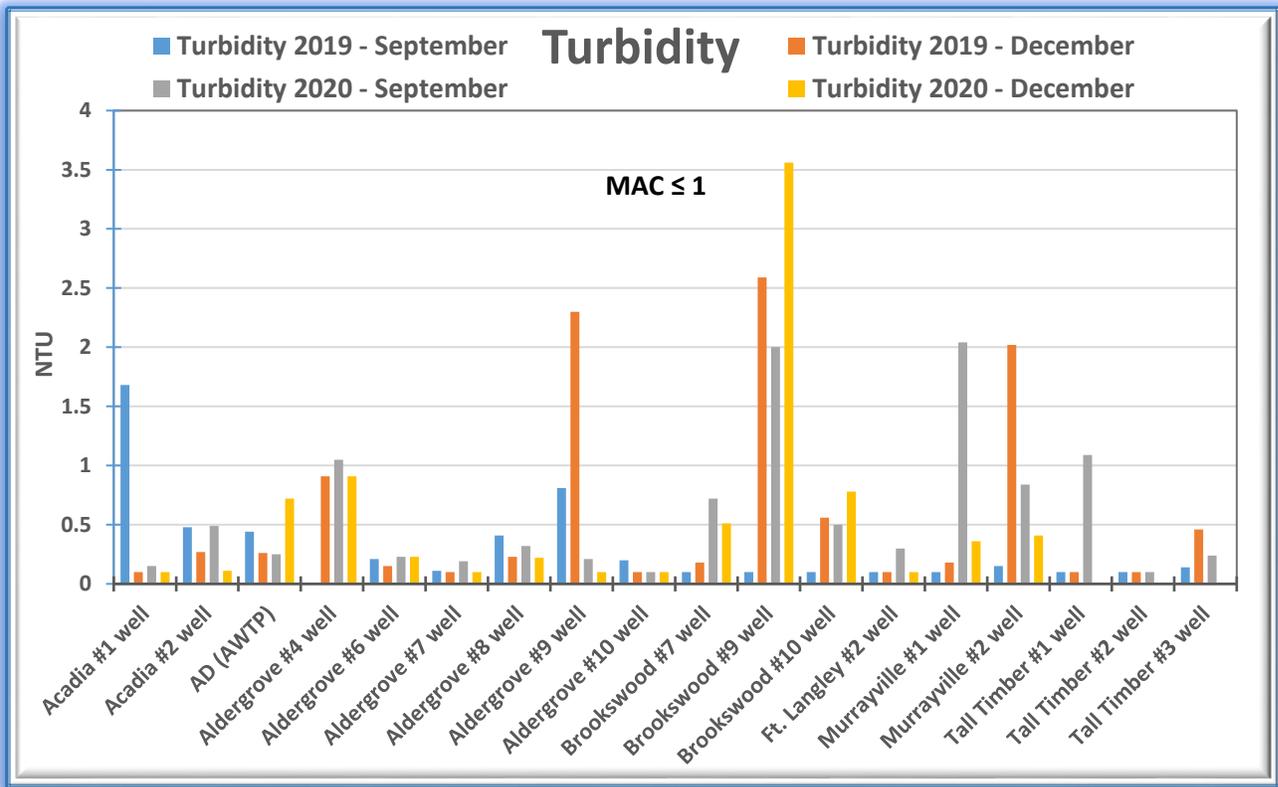


Figure 4.2.4 Turbidity

**4.2.5 Iron**

The AO for Iron was exceeded at Brookwood well 7 and Brookwood well 9 was exceeded. The wells in Brookwood were not in production during 2020. The proposed localized water treatment plants will bring the iron AO into compliance.

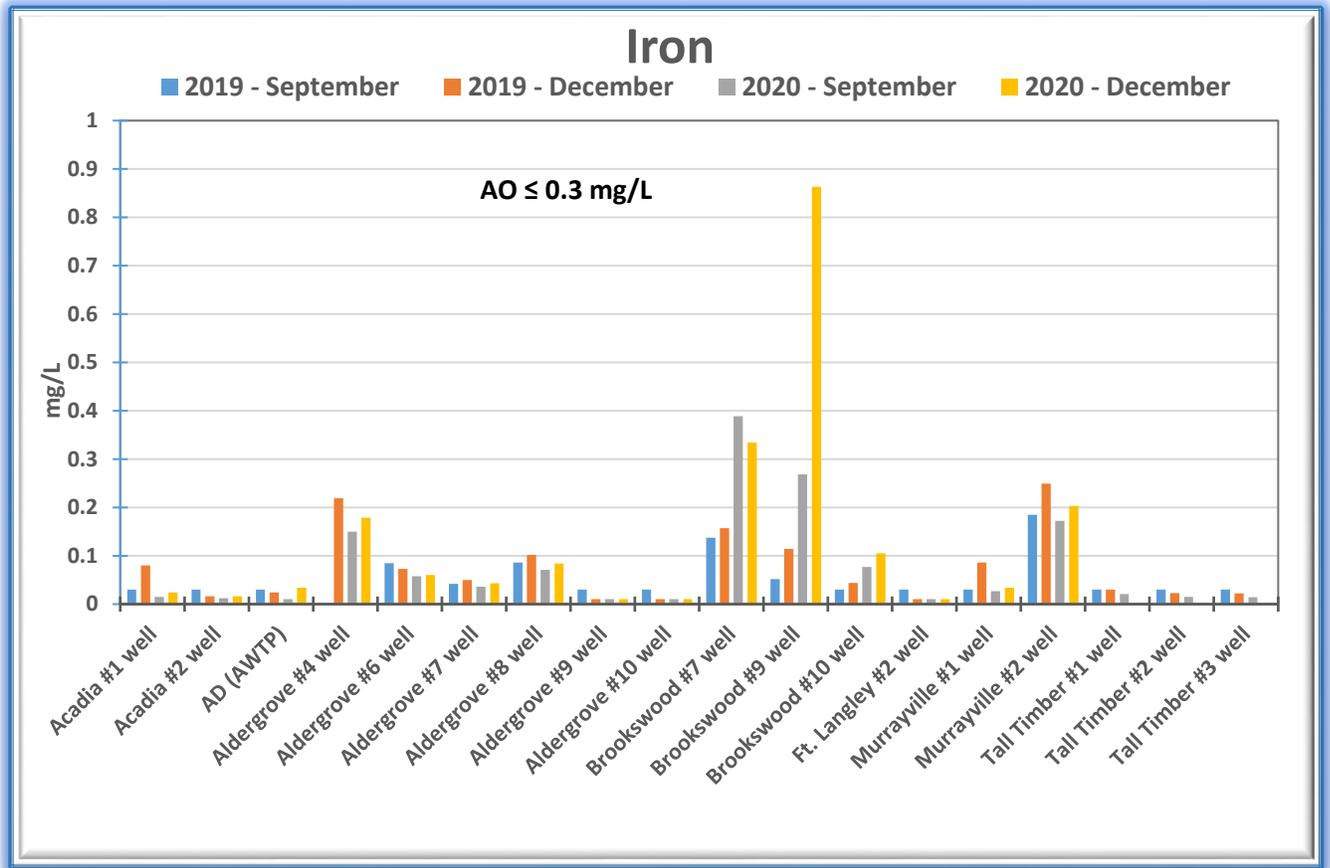


Figure 4.2.5 Iron

#### 4.2.6 Lead

In November of 2019, Global News published an article citing concerns over the lead concentrations in municipal water systems throughout Canada. Township staff prepared a memo to Council dated November 6, 2019 with information regarding the semi-annual testing of lead within the municipal water system.

As per the Global News article, “While the water generally contains no lead when it leaves municipal treatment plants, the main sources of the contamination are lead service lines”. As per Township records, there are no lead water mains or water connections in the Township system. However, it should be noted that there may be the possibility that some of the connections installed before 1986 may contain some lead. The installation of lead water service lines occurred in Canada until 1975 and lead soldering was used in plumbing repairs until 1986.

Health Canada has set the MAC associated with health concerns at 0.005 mg/L for lead. Health Canada also recognizes that the majority of lead concentration is due to plumbing, leaching lead service lines, and lead solder. During the 2020 semi-annual chemical and physical parameter testing, all the distribution and source samples in the Township were below the MAC of 0.005 mg/L.

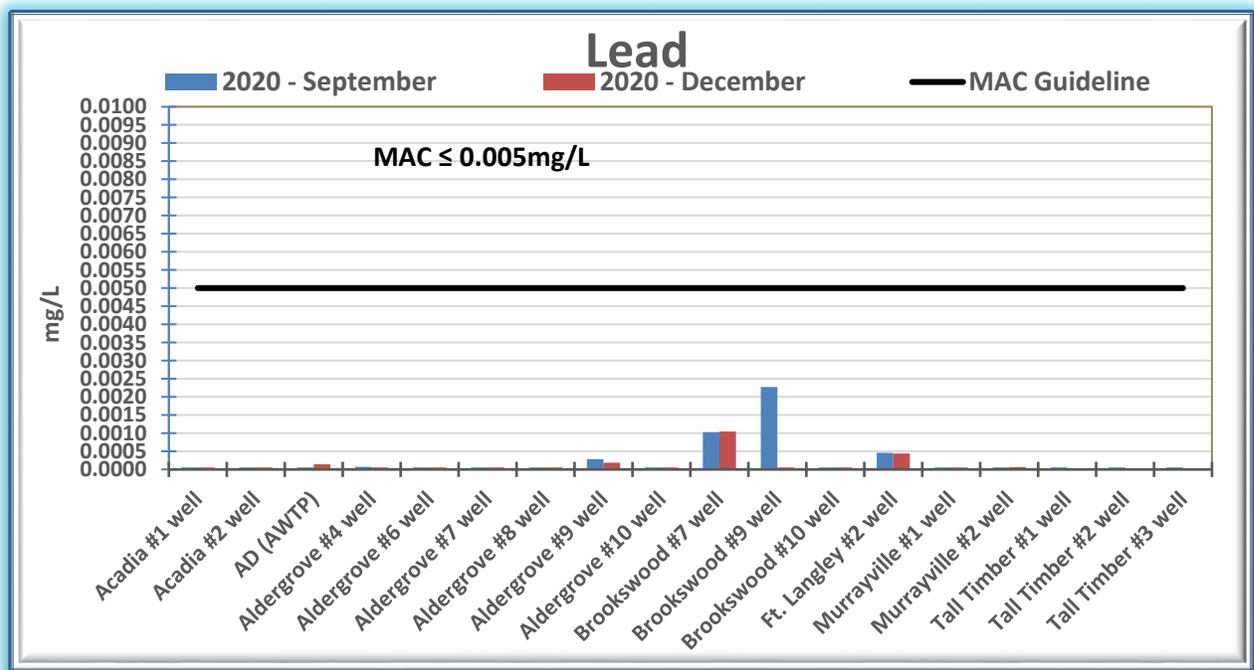


Figure 4.2.6 Lead

All the source samples tested in 2020 tested below the MAC guideline for lead.

### 4.3 Annual Complex Parameter Testing

Source water sampling for complex parameters complies with the GCDWQ and provides the Township with information on water quality for a given well. All annually tested parameters (refer to [Table 3.0.3](#)) in 2020 were within acceptable limits of the GCDWQ.

### 4.4 Source Water Protection

A Water Demand Management Strategy to assist with long term management of municipal water supplies was completed in 2007. Since completing this strategy, Township staff has been working to implement its recommendations. The Township also completed work with the Province to develop a water management plan in 2009, which aims to provide safe and sustainable groundwater for our community. Implementation of recommendations from the Water Management Plan has included a contaminant inventory of potential threats to municipal well capture zones, and a pesticide awareness campaign. The Water Wise program has been in place for nearly 15 years and continues to provide education and incentives to the public to protect groundwater from contamination and to conserve water.

As of February 2016, the Water Sustainability Act came into force. This Act replaced the Water Act and ensures a commitment to secure and healthy water for current and future generations by protecting water flows for ecosystems and fish and including requirements for groundwater use and licensing, well construction and maintenance, dam safety, and compliance.

### 4.5 GARP – Hazard Screening and Preliminary Assessment of Potential Groundwater at Risk of Containing Pathogens

The Township has conducted a preliminary study with an engineering consultant to determine wells that may be at risk of containing pathogens. The preliminary GARP assessment was done in accordance with the procedure outlined in the BC Ministry of Health (BC MoH) “Guidance Document for Determining Ground Water at Risk of Containing Pathogens.” The consultant provided a list of recommendations to support development and implementation of a strategy to manage the potential risk of pathogens to the Township wells. These recommendations are listed below:

- Determine if the contact time from when chlorine is injected into the groundwater supply to when it reaches the first resident is sufficient to neutralize bacteria and to review potential options if the contact time is not sufficient as outlined in the BC MoH Drinking Water Treatment Objectives.
- Compare the reported detection of total coliform bacteria with the operational records to confirm if the results reflect normal operating conditions. If results identify samples that are not representative of operating conditions the results of the GARP study should be revisited.
- Turbidity should also be monitored when source samples are collected for microbiological analyses. The results should be reviewed to determine if there is any correlation between high turbidity levels and microbiological levels.
- Cross contamination prevention procedures should be monitored and reviewed and if possible expanded to control the potential of cross-contamination of samples.

- A formal well protection plan (WPP) should be developed for the Township's production wells and the WPP should be prioritized for wells that are at a higher risk of being GARP.

In the preliminary GARP assessment Fort Langley well #2 was recognized as groundwater at risk of containing pathogens. The well was monitored and sampled weekly for bacteriological analysis and alkalinity. The results of the bacteriological samples can be found in Appendix B [Table B.1](#). All of the bacteriological samples for Fort Langley well #2 tested negative for Total Coliform and E.coli.

The Township is taking steps to bring its wells into compliance with GARP regulations based on the recommendations of the consultant.

## 5.0 DISTRIBUTION SYSTEM WATER QUALITY

Water in the Township of Langley’s distribution system is tested weekly as outlined in [Table 3.0.3](#). A map of the weekly sampling sites and list of the map labels by location can be seen in [Table 5.0.1](#) and [Figure 5.0.1](#), respectively. Distribution system microbial and physical parameter results are highlighted in Appendix B.

Table 5.0.1 Weekly Water Distribution Test Site Addresses

Map Label	Location	Map Label	Location
AA	7950 202A St	J	3781 204A St
AB	5679 211 St	K	19966 44 Ave
AC	2340 204A St	L	6350 197 St
AD	AWTP	M	9844 199A St
AJ	19620 3A Ave	N	22870 96 Ave
AK	22930 48 Ave	O	21575 Crush Cr
AL	Murrayville Reservoir	P	26342 58 Ave
AM	23752 52 Ave	R	26829 60 Ave
C	21484 51B Ave	S	4649 242A St
D	7175 230 St	T	9163 213 St
E	23740 60 Ave	U	7025 208 St
F	24919 57 Ave	V	22020 49 Ave
G	3133 262 St	W	4257 209 St
H	23000 Rawlison Cr	X	21584 78 Ave
I	21736 100 Ave	Y	26736 33 Ave

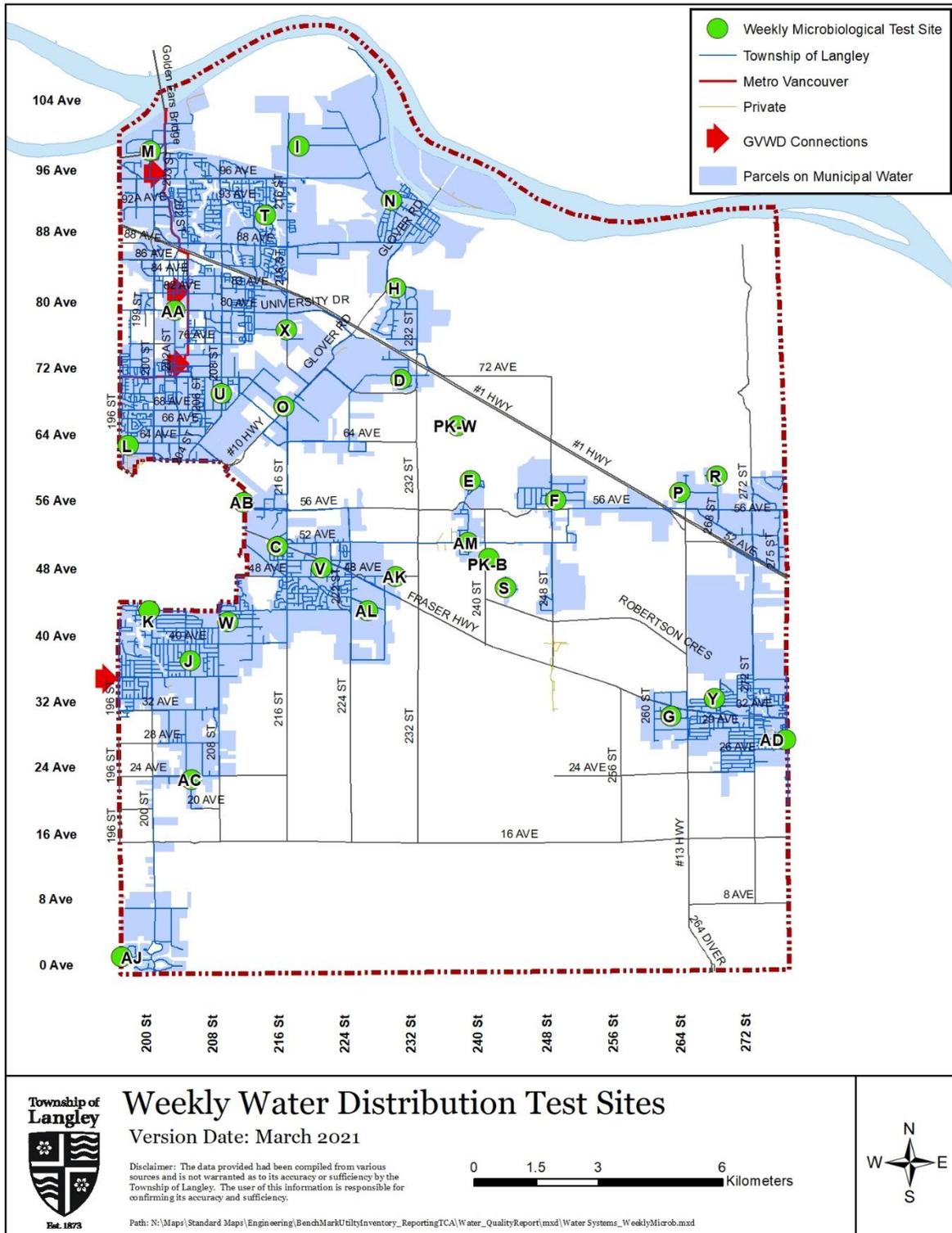


Figure 5.0.1 Weekly Water Distribution Sample Sites

### 5.1 Distribution System Microbial Testing

Total coliforms and E.coli testing indicate the effectiveness of system disinfection and ensures that the water supply system meets the microbial guidelines. HPCs are naturally occurring and their presence in drinking water is not indicative of a public health risk. No MAC is specified for HPC bacteria in drinking water but increases in HPC concentration above site baseline levels are considered undesirable.

As previously mentioned in section 3.0, [Table 3.0.2](#): BC DWPR provides microbial water quality standards for potable water which aligns with Health Canada guidelines for water sampling frequency of microbiological contaminants.

For a population of approximately 117,810 being served by Township water supplies, the required number of samples should be on the order of 93 per month. Currently the Township exceeds the requirement by testing an average of 112 samples per month in order to address low flow areas and community growth.

### 5.2 Microbial Results for 2020

As an extra water quality indicator, the Township collects weekly Heterotrophic bacteria samples to monitor the general bacteriological water quality in the distribution system. Although the GCDWQ state that “HPC results are not an indicator of water quality and should not be used as an indicator of potential adverse human health effects”, the sampling site tests results which detected high or increased HPC were monitored and/or flushed and resampled.

Distribution water system sample for E.coli and Total Coliform are collected and analyzed weekly.

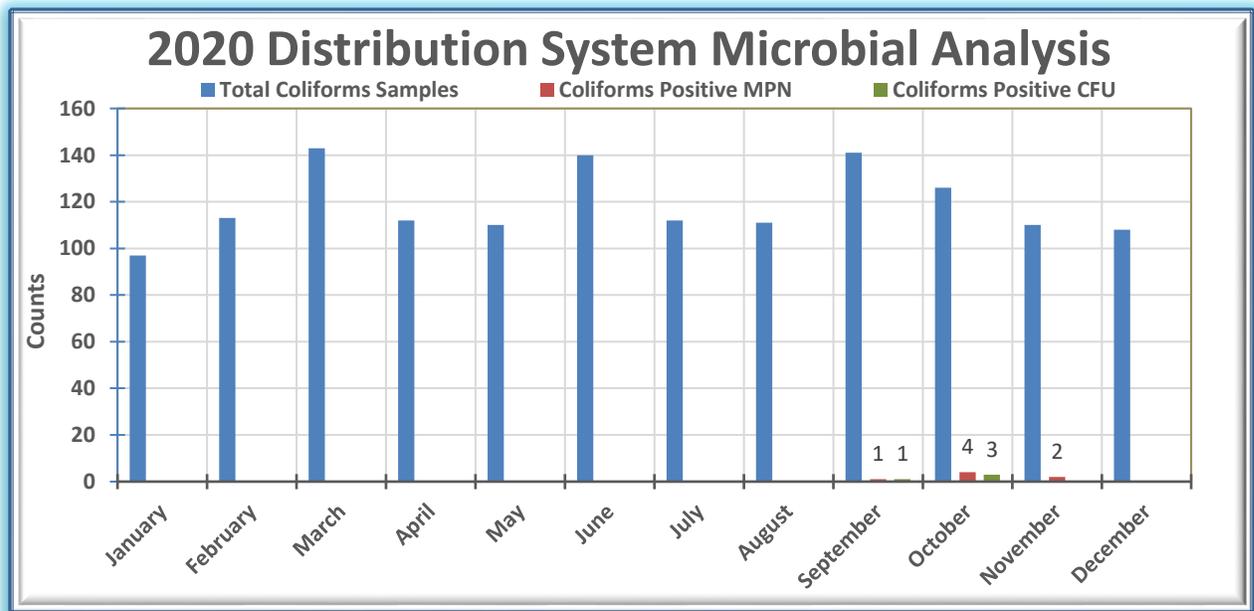


Figure 5.2.1 2020 Distribution System Microbial Analysis

On September 29 and 30, 2020 there were two consecutive positive Total Coliform samples at sample station R. Sample station R is located near a dead end main which contributed to more stagnant water in the main.

On October 6, 2020 there was a positive Total Coliform sample at sample station H.

Sample station E is located in the Tall Timber system. The Tall Timber system was connected to the existing ELWS in the fall of 2020. During this change over sample station E had a total of 6 positive Total Coliform samples. After each sample failure the water main was flushed and resampled. With the connection to the ELWS complete, the number of Total Coliform samples is expected to decrease next year.

On November 3 and 5, 2020 there were two positive Total Coliform samples at sample station AJ.

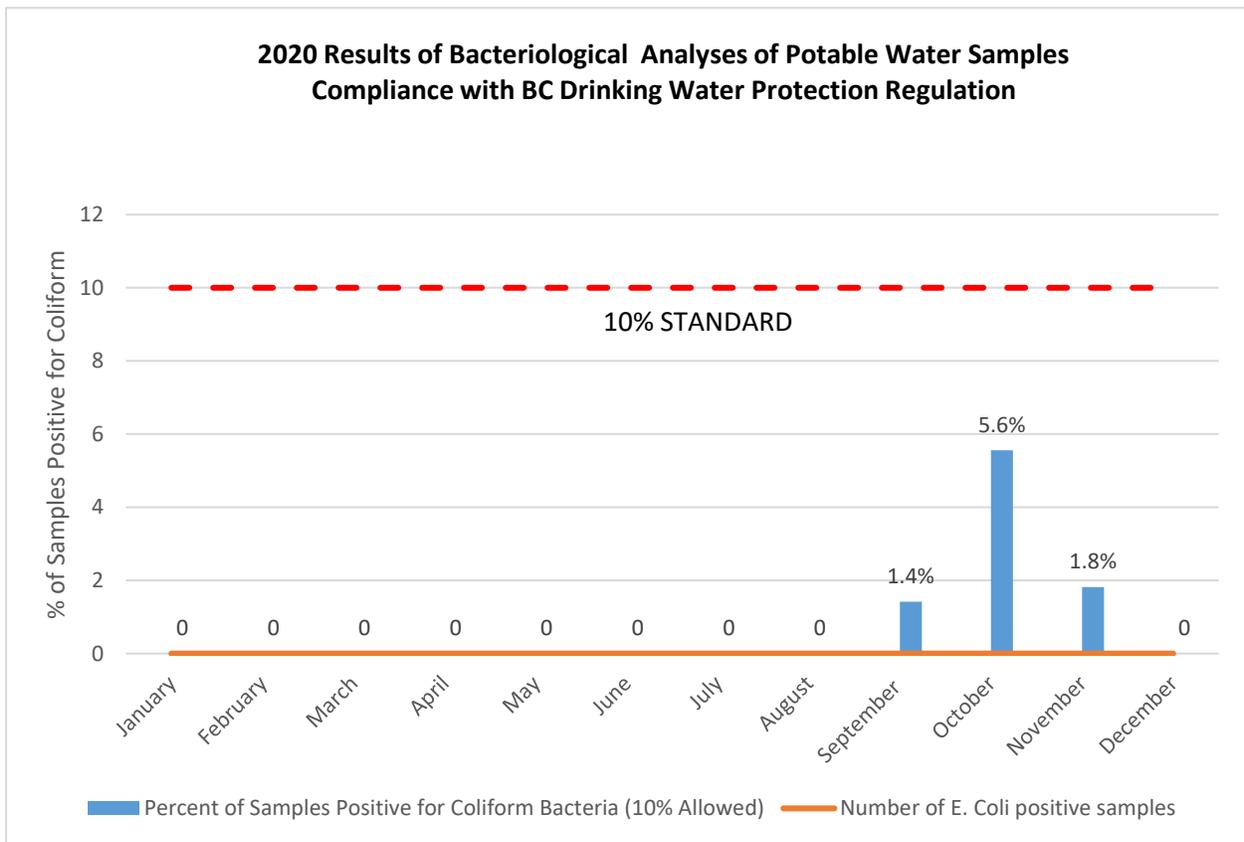


Figure 5.2.2 2020 Bacteriological Analysis in Compliance with Drinking Water Protection Regulation

The MAC for total coliform is 90% of samples taken have no detectable total coliform bacteria. In 2020, less than 1.0% of distribution system samples tested positive for total coliform bacteria. Weekly testing of distribution water resulted in 11 total coliform samples out of the 1423 samples tested.

To combat any potential errors in the future the Township is revising its sampling plan and sending more samples to GVWD labs.

### 5.3 Distribution System Physical Parameters Analysis

Weekly evaluation of the turbidity, pH, conductivity, and free chlorine levels of the distribution system provides an indication of baseline levels for each distribution point, as well as ensuring system compliance with provincial and federal guidelines. Conductivity is a new parameter as of 2017. Although some degree of fluctuation in a system is standard, the distribution water levels at sampling points tested as follows:

- **Turbidity:** 24 of 1419 samples or 1.69% of samples exceeded 1.0 NTU with an average turbidity of 0.35 NTU within a range of 0.09-4.6 NTU, the isolated occurrence of high Turbidity is thought to be due to flushing in the area
- **pH:** 1605 samples taken, average pH of 7.14 with a range of 5.38– 8.24
- **Conductivity:** 918 samples taken, average of 157.92 uS/cm with a range between 10.7- 511 uS/cm
- **Free Chlorine:** 1413 samples taken, average free chlorine was 0.432 mg/L with 1024 of distribution samples being greater than 0.2 mg/L of free chlorine

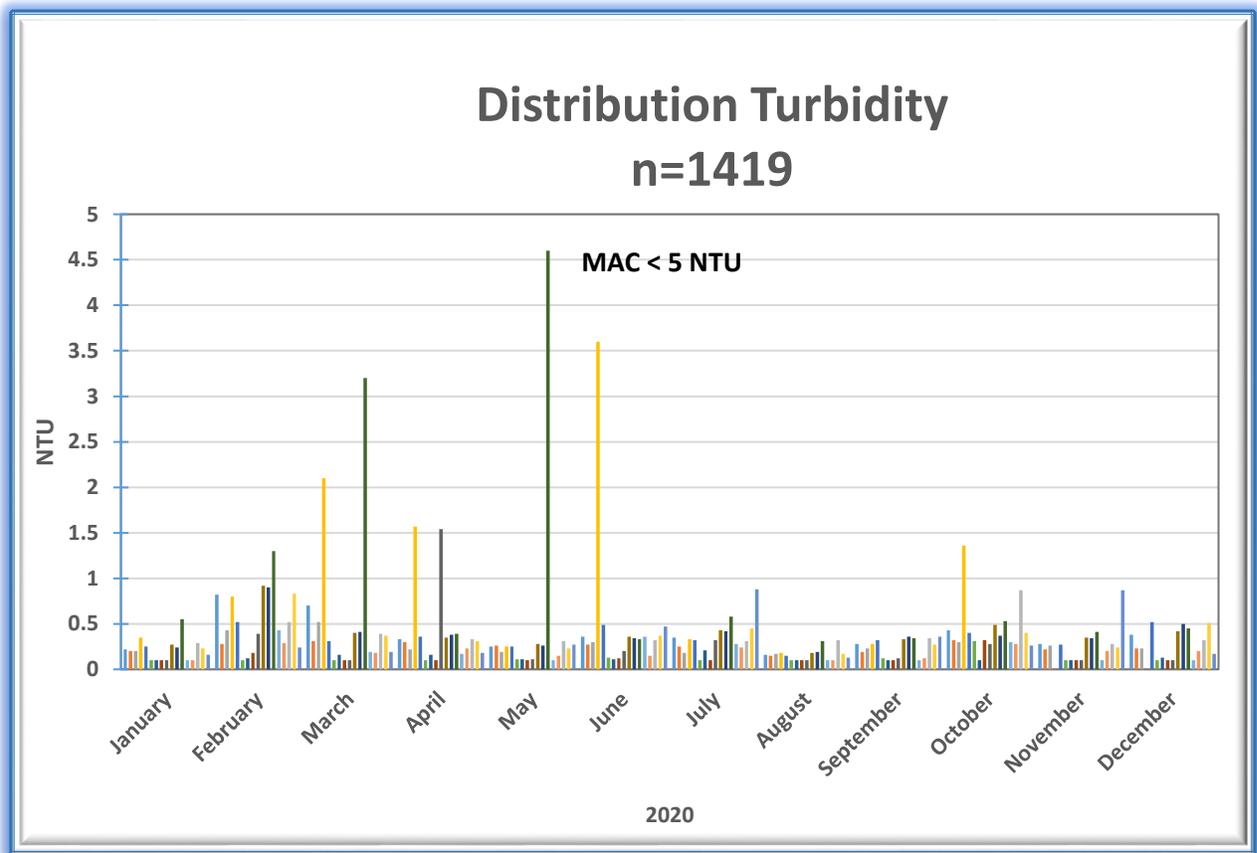


Figure 5.3.1 Distribution Turbidity

Turbidity is the cloudiness or transparency of water due to naturally occurring particles such as clay, silts and decomposed plant and animal debris in the water. Turbidity can harbour microorganisms and entrap heavy metals, negatively affecting the disinfection rate of chlorine. High levels of turbidity in the distribution system are likely a result of nearby construction or flushing in the area of sampling.

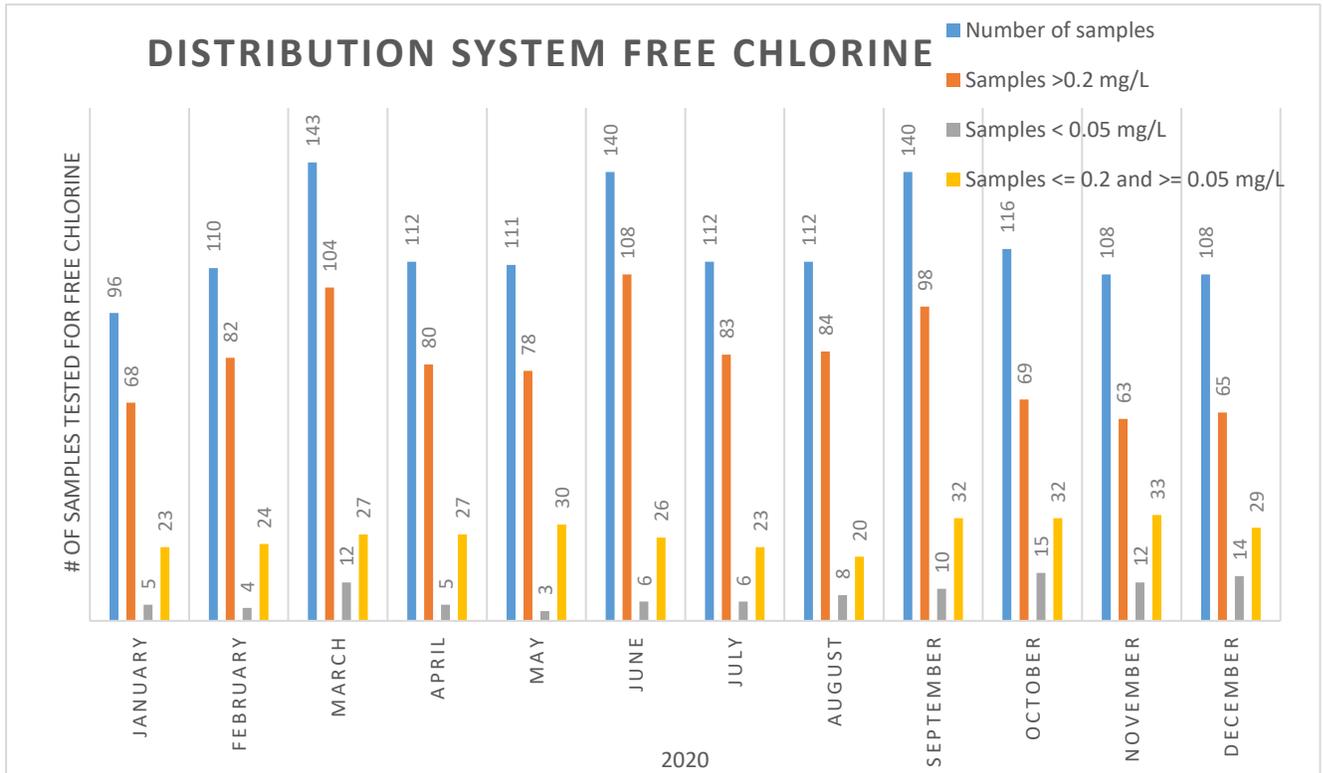


Figure 5.3.2 Free Chlorine

Sodium hypochlorite is used as secondary disinfectant in the water treatment process to maintain a free chlorine residual in the distribution system. Free chlorine residual is one measure to reduce potential microbiological regrowth and contamination while monitoring operational efficiencies. Another aspect of maintaining a free chlorine residual includes limiting the growth of biofilm buildup, and its accompanying taste and odour problems.

Though the GCDWQ do not have a MAC for chlorine, the suggested range is between 0.04-2.0 mg/L. In the Township, any reading below 0.05 mg/L (grey bar) resulted in the senior operator being informed which lead to a further investigation and a possible mitigation via resampling or flushing.

On average, there were 30 weekly samples, with no samples taken during the annual winter shutdown. The yellow bar above indicates the ideal free chlorine range of 0.05-0.2 mg/L.

#### 5.4 Distribution System Chemical Parameters Analysis

The Township conducts quarterly chemical analysis. For detailed information see

[Table B.4.1](#) and [Table B.4.2](#) in Appendix B.

## **6.0 CONCLUSION**

The 2020 water quality monitoring results indicate that Township water is potable and safe for residential consumption. Township staff continue to seek improvements to the water supply and distribution systems. The Township will continue to work closely with Fraser Health, GVWD and the public to provide high quality water to its residents.

## 7.0 References

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Township of  
Langley



Est. 1873

# Water Quality Report 2020

## Appendix A: Source Water Test Results

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Figure A. 1 Cadmium

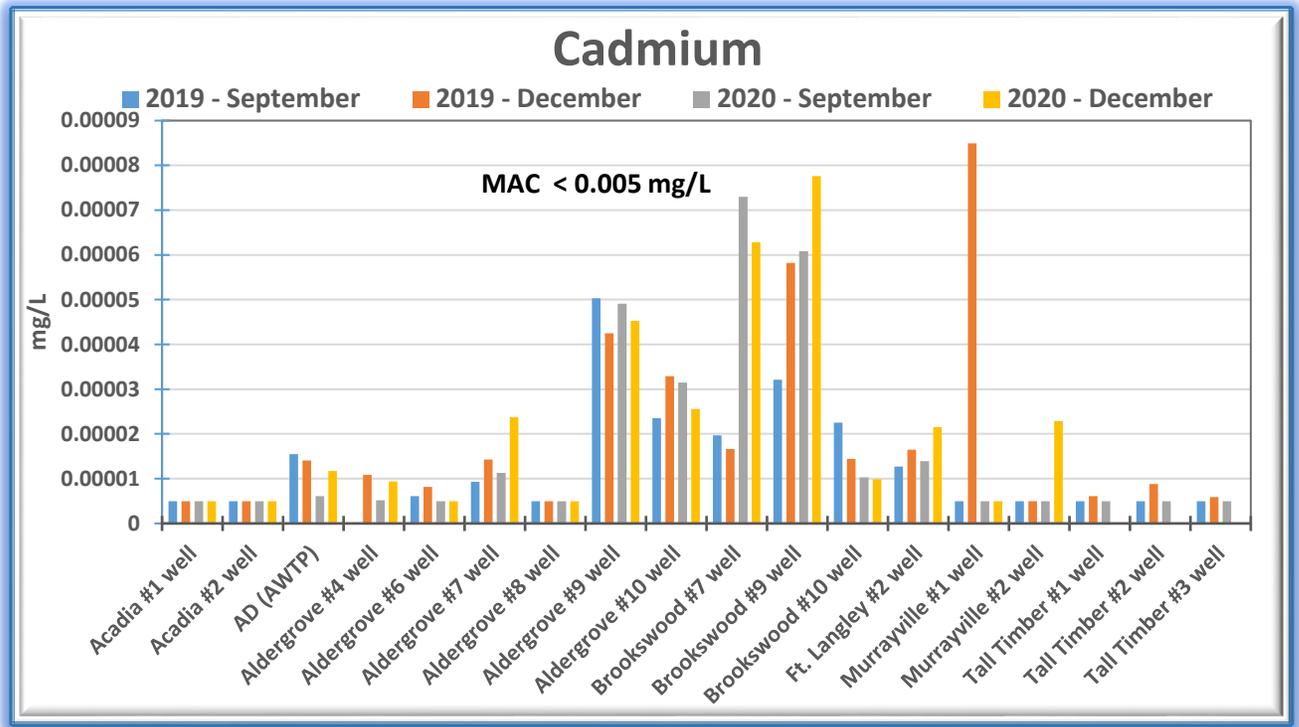
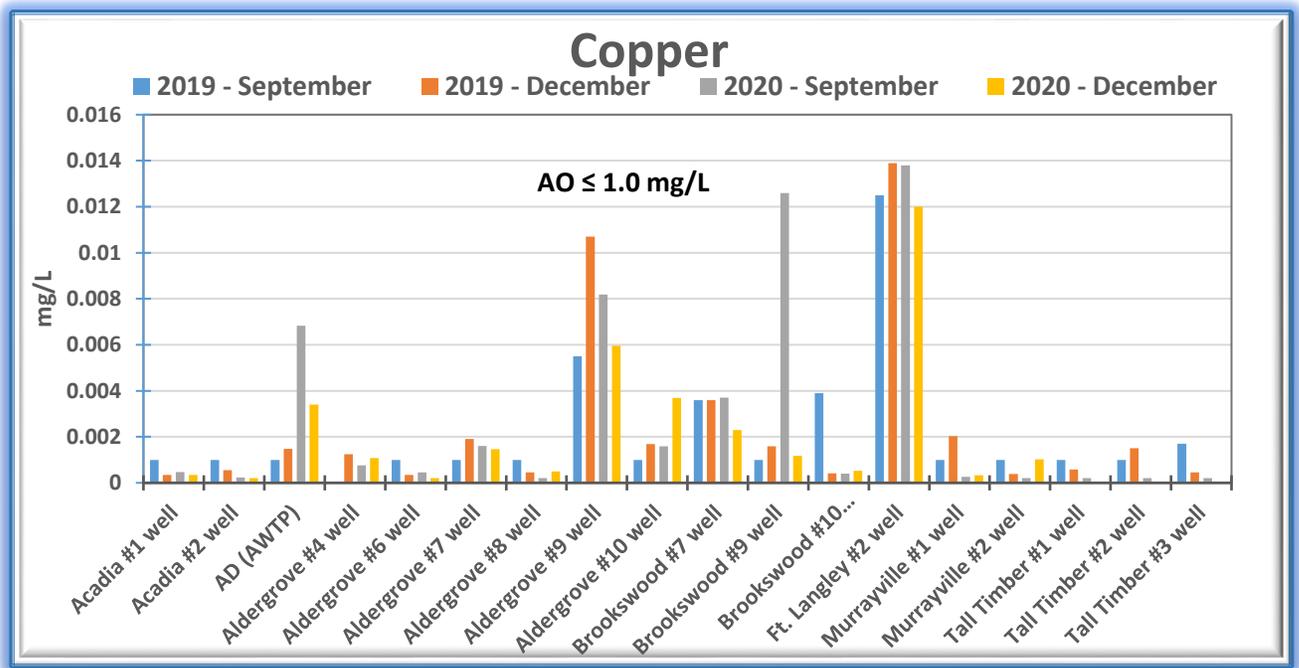
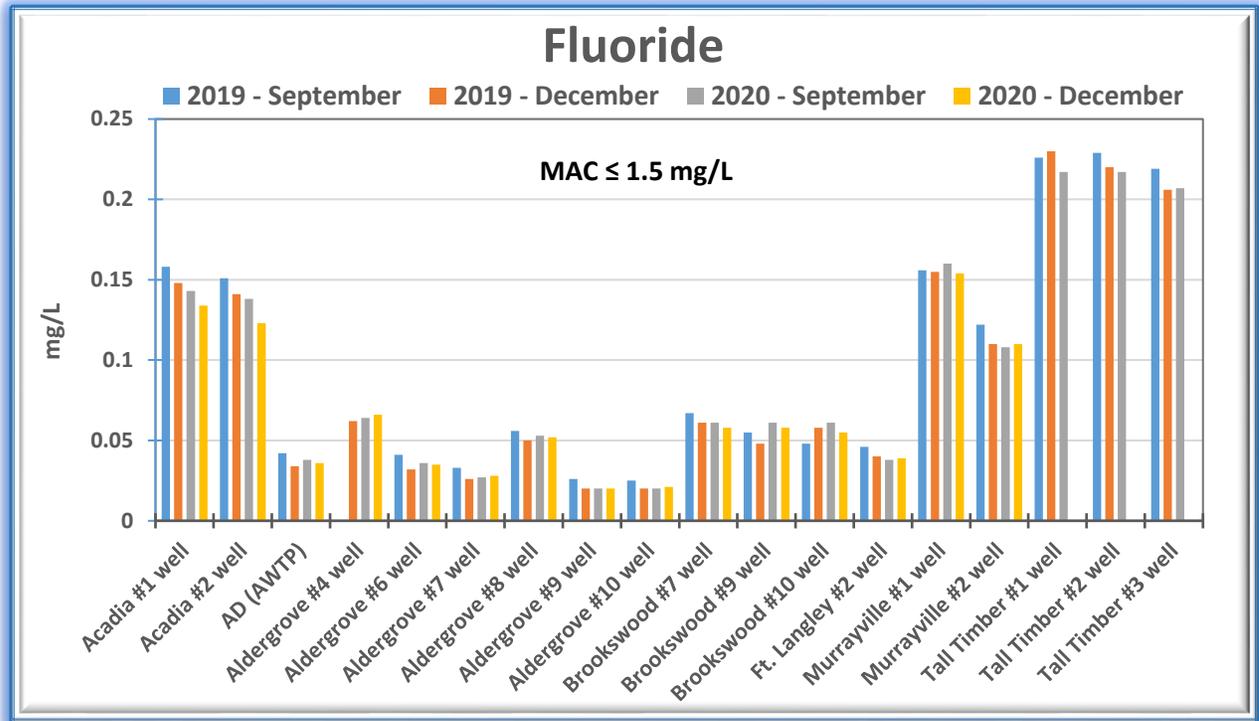


Figure A. 2 Copper



**Figure A. 3 Fluoride**



**Figure A. 4 Hardness**

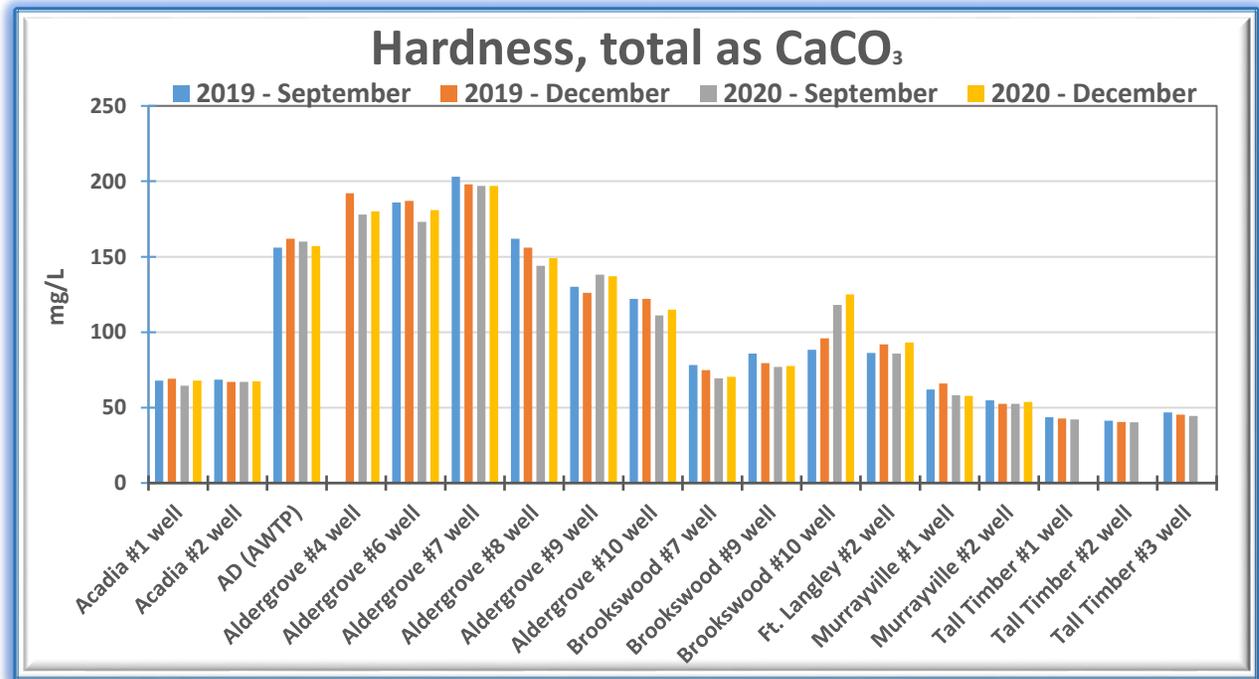


Figure A. 5 Arsenic

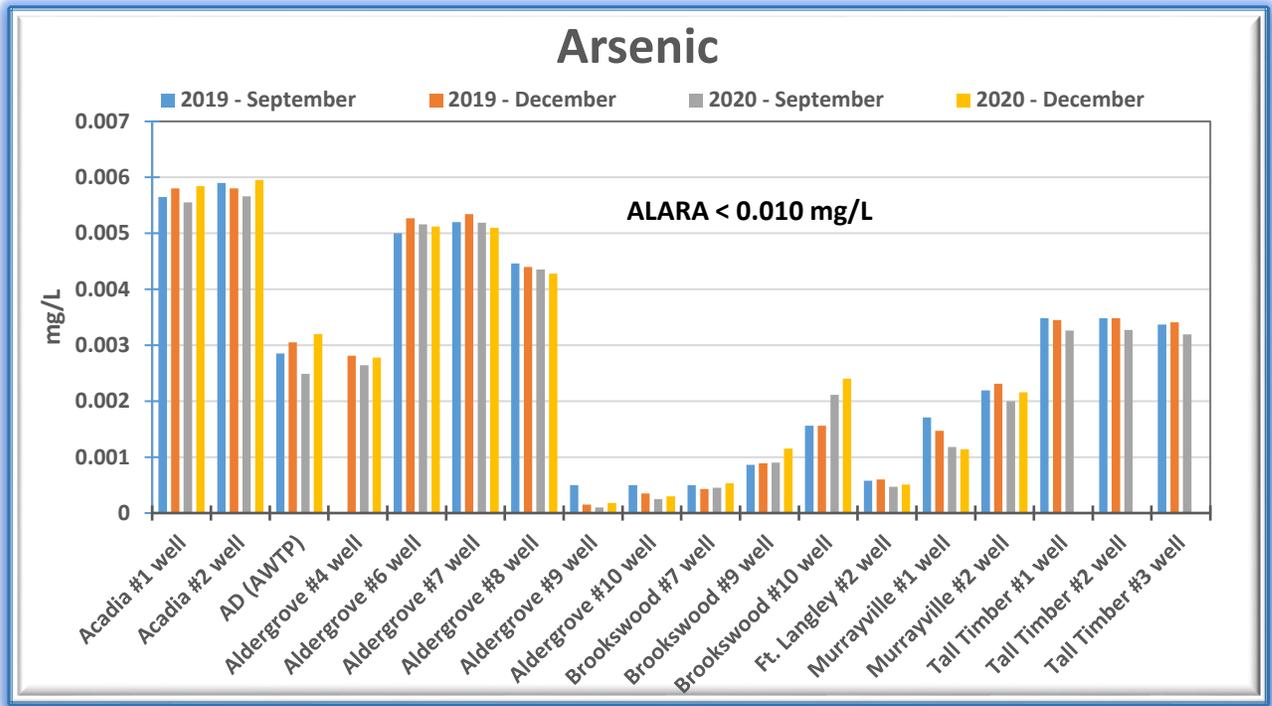


Figure A. 6 Nitrite as Nitrogen

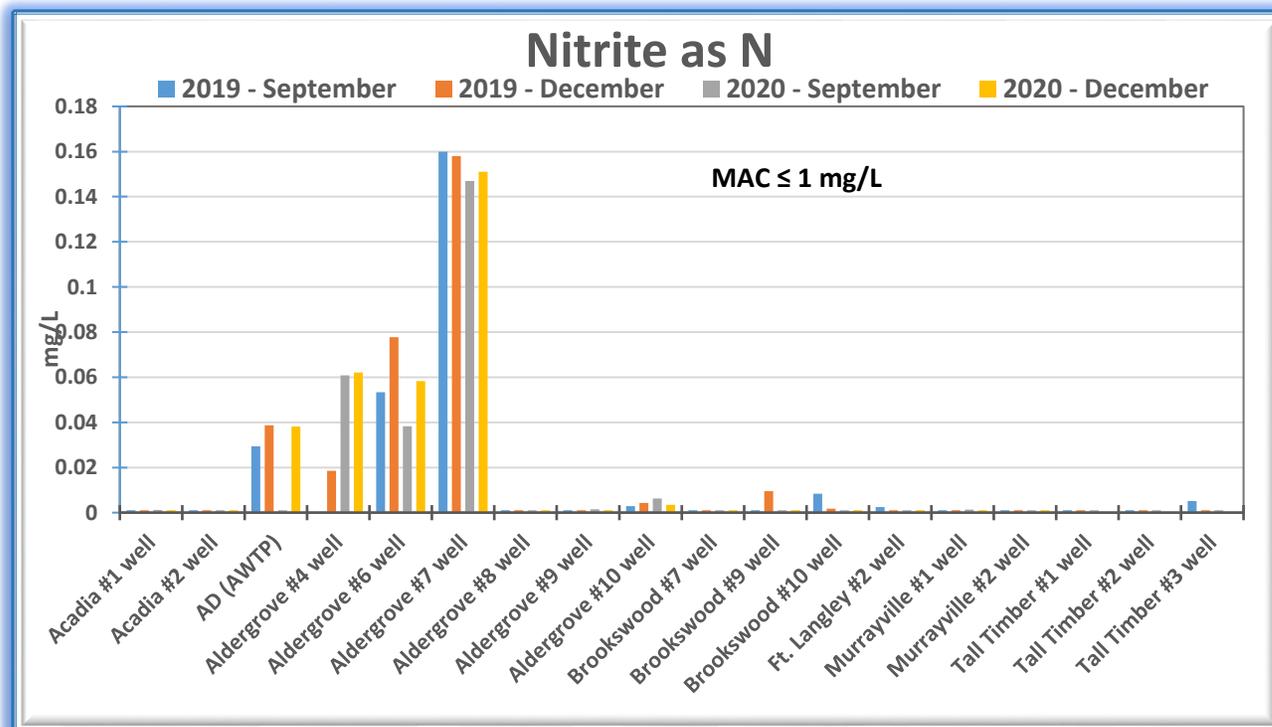


Figure A. 7 Sodium

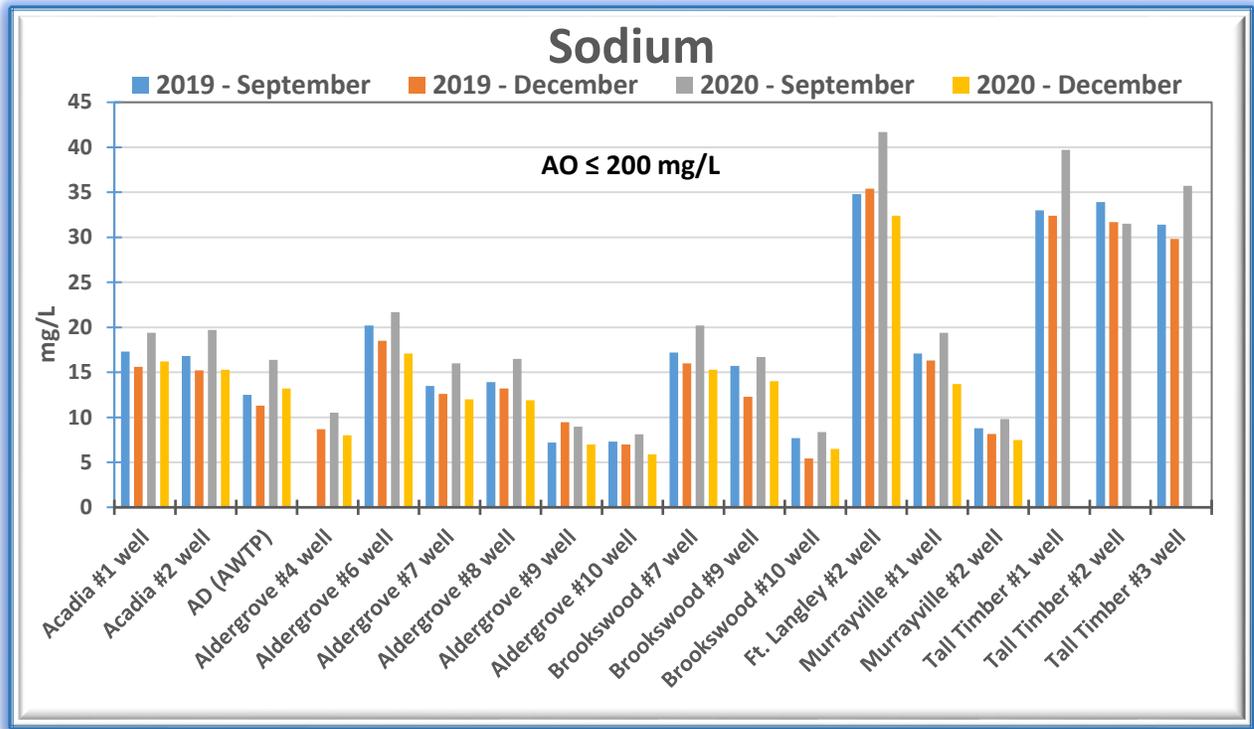
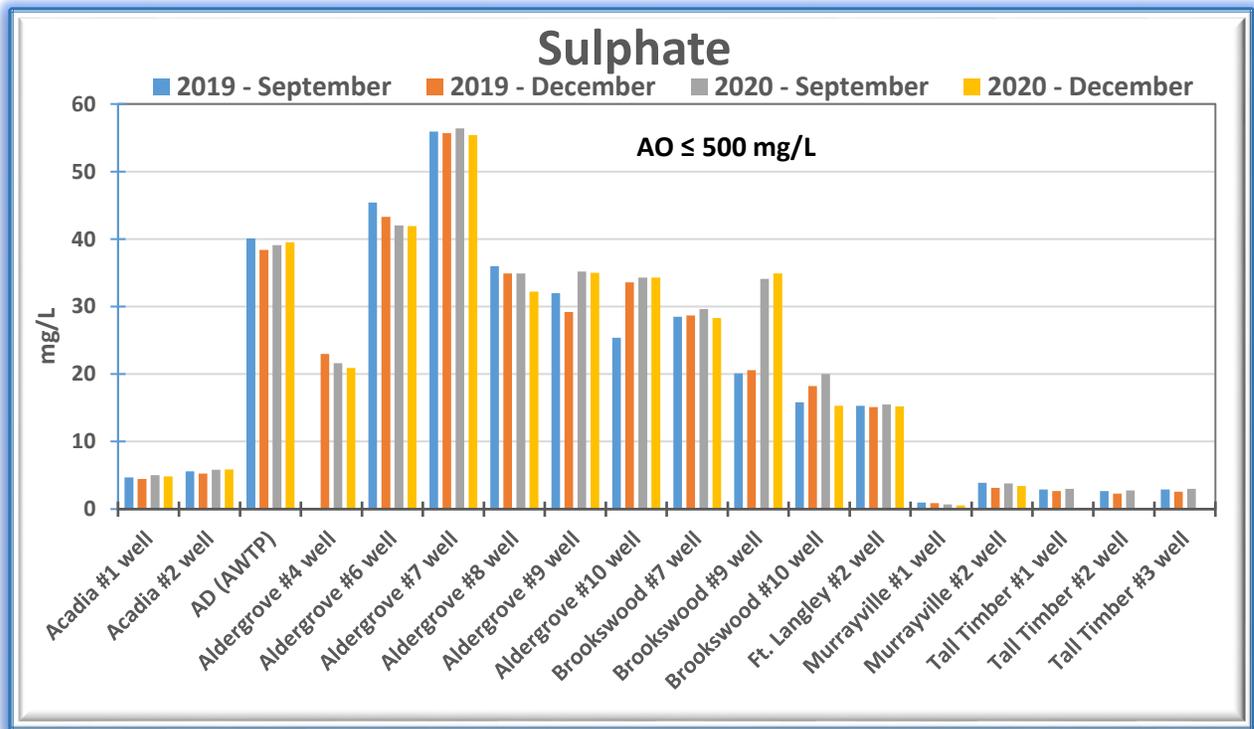
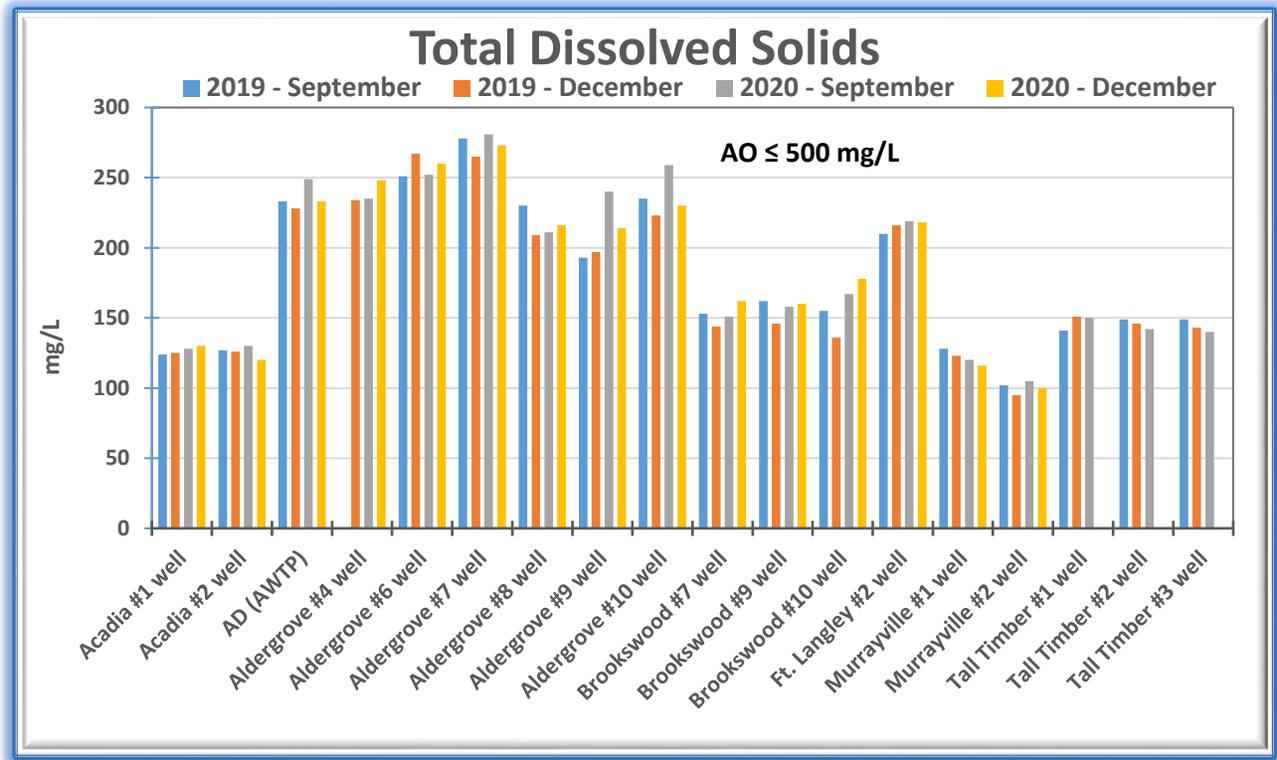


Figure A. 8 Sulphate



**Figure A. 9 Total Dissolved Solids**



Township of  
Langley



Est. 1873

# Water Quality Report 2020

## Appendix B: Raw Data

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**Table B.1 Source Water Bacteria Results 2020**

Water System	Facility	Sampling Point	Collection Date	E. Coli (MPN/100ml)	Total Coliforms (MPN/100ml)
Acadia	Wells	Acadia #1 well	03/11/2020	< 1	< 1
Acadia	Wells	Acadia #1 well	06/17/2020	< 1	< 1
Acadia	Wells	Acadia #1 well	09/03/2020	< 1	< 1
Acadia	Wells	Acadia #1 well	11/18/2020	< 1	< 1
Acadia	Wells	Acadia #2 well	03/11/2020	< 1	< 1
Acadia	Wells	Acadia #2 well	06/17/2020	< 1	< 1
Acadia	Wells	Acadia #2 well	09/03/2020	< 1	< 1
Acadia	Wells	Acadia #2 well	11/18/2020	< 1	< 1
East Langley	Wells	Aldergrove #10 well	03/11/2020	< 1	< 1
East Langley	Wells	Aldergrove #10 well	06/17/2020	< 1	< 1
East Langley	Wells	Aldergrove #10 well	09/03/2020	< 1	< 1
East Langley	Wells	Aldergrove #10 well	11/18/2020	< 1	< 1
East Langley	Wells	Aldergrove #4 well	06/17/2020	< 1	< 1
East Langley	Wells	Aldergrove #4 well	09/03/2020	< 1	< 1
East Langley	Wells	Aldergrove #4 well	11/18/2020	< 1	< 1
East Langley	Wells	Aldergrove #6 well	03/11/2020	< 1	< 1
East Langley	Wells	Aldergrove #6 well	09/03/2020	< 1	< 1
East Langley	Wells	Aldergrove #6 well	11/18/2020	< 1	< 1
East Langley	Wells	Aldergrove #7 well	03/11/2020	< 1	< 1
East Langley	Wells	Aldergrove #7 well	06/17/2020	< 1	< 1
East Langley	Wells	Aldergrove #7 well	09/03/2020	< 1	< 1
East Langley	Wells	Aldergrove #8 well	03/11/2020	< 1	< 1
East Langley	Wells	Aldergrove #8 well	06/17/2020	< 1	< 1
East Langley	Wells	Aldergrove #8 well	09/03/2020	< 1	< 1
East Langley	Wells	Aldergrove #8 well	11/18/2020	< 1	< 1
East Langley	Wells	Aldergrove #9 well	03/11/2020	< 1	< 1
East Langley	Wells	Aldergrove #9 well	06/17/2020	< 1	< 1
East Langley	Wells	Aldergrove #9 well	09/03/2020	< 1	< 1
East Langley	Wells	Aldergrove #9 well	11/18/2020	< 1	< 1
South West Langley	Wells	Brookwood #10 well	06/17/2020	< 1	27
South West Langley	Wells	Brookwood #10 well	06/19/2020	< 1	< 1
South West Langley	Wells	Brookwood #10 well	09/03/2020	< 1	< 1
South West Langley	Wells	Brookwood #10 well	11/18/2020	< 1	< 1
South West Langley	Wells	Brookwood #7 well	09/03/2020	< 1	< 1
South West Langley	Wells	Brookwood #7 well	11/18/2020	< 1	< 1
South West Langley	Wells	Brookwood #9 well	03/11/2020	< 1	< 1
South West Langley	Wells	Brookwood #9 well	06/17/2020	< 1	< 1
South West Langley	Wells	Brookwood #9 well	09/03/2020	< 1	< 1
South West Langley	Wells	Brookwood #9 well	11/18/2020	< 1	< 1
South West Langley	Wells	Murrayville #1 well	03/11/2020	< 1	< 1
South West Langley	Wells	Murrayville #1 well	06/17/2020	< 1	< 1
South West Langley	Wells	Murrayville #1 well	09/03/2020	< 1	< 1

Water System	Facility	Sampling Point	Collection Date	E. Coli (MPN/100ml)	Total Coliforms (MPN/100ml)
South West Langley	Wells	Murrayville #1 well	11/18/2020	< 1	< 1
South West Langley	Wells	Murrayville #2 well	03/11/2020	< 1	< 1
South West Langley	Wells	Murrayville #2 well	06/17/2020	< 1	< 1
South West Langley	Wells	Murrayville #2 well	09/03/2020	< 1	< 1
South West Langley	Wells	Murrayville #2 well	11/18/2020	< 1	< 1
Tall Timber	Wells	Tall Timber #1 well	03/11/2020	< 1	< 1
Tall Timber	Wells	Tall Timber #1 well	06/17/2020	< 1	< 1
Tall Timber	Wells	Tall Timber #1 well	09/03/2020	< 1	< 1
Tall Timber	Wells	Tall Timber #2 well	03/11/2020	< 1	< 1
Tall Timber	Wells	Tall Timber #2 well	06/17/2020	< 1	< 1
Tall Timber	Wells	Tall Timber #3 well	03/11/2020	< 1	< 1
Tall Timber	Wells	Tall Timber #3 well	06/17/2020	< 1	< 1
Tall Timber	Wells	Tall Timber #3 well	09/03/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	01/07/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	01/14/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	01/21/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	01/28/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	02/04/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	02/11/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	02/18/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	02/25/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	03/03/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	03/10/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	03/11/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	03/17/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	03/24/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	03/31/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	04/07/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	04/14/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	04/21/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	04/28/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	05/05/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	05/12/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	05/19/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	05/26/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	06/02/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	06/09/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	06/16/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	06/17/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	06/23/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	06/30/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	07/07/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	07/14/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	07/21/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	07/28/2020	< 1	< 1

Water System	Facility	Sampling Point	Collection Date	E. Coli (MPN/100ml)	Total Coliforms (MPN/100ml)
Northwest Langley	Wells	Ft. Langley #2 well	08/04/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	08/11/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	08/18/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	08/25/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	09/01/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	09/03/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	09/08/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	09/15/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	09/22/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	09/29/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	10/06/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	10/13/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	10/27/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	11/03/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	11/10/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	11/17/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	11/18/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	11/24/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	12/01/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	12/08/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	12/15/2020	< 1	< 1
Northwest Langley	Wells	Ft. Langley #2 well	12/22/2020	< 1	< 1

Table B.2 Source Water Summer and Winter Routine Parameter Testing

Sampling Point	Collection Date	Bromodichloromethane (dichlorobromomethane)	Bromoform	Calcium (total)	Chlorine (free)	Chloroform	cis and trans-1,3-Dichloropropene	Colour	Conductivity	Dibromochloromethane (Chlorodibromomethane)	E. coli (MPN)	Hardness (total, as CaCO3)	HPC	Magnesium (total)	pH	Potassium (total)	Sodium (total)	Temperature	Total Coliforms (MPN)	Total Organic Carbon / TOC	Turbidity	Vinyl chloride	1,1,1-Trichloroethane	1,1,1,2-Tetrachloroethane (volatile dissolved)	1,1,2-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1-Dichloroethane	1,1-Dichloroethylene	
		ug/L	ug/L	mg/L	mg/L	ug/L	mg/L	CU	uS/cm	ug/L	MPN/100 ml	mg/L	CFU/ml	mg/L		mg/L	mg/L	°C	MPN/100 ml	mg/L	NTU	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
Acadia #1 well	03/11/2020										< 1		< 1						< 1										
Acadia #1 well	06/17/2020										< 1		< 1						< 1										
Acadia #1 well	09/03/2020	< 0.50	< 0.50	15.0		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	64.6	< 1	6.58	8.21	2.93	15.6		< 1	< 0.50	0.15	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Acadia #1 well	11/18/2020										< 1								< 1										
Acadia #1 well	12/02/2020	< 0.50	< 0.50	16.0		< 0.50	< 0.00075	< 5.0		< 0.50		67.8		6.74	8.26	2.76	15.0			< 0.50	< 0.10	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Acadia #2 well	03/11/2020										< 1		< 1						< 1										
Acadia #2 well	06/17/2020										< 1		< 1						< 1										
Acadia #2 well	09/03/2020	< 0.50	< 0.50	15.7		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	67.0	< 1	6.78	8.25	2.93	15.4		< 1	< 0.50	0.30**	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Acadia #2 well	11/18/2020										< 1								< 1										
Acadia #2 well	12/02/2020	< 0.50	< 0.50	16.0		< 0.50	< 0.00075	< 5.0		< 0.50		67.5		6.71	8.07	2.76	13.9			< 0.50	0.11	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #10 well	03/11/2020										< 1		< 1						< 1										
Aldergrove #10 well	06/17/2020										< 1		< 1						< 1										
Aldergrove #10 well	09/03/2020	< 0.50	< 0.50	30.4		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	111	< 1	8.61	7.12	1.07	6.43		< 1	< 0.50	0.10	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #10 well	11/18/2020										< 1								< 1										
Aldergrove #10 well	12/02/2020	< 0.50	< 0.50	31.4		< 0.50	< 0.00075	< 5.0		< 0.50		115		8.96	7.28	0.960	6.12			< 0.50	< 0.10	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #4 well	06/17/2020										< 1		< 1						< 1										
Aldergrove #4 well	09/03/2020	< 0.50	< 0.50	47.7		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	178	< 1	14.4	8.15	4.89	8.30		< 1	< 0.50	0.62**	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #4 well	11/18/2020										< 1								< 1										
Aldergrove #4 well	12/02/2020	< 0.50	< 0.50	48.7		< 0.50	< 0.00075	< 5.0		< 0.50		180		14.2	8.12	4.58	7.76			< 0.50	0.91	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #6 well	03/11/2020										< 1		< 1						< 1										
Aldergrove #6 well	09/03/2020	< 0.50	< 0.50	47.6		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	173	< 1	13.2	8.24	5.10	17.5		< 1	1.00	0.18**	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #6 well	11/18/2020										< 1								< 1										
Aldergrove #6 well	12/02/2020	< 0.50	< 0.50	50.5		< 0.50	< 0.00075	< 5.0		< 0.50		181		13.3	8.19	4.98	16.2			0.79	0.23	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #7 well	03/11/2020										< 1		< 1						< 1										
Aldergrove #7 well	06/17/2020										< 1		< 1						< 1										
Aldergrove #7 well	09/03/2020	< 0.50	< 0.50	52.7		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	197	< 1	16.0	8.30	5.25	12.6		< 1	1.00	0.16**	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #7 well	12/02/2020	< 0.50	< 0.50	52.4		< 0.50	< 0.00075	< 5.0		< 0.50		197		16.0	8.26	5.03	11.8			0.90	< 0.10	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #8 well	03/11/2020										< 1		< 1						< 1										
Aldergrove #8 well	06/17/2020										< 1		< 1						< 1										
Aldergrove #8 well	09/03/2020	< 0.50	< 0.50	36.6		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	144	< 1	12.7	8.27	3.82	12.8		< 1	0.58	0.26**	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #8 well	11/18/2020										< 1								< 1										
Aldergrove #8 well	12/02/2020	< 0.50	< 0.50	38.4		< 0.50	< 0.00075	< 5.0		< 0.50		149		12.9	8.22	3.43	11.7			< 0.50	0.22	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #9 well	03/11/2020										< 1		< 1						< 1										
Aldergrove #9 well	06/17/2020										< 1		< 1						< 1										
Aldergrove #9 well	09/03/2020	< 0.50	< 0.50	36.0		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	138	< 1	11.5	6.62	1.27	7.38		< 1	1.39	0.21	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Aldergrove #9 well	11/18/2020										< 1								< 1										
Aldergrove #9 well	12/02/2020	< 0.50	< 0.50	36.3		< 0.50	< 0.00075	< 5.0		< 0.50		137		11.4	6.87	1.11	6.72			1.32	< 0.10	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Ft. Langley #2 well	09/03/2020	< 0.50	< 0.50	20.6		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	85.9	< 1	8.38	7.01	2.35	32.4		< 1	0.52	0.30	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Ft. Langley #2 well	12/02/2020	< 0.50	< 0.50	22.6		< 0.50	< 0.00075	< 5.0		< 0.50		93.1		8.92	6.94	2.24	32.2			0.51	< 0.10	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Brookwood #10 well	06/17/2020										< 1		< 1						27										

Sampling Point	Collection Date	Bromodichloromethane (dichlorobromomethane)	Bromoform	Calcium (total)	Chlorine (free)	Chloroform	cis and trans-1,3-Dichloropropene	Colour	Conductivity	Dibromochloromethane (Chlorodibromomethane)	E. coli (MPN)	Hardness (total, as CaCO3)	HPC	Magnesium (total)	pH	Potassium (total)	Sodium (total)	Temperature	Total Coliforms (MPN)	Total Organic Carbon / TOC	Turbidity	Vinyl chloride	1,1,1-Trichloroethane	1,1,1,2-Tetrachloroethane (volatile dissolved)	1,1,2-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1-Dichloroethane	1,1-Dichloroethylene	
Brookwood #10 well	06/19/2020										< 1								< 1										
Brookwood #10 well	09/03/2020	< 0.50	< 0.50	35.8		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	118	2	6.93	7.99	1.52	6.69		< 1	1.12	0.43**	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Brookwood #10 well	11/18/2020										< 1								< 1										
Brookwood #10 well	12/02/2020	< 0.50	< 0.50	38.4		< 0.50	< 0.00075	< 5.0		< 0.50		125		7.04	7.78	1.42	6.45			0.53	0.78	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Brookwood #7 well	09/03/2020	< 0.50	< 0.50	19.5		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	69.3	10	5.01	7.35	1.68	17.2		< 1	1.09	0.57**	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Brookwood #7 well	11/18/2020										< 1								< 1										
Brookwood #7 well	12/02/2020	< 0.50	< 0.50	20.0		0.77	< 0.00075	< 5.0		< 0.50		70.4		4.95	7.22	1.44	15.6			0.92	0.51	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Brookwood #9 well	03/11/2020										< 1		< 1						< 1										
Brookwood #9 well	06/17/2020										< 1		< 1						< 1										
Brookwood #9 well	09/03/2020	< 0.50	< 0.50	20.8		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	77.0	14	6.10	7.29	2.40	13.5		< 1	1.22	1.70**	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Brookwood #9 well	11/18/2020										< 1								< 1										
Brookwood #9 well	12/02/2020	< 0.50	< 0.50	20.8		< 0.50	< 0.00075	< 5.0		< 0.50		77.6		6.24	7.28	2.32	13.5			0.56	3.56	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Murrayville #1 well	03/11/2020										< 1		< 1						< 1										
Murrayville #1 well	06/17/2020										< 1		< 1						< 1										
Murrayville #1 well	09/03/2020	< 0.50	< 0.50	13.9		< 0.50	< 0.00075	5.8		< 0.50	< 1	58.1	< 1	5.70	8.32	2.17	15.0		< 1	0.86	1.42**	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Murrayville #1 well	11/18/2020										< 1								< 1										
Murrayville #1 well	12/02/2020	< 0.50	< 0.50	14.0		< 0.50	< 0.00075	< 5.0		< 0.50		57.8		5.56	8.20	1.90	13.5			< 0.50	0.36	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Murrayville #2 well	03/11/2020										< 1		< 1						< 1										
Murrayville #2 well	06/17/2020										< 1		< 1						< 1										
Murrayville #2 well	09/03/2020	< 0.50	< 0.50	12.1		< 0.50	< 0.00075	< 5.0		< 0.50	< 1	52.5	< 1	5.44	8.09	1.76	7.76		< 1	< 0.50	0.60**	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Murrayville #2 well	11/18/2020										< 1								< 1										
Murrayville #2 well	12/02/2020	< 0.50	< 0.50	12.2		< 0.50	< 0.00075	< 5.0		< 0.50		53.8		5.65	7.96	1.57	7.30			< 0.50	0.41	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Tall Timber #1 well	03/11/2020										< 1		< 1						< 1										
Tall Timber #1 well	06/17/2020										< 1		< 1						< 1										
Tall Timber #1 well	09/03/2020	< 0.50	< 0.50	9.81		< 0.50	< 0.00075	6.9		< 0.50	< 1	42.1	< 1	4.28	8.39	3.79	30.7		< 1	0.80	1.09	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Tall Timber #2 well	03/11/2020										< 1		< 1						< 1										
Tall Timber #2 well	06/17/2020										< 1		< 1						< 1										
Tall Timber #2 well	09/09/2020	< 0.50	< 0.50	9.29		< 0.50	< 0.00075	7.6		< 0.50		40.3		4.15	8.23	3.56	32.3			0.97	< 0.10	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	
Tall Timber #3 well	03/11/2020										< 1		< 1						< 1										
Tall Timber #3 well	06/17/2020										< 1		< 1						< 1										
Tall Timber #3 well	09/03/2020	< 0.50	< 0.50	10.2		< 0.50	< 0.00075	5.1		< 0.50	< 1	44.5	< 1	4.64	8.37	3.81	28.6		< 1	0.91	0.22**	< 0.40	< 0.50	< 0.50	< 0.50	< 0.20	< 0.50	< 0.50	

Sampling Point	Collection Date	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2,3,4,6-Tetrachlorophenol	2,4,5-Trichlorophenoxyacetic acid / 2,4,5-T	2,4,6-Trichlorophenol	2,4'-DDT (o,p-DDT)	2,4-Dichlorophenol	2,4-Dichlorophenoxyacetic acid / 2,4-D	2-Methyl naphthalene	4,4'-DDD (pp-DDD)	4,4'-DDE (pp-DDE)	4,4'-DDT (pp-DDT)	Total Chlordane	Acenaphthene	Acenaphthylene	Acridine	Alachlor	Aldicarb	Aldrin	Alkalinity (total, as CaCO3)	alpha-BHC
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L
Acadia #1 well	03/11/2020																								
Acadia #1 well	06/17/2020																								
Acadia #1 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Acadia #1 well	11/18/2020																								
Acadia #1 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50							< 0.010					< 0.010	< 0.010	< 0.010					
Acadia #2 well	03/11/2020																								
Acadia #2 well	06/17/2020																								
Acadia #2 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Acadia #2 well	11/18/2020																								
Acadia #2 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50							< 0.010					< 0.010	< 0.010	< 0.010					
Aldergrove #10 well	03/11/2020																								
Aldergrove #10 well	06/17/2020																								
Aldergrove #10 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Aldergrove #10 well	11/18/2020																								
Aldergrove #10 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50							< 0.010					< 0.010	< 0.010	< 0.010					
Aldergrove #4 well	06/17/2020																								
Aldergrove #4 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Aldergrove #4 well	11/18/2020																								
Aldergrove #4 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50							< 0.010					< 0.010	< 0.010	< 0.010					
Aldergrove #6 well	03/11/2020																								
Aldergrove #6 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Aldergrove #6 well	11/18/2020																								
Aldergrove #6 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50							< 0.010					< 0.010	< 0.010	< 0.010					
Aldergrove #7 well	03/11/2020																								
Aldergrove #7 well	06/17/2020																								
Aldergrove #7 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Aldergrove #7 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50							< 0.010					< 0.010	< 0.010	< 0.010					
Aldergrove #8 well	03/11/2020																								
Aldergrove #8 well	06/17/2020																								
Aldergrove #8 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Aldergrove #8 well	11/18/2020																								
Aldergrove #8 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50							< 0.010					< 0.010	< 0.010	< 0.010					
Aldergrove #9 well	03/11/2020																								
Aldergrove #9 well	06/17/2020																								
Aldergrove #9 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Aldergrove #9 well	11/18/2020																								
Aldergrove #9 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50							< 0.010					< 0.010	< 0.010	< 0.010					
Ft. Langley #2 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Ft. Langley #2 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50							< 0.010					< 0.010	< 0.010	< 0.010					
Brookwood #10 well	06/17/2020																								

Sampling Point	Collection Date	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2,3,4,6-Tetrachlorophenol	2,4,5-Trichlorophenoxyacetic acid / 2,4,5-T	2,4,6-Trichlorophenol	2,4'-DDT (o,p-DDT)	2,4-Dichlorophenol	2,4-Dichlorophenoxyacetic acid / 2,4-D	2-Methylnaphthalene	4,4'-DDD (pp-DDD)	4,4'-DDE (pp-DDE)	4,4'-DDT (pp-DDT)	Total Chlordane	Acenaphthene	Acenaphthylene	Acridine	Alachlor	Aldicarb	Aldrin	Alkalinity (total, as CaCO3)	alpha-BHC
Brookwood #10 well	06/19/2020																								
Brookwood #10 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Brookwood #10 well	11/18/2020																								
Brookwood #10 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50						< 0.010						< 0.010	< 0.010	< 0.010					
Brookwood #7 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Brookwood #7 well	11/18/2020																								
Brookwood #7 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50						< 0.010						< 0.010	< 0.010	< 0.010					
Brookwood #9 well	03/11/2020																								
Brookwood #9 well	06/17/2020																								
Brookwood #9 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Brookwood #9 well	11/18/2020																								
Brookwood #9 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50						< 0.010						< 0.010	< 0.010	< 0.010					
Murrayville #1 well	03/11/2020																								
Murrayville #1 well	06/17/2020																								
Murrayville #1 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Murrayville #1 well	11/18/2020																								
Murrayville #1 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50						< 0.010						< 0.010	< 0.010	< 0.010					
Murrayville #2 well	03/11/2020																								
Murrayville #2 well	06/17/2020																								
Murrayville #2 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Murrayville #2 well	11/18/2020																								
Murrayville #2 well	12/02/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50						< 0.010						< 0.010	< 0.010	< 0.010					
Tall Timber #1 well	03/11/2020																								
Tall Timber #1 well	06/17/2020																								
Tall Timber #1 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Tall Timber #2 well	03/11/2020																								
Tall Timber #2 well	06/17/2020																								
Tall Timber #2 well	09/09/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	
Tall Timber #3 well	03/11/2020																								
Tall Timber #3 well	06/17/2020																								
Tall Timber #3 well	09/03/2020	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.050	< 0.50	< 0.0040	< 0.30	< 0.050	< 0.010	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.010	< 0.010	< 0.010	< 0.10	< 1.0	< 0.0080	< 0.0080	

Sampling Point	Collection Date	Aluminum (dissolved)	Aluminum (total)	Ametryn	Anthracene	Antimony (dissolved)	Antimony (total)	Arsenic (dissolved)	Arsenic (total)	Atrazine	Atrazine + N-dealkylated metabolites	Atrazine-desethyl (DEA)	Azinphos-methyl	Barium (dissolved)	Barium (total)	Bendiocarb	Benzo(a)anthracene	Benzene	Benzo(b,j,k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzo(a)pyrene	Beryllium (dissolved)	Beryllium (total)	beta-BHC	Bismuth (dissolved)	Bismuth (total)
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Acadia #1 well	03/11/2020																										
Acadia #1 well	06/17/2020																										
Acadia #1 well	09/03/2020	1.1	< 3.0	< 0.10	< 0.010	< 0.10	< 0.10	5.55	5.87	< 0.10	< 0.20	< 0.10	< 0.10	10.4	10.7	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Acadia #1 well	11/18/2020																										
Acadia #1 well	12/02/2020	< 1.0	< 3.0		< 0.010	< 0.10	< 0.10	5.84	5.21					10.0	9.09		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Acadia #2 well	03/11/2020																										
Acadia #2 well	06/17/2020																										
Acadia #2 well	09/03/2020	1.3	< 3.0	< 0.10	< 0.010	< 0.10	< 0.10	5.66	5.76	< 0.10	< 0.20	< 0.10	< 0.10	10.0	9.77	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Acadia #2 well	11/18/2020																										
Acadia #2 well	12/02/2020	1.4	< 3.0		< 0.010	< 0.10	< 0.10	5.95	5.38					9.40	8.93		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Aldergrove #10 well	03/11/2020																										
Aldergrove #10 well	06/17/2020																										
Aldergrove #10 well	09/03/2020	< 1.0	< 3.0	< 0.10	< 0.010	< 0.10	< 0.10	0.25	0.36	< 0.10	< 0.20	< 0.10	< 0.10	15.9	15.6	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Aldergrove #10 well	11/18/2020																										
Aldergrove #10 well	12/02/2020	< 1.0	4.2		< 0.010	< 0.10	< 0.10	0.30	0.34					16.0	14.5		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Aldergrove #4 well	06/17/2020																										
Aldergrove #4 well	09/03/2020	< 1.0	< 3.0	< 0.10	< 0.010	0.34	0.36	2.64	2.74	< 0.10	< 0.20	< 0.10	< 0.10	62.8	63.0	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Aldergrove #4 well	11/18/2020																										
Aldergrove #4 well	12/02/2020	1.1	< 3.0		< 0.010	0.34	0.34	2.78	2.50					57.4	57.1		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Aldergrove #6 well	03/11/2020																										
Aldergrove #6 well	09/03/2020	1.1	< 3.0	< 0.10	< 0.010	0.23	0.23	5.16	5.26	< 0.10	< 0.20	< 0.10	< 0.10	65.9	67.0	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Aldergrove #6 well	11/18/2020																										
Aldergrove #6 well	12/02/2020	1.4	< 3.0		< 0.010	0.25	0.24	5.12	4.79					61.0	59.0		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Aldergrove #7 well	03/11/2020																										
Aldergrove #7 well	06/17/2020																										
Aldergrove #7 well	09/03/2020	1.6	< 3.0	< 0.10	< 0.010	0.76	0.74	5.19	5.45	< 0.10	< 0.20	< 0.10	< 0.10	102	98.7	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Aldergrove #7 well	12/02/2020	1.6	< 3.0		< 0.010	0.79	0.72	5.10	4.86					94.0	96.8		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Aldergrove #8 well	03/11/2020																										
Aldergrove #8 well	06/17/2020																										
Aldergrove #8 well	09/03/2020	1.4	< 3.0	< 0.10	< 0.010	< 0.10	< 0.10	4.35	4.22	< 0.10	< 0.20	< 0.10	< 0.10	49.8	50.9	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Aldergrove #8 well	11/18/2020																										
Aldergrove #8 well	12/02/2020	1.3	3.2		< 0.010	< 0.10	< 0.10	4.28	4.04					49.4	46.5		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Aldergrove #9 well	03/11/2020																										
Aldergrove #9 well	06/17/2020																										
Aldergrove #9 well	09/03/2020	1.6	< 3.0	< 0.10	< 0.010	< 0.10	< 0.10	0.10	0.22	< 0.10	< 0.20	< 0.10	< 0.10	10.8	10.9	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Aldergrove #9 well	11/18/2020																										
Aldergrove #9 well	12/02/2020	1.1	< 3.0		< 0.010	< 0.10	< 0.10	0.18	0.20					10.1	9.62		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Ft. Langley #2 well	09/03/2020	< 1.0	< 3.0	< 0.10	< 0.010	< 0.10	< 0.10	0.47	0.53	< 0.10	< 0.20	< 0.10	< 0.10	10.3	10.1	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Ft. Langley #2 well	12/02/2020	< 1.0	< 3.0		< 0.010	< 0.10	< 0.10	0.51	0.51					10.4	9.60		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Brookwood #10 well	06/17/2020																										

Sampling Point	Collection Date	Aluminum (dissolved)	Aluminum (total)	Ametryn	Anthracene	Antimony (dissolved)	Antimony (total)	Arsenic (dissolved)	Arsenic (total)	Atrazine	Atrazine + N-dealkylated metabolites	Atrazine-desethyl (DEA)	Azinphos-methyl	Barium (dissolved)	Barium (total)	Bendiocarb	Benzo(a)anthracene	Benzene	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzo(a)pyrene	Beryllium (dissolved)	Beryllium (total)	beta-BHC	Bismuth (dissolved)	Bismuth (total)	
Brookswood #10 well	06/19/2020																											
Brookswood #10 well	09/03/2020	< 1.0	< 3.0	< 0.10	< 0.010	< 0.10	< 0.10	2.11	2.24	< 0.10	< 0.20	< 0.10	< 0.10	14.6	14.7	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Brookswood #10 well	11/18/2020																											
Brookswood #10 well	12/02/2020	< 1.0	< 3.0		< 0.010	< 0.10	< 0.10	2.40	2.29					14.2	13.4		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Brookswood #7 well	09/03/2020	2.0	3.8	< 0.10	< 0.010	< 0.10	< 0.10	0.45	0.62	< 0.10	< 0.20	< 0.10	< 0.10	12.7	13.1	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Brookswood #7 well	11/18/2020																											
Brookswood #7 well	12/02/2020	4.0	6.3		< 0.010	< 0.10	< 0.10	0.53	0.57					11.8	11.4		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Brookswood #9 well	03/11/2020																											
Brookswood #9 well	06/17/2020																											
Brookswood #9 well	09/03/2020	< 1.0	< 3.0	< 0.10	< 0.010	< 0.10	< 0.10	0.90	1.18	< 0.10	< 0.20	< 0.10	< 0.10	9.53	10.0	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Brookswood #9 well	11/18/2020																											
Brookswood #9 well	12/02/2020	< 1.0	4.3		< 0.010	< 0.10	< 0.10	1.15	1.56					9.68	9.41		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Murrayville #1 well	03/11/2020																											
Murrayville #1 well	06/17/2020																											
Murrayville #1 well	09/03/2020	1.6	64.2	< 0.10	< 0.010	< 0.10	< 0.10	1.18	1.31	< 0.10	< 0.20	< 0.10	< 0.10	11.1	11.9	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Murrayville #1 well	11/18/2020																											
Murrayville #1 well	12/02/2020	1.4	10.7		< 0.010	< 0.10	< 0.10	1.14	1.09					10.2	9.68		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Murrayville #2 well	03/11/2020																											
Murrayville #2 well	06/17/2020																											
Murrayville #2 well	09/03/2020	1.2	< 3.0	< 0.10	< 0.010	< 0.10	< 0.10	2.00	2.16	< 0.10	< 0.20	< 0.10	< 0.10	30.3	30.5	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Murrayville #2 well	11/18/2020																											
Murrayville #2 well	12/02/2020	1.4	< 3.0		< 0.010	< 0.10	< 0.10	2.16	1.98					28.8	27.7		< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100		< 0.050	< 0.050
Tall Timber #1 well	03/11/2020																											
Tall Timber #1 well	06/17/2020																											
Tall Timber #1 well	09/03/2020	2.2	3.3	< 0.10	< 0.010	< 0.10	< 0.10	3.26	3.53	< 0.10	< 0.20	< 0.10	< 0.10	11.9	11.5	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Tall Timber #2 well	03/11/2020																											
Tall Timber #2 well	06/17/2020																											
Tall Timber #2 well	09/09/2020	1.4	< 3.0	< 0.10	< 0.010	< 0.10	< 0.10	3.27	3.34	< 0.10	< 0.20	< 0.10	< 0.10	9.68	10.1	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050
Tall Timber #3 well	03/11/2020																											
Tall Timber #3 well	06/17/2020																											
Tall Timber #3 well	09/03/2020	2.7	3.3	< 0.10	< 0.010	< 0.10	< 0.10	3.19	3.28	< 0.10	< 0.20	< 0.10	< 0.10	10.4	10.5	< 0.50	< 0.010	< 0.50	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0050	< 0.100	< 0.100	< 0.0080	< 0.050	< 0.050

Sampling Point	Collection Date	Boron (dissolved)	Boron (total)	Bromide	Bromoxynil	Cadmium (dissolved)	Cadmium (total)	Calcium (dissolved)	Carbaryl	Carbofuran	Carbon tetrachloride	Chlorate	Chloride	Chlorite	Chloroethane	Methyl chloride (Chloromethane)	Chlorpyrifos	Chromium (dissolved)	Chromium (total)	Chrysene	cis-1,2-Dichloroethylene	cis-1,3-Dichloropropene	Cobalt (dissolved)	Cobalt (total)	Copper (dissolved)	Copper (total)	Cyanazine	
		ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Acadia #1 well	03/11/2020																											
Acadia #1 well	06/17/2020																											
Acadia #1 well	09/03/2020	34	33	< 0.050	< 0.050	< 0.0050	< 0.0050	17.9	< 0.50	< 0.50	< 0.50	< 0.050	1.79	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	0.47	< 0.50	< 0.10	
Acadia #1 well	11/18/2020																											
Acadia #1 well	12/02/2020	33	33	< 0.050		< 0.0050	< 0.0050	12.8			< 0.50	< 0.050	1.70	< 0.050	< 0.50	< 0.50		< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	0.34	1.85		
Acadia #2 well	03/11/2020																											
Acadia #2 well	06/17/2020																											
Acadia #2 well	09/03/2020	32	34	< 0.050	< 0.050	< 0.0050	< 0.0050	16.0	< 0.50	< 0.50	< 0.50	< 0.050	1.89	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	0.23	< 0.50	< 0.10	
Acadia #2 well	11/18/2020																											
Acadia #2 well	12/02/2020	30	30	< 0.050		< 0.0050	< 0.0050	13.8			< 0.50	< 0.050	1.84	< 0.050	< 0.50	< 0.50		< 0.10	0.11	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	< 0.20	< 0.50		
Aldergrove #10 well	03/11/2020																											
Aldergrove #10 well	06/17/2020																											
Aldergrove #10 well	09/03/2020	62	67	< 0.050	< 0.050	0.0315	0.0278	36.8	< 0.50	< 0.50	< 0.50	< 0.050	5.81	< 0.050	< 0.50	< 0.50	< 0.10	0.90	0.92	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	1.59	1.76	< 0.10	
Aldergrove #10 well	11/18/2020																											
Aldergrove #10 well	12/02/2020	65	63	< 0.050		0.0256	0.0283	32.3			< 0.50	< 0.050	6.11	< 0.050	< 0.50	< 0.50		0.90	0.92	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	3.69	4.01		
Aldergrove #4 well	06/17/2020																											
Aldergrove #4 well	09/03/2020	18	18	< 0.050	< 0.050	0.0052	0.0060	57.3	< 0.50	< 0.50	< 0.50	< 0.050	8.87	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	0.76	0.92	< 0.10	
Aldergrove #4 well	11/18/2020																											
Aldergrove #4 well	12/02/2020	16	18	< 0.050		0.0094	0.0094	42.9			< 0.50	< 0.050	9.59	< 0.050	< 0.50	< 0.50		< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	1.08	1.01		
Aldergrove #6 well	03/11/2020																											
Aldergrove #6 well	09/03/2020	30	32	0.058	< 0.050	< 0.0050	< 0.0050	57.3	< 0.50	< 0.50	< 0.50	< 0.050	16.8	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	0.12	0.12	0.46	0.55	< 0.10	
Aldergrove #6 well	11/18/2020																											
Aldergrove #6 well	12/02/2020	28	30	< 0.050		< 0.0050	0.0051	45.0			< 0.50	< 0.050	16.8	< 0.050	< 0.50	< 0.50		< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	0.12	0.11	< 0.20	< 0.50		
Aldergrove #7 well	03/11/2020																											
Aldergrove #7 well	06/17/2020																											
Aldergrove #7 well	09/03/2020	25	28	0.051	< 0.050	0.0113	0.0130	59.6	< 0.50	< 0.50	< 0.50	< 0.050	10.6	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	1.60	1.68	< 0.10	
Aldergrove #7 well	12/02/2020	25	26	< 0.050		0.0237	0.0111	48.9			< 0.50	< 0.050	10.5	< 0.050	< 0.50	< 0.50		< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	1.47	1.50		
Aldergrove #8 well	03/11/2020																											
Aldergrove #8 well	06/17/2020																											
Aldergrove #8 well	09/03/2020	21	23	< 0.050	< 0.050	< 0.0050	< 0.0050	43.0	< 0.50	< 0.50	< 0.50	< 0.050	7.34	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	< 0.20	< 0.50	< 0.10	
Aldergrove #8 well	11/18/2020																											
Aldergrove #8 well	12/02/2020	21	21	< 0.050		< 0.0050	< 0.0050	34.7			< 0.50	< 0.050	7.54	< 0.050	< 0.50	< 0.50		< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	0.49	< 0.50		
Aldergrove #9 well	03/11/2020																											
Aldergrove #9 well	06/17/2020																											
Aldergrove #9 well	09/03/2020	14	15	0.073	< 0.050	0.0491	0.0468	42.7	< 0.50	< 0.50	< 0.50	< 0.050	8.28	< 0.050	< 0.50	< 0.50	< 0.10	0.28	0.28	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	8.18	8.91	< 0.10	
Aldergrove #9 well	11/18/2020																											
Aldergrove #9 well	12/02/2020	13	14	< 0.050		0.0453	0.0412	30.3			< 0.50	< 0.050	8.83	< 0.050	< 0.50	< 0.50		0.27	0.35	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	5.96	6.26		
Ft. Langley #2 well	09/03/2020	36	39	0.178	< 0.050	0.0139	0.0094	24.6	< 0.50	< 0.50	< 0.50	< 0.050	53.2	< 0.050	< 0.50	< 0.50	< 0.10	0.11	0.12	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	13.8	13.7	< 0.10	
Ft. Langley #2 well	12/02/2020	38	38	0.121		0.0215	0.0120	21.0			< 0.50	< 0.050	53.9	< 0.050	< 0.50	< 0.50		0.11	0.13	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	12.0	11.0		
Brookwood #10 well	06/17/2020																											

Sampling Point	Collection Date	Boron (dissolved)	Boron (total)	Bromide	Bromoxynil	Cadmium (dissolved)	Cadmium (total)	Calcium (dissolved)	Carbaryl	Carbofuran	Carbon tetrachloride	Chlorate	Chloride	Chlorite	Chloroethane	Methyl chloride (Chloromethane)	Chlorpyrifos	Chromium (dissolved)	Chromium (total)	Chrysene	cis-1,2-Dichloroethylene	cis-1,3-Dichloropropane	Cobalt (dissolved)	Cobalt (total)	Copper (dissolved)	Copper (total)	Cyanazine	
Brookwood #10 well	06/19/2020																											
Brookwood #10 well	09/03/2020	10	12	< 0.050	< 0.050	0.0103	0.0144	40.9	< 0.50	< 0.50	< 0.50	< 0.050	7.69	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	0.14	0.12	0.40	0.77	< 0.10	
Brookwood #10 well	11/18/2020																											
Brookwood #10 well	12/02/2020	11	11	< 0.050		0.0099	0.0141	38.9			< 0.50	< 0.050	6.25	< 0.050	< 0.50	< 0.50		< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	0.13	0.13	0.53	0.78		
Brookwood #7 well	09/03/2020	19	20	0.055	< 0.050	0.0730	0.0666	23.4	< 0.50	< 0.50	< 0.50	< 0.050	19.7	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	0.34	0.36	3.70	3.65	< 0.10	
Brookwood #7 well	11/18/2020																											
Brookwood #7 well	12/02/2020	19	19	< 0.050		0.0628	0.0716	19.2			< 0.50	< 0.050	19.4	< 0.050	< 0.50	< 0.50		< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	0.38	0.36	2.30	2.54		
Brookwood #9 well	03/11/2020																											
Brookwood #9 well	06/17/2020																											
Brookwood #9 well	09/03/2020	17	18	< 0.050	< 0.050	0.0608	0.0679	23.9	< 0.50	< 0.50	< 0.50	< 0.050	17.0	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	0.68	0.68	12.6	15.4	< 0.10	
Brookwood #9 well	11/18/2020																											
Brookwood #9 well	12/02/2020	18	18	< 0.050		0.0776	0.103	20.6			< 0.50	< 0.050	17.2	< 0.050	< 0.50	< 0.50		< 0.10	0.17	< 0.010	< 0.50	< 0.50	0.89	0.82	1.17	4.25		
Murrayville #1 well	03/11/2020																											
Murrayville #1 well	06/17/2020																											
Murrayville #1 well	09/03/2020	30	32	< 0.050	< 0.050	< 0.0050	< 0.0050	14.3	< 0.50	< 0.50	< 0.50	< 0.050	1.73	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	0.13	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	0.26	0.91	< 0.10	
Murrayville #1 well	11/18/2020																											
Murrayville #1 well	12/02/2020	27	28	< 0.050		< 0.0050	< 0.0050	12.4			< 0.50	< 0.050	1.62	< 0.050	< 0.50	< 0.50		< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	0.33	< 0.50		
Murrayville #2 well	03/11/2020																											
Murrayville #2 well	06/17/2020																											
Murrayville #2 well	09/03/2020	< 10	< 10	< 0.050	< 0.050	< 0.0050	< 0.0050	12.4	< 0.50	< 0.50	< 0.50	< 0.050	2.54	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	< 0.20	< 0.50	< 0.10	
Murrayville #2 well	11/18/2020																											
Murrayville #2 well	12/02/2020	< 10	< 10	< 0.050		0.0229	< 0.0050	10.7			< 0.50	< 0.050	2.48	< 0.050	< 0.50	< 0.50		< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	1.02	0.62		
Tall Timber #1 well	03/11/2020																											
Tall Timber #1 well	06/17/2020																											
Tall Timber #1 well	09/03/2020	74	78	< 0.050	< 0.050	< 0.0050	< 0.0050	10.4	< 0.50	< 0.50	< 0.50	< 0.050	3.67	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	< 0.20	< 0.50	< 0.10	
Tall Timber #2 well	03/11/2020																											
Tall Timber #2 well	06/17/2020																											
Tall Timber #2 well	09/09/2020	66	73	< 0.050	< 0.050	< 0.0050	< 0.0050	8.93	< 0.50	< 0.50	< 0.50	< 0.050	4.15	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	< 0.20	0.67	< 0.10	
Tall Timber #3 well	03/11/2020																											
Tall Timber #3 well	06/17/2020																											
Tall Timber #3 well	09/03/2020	68	71	< 0.050	< 0.050	< 0.0050	< 0.0050	10.4	< 0.50	< 0.50	< 0.50	< 0.050	3.69	< 0.050	< 0.50	< 0.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.50	< 0.50	< 0.10	< 0.10	< 0.20	< 0.50	< 0.10	

Sampling Point	Collection Date	Cyanide (total)	delta-BHC	Diazinon	Dibenzo(a,h)anthracene	Dicamba	Dichloromethane	Diclofop-methyl	Dieldrin	Dimethoate	Dinoseb	Diquat	Dissolved Organic Carbon	Diuron	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Ethylbenzene	Fluoranthene	Fluorene	Fluoride	Total Chlordane3
		mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L
Acadia #1 well	03/11/2020																							
Acadia #1 well	06/17/2020																							
Acadia #1 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	0.52	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.143	< 0.0080
Acadia #1 well	11/18/2020																							
Acadia #1 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						0.74							< 0.50	< 0.010	< 0.010	0.134	
Acadia #2 well	03/11/2020																							
Acadia #2 well	06/17/2020																							
Acadia #2 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	0.88	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.138	< 0.0080
Acadia #2 well	11/18/2020																							
Acadia #2 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						< 0.50							< 0.50	< 0.010	< 0.010	0.123	
Aldergrove #10 well	03/11/2020																							
Aldergrove #10 well	06/17/2020																							
Aldergrove #10 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	0.72	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	< 0.020	< 0.0080
Aldergrove #10 well	11/18/2020																							
Aldergrove #10 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						0.75							< 0.50	< 0.010	< 0.010	0.021	
Aldergrove #4 well	06/17/2020																							
Aldergrove #4 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	0.68	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.064	< 0.0080
Aldergrove #4 well	11/18/2020																							
Aldergrove #4 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						0.86							< 0.50	< 0.010	< 0.010	0.066	
Aldergrove #6 well	03/11/2020																							
Aldergrove #6 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	1.09	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.036	< 0.0080
Aldergrove #6 well	11/18/2020																							
Aldergrove #6 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						1.29							< 0.50	< 0.010	< 0.010	0.035	
Aldergrove #7 well	03/11/2020																							
Aldergrove #7 well	06/17/2020																							
Aldergrove #7 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	1.24	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.027	< 0.0080
Aldergrove #7 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						0.93							< 0.50	< 0.010	< 0.010	0.028	
Aldergrove #8 well	03/11/2020																							
Aldergrove #8 well	06/17/2020																							
Aldergrove #8 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	0.56	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.053	< 0.0080
Aldergrove #8 well	11/18/2020																							
Aldergrove #8 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						0.80							< 0.50	< 0.010	< 0.010	0.052	
Aldergrove #9 well	03/11/2020																							
Aldergrove #9 well	06/17/2020																							
Aldergrove #9 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	1.64	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	< 0.020	< 0.0080
Aldergrove #9 well	11/18/2020																							
Aldergrove #9 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						1.58							< 0.50	< 0.010	< 0.010	< 0.020	
Ft. Langley #2 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	0.56	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.038	< 0.0080
Ft. Langley #2 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						0.96							< 0.50	< 0.010	< 0.010	0.039	
Brookwood #10 well	06/17/2020																							

Sampling Point	Collection Date	Cyanide (total)	delta-BHC	Diazinon	Dibenzo(a,h)anthracene	Dicamba	Dichloromethane	Diclofop-methyl	Dieldrin	Dimethoate	Dinoseb	Diquat	Dissolved Organic Carbon	Diuron	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Ethylbenzene	Fluoranthene	Fluorene	Fluoride	Total Chlordane3
Brookwood #10 well	06/19/2020																							
Brookwood #10 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	0.92	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.061	< 0.0080
Brookwood #10 well	11/18/2020																							
Brookwood #10 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						0.99							< 0.50	< 0.010	< 0.010	0.055	
Brookwood #7 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	1.14	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.061	< 0.0080
Brookwood #7 well	11/18/2020																							
Brookwood #7 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						1.07							< 0.50	< 0.010	< 0.010	0.058	
Brookwood #9 well	03/11/2020																							
Brookwood #9 well	06/17/2020																							
Brookwood #9 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	1.46	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.061	< 0.0080
Brookwood #9 well	11/18/2020																							
Brookwood #9 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						0.92							< 0.50	< 0.010	< 0.010	0.058	
Murrayville #1 well	03/11/2020																							
Murrayville #1 well	06/17/2020																							
Murrayville #1 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	1.31	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.160	< 0.0080
Murrayville #1 well	11/18/2020																							
Murrayville #1 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						< 0.50							< 0.50	< 0.010	< 0.010	0.154	
Murrayville #2 well	03/11/2020																							
Murrayville #2 well	06/17/2020																							
Murrayville #2 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	0.60	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.108	< 0.0080
Murrayville #2 well	11/18/2020																							
Murrayville #2 well	12/02/2020	< 0.0050			< 0.0050		< 0.50						0.51							< 0.50	< 0.010	< 0.010	0.110	
Tall Timber #1 well	03/11/2020																							
Tall Timber #1 well	06/17/2020																							
Tall Timber #1 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	0.85	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.217	< 0.0080
Tall Timber #2 well	03/11/2020																							
Tall Timber #2 well	06/17/2020																							
Tall Timber #2 well	09/09/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	0.85	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.217	< 0.0080
Tall Timber #3 well	03/11/2020																							
Tall Timber #3 well	06/17/2020																							
Tall Timber #3 well	09/03/2020	< 0.0050	< 0.0080	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.10	< 0.0080	< 0.10	< 0.050	< 1.0	0.84	< 1.0	< 0.0070	< 0.0070	< 0.0070	< 0.010	< 0.010	< 0.50	< 0.010	< 0.010	0.207	< 0.0080

Sampling Point	Collection Date	gamma-Hexachlorocyclohexane	Glyphosate	Gross alpha particle activity	Gross alpha particle activity <sup>4</sup>	Gross beta particle activity	Gross beta particle activity <sup>5</sup>	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Indeno(1,2,3-c,d)pyrene	Iron (dissolved)	Iron (total)	Lead (dissolved)	Lead (total)	Lithium (dissolved)	Lithium (total)	m- + p- Xylene	Magnesium (dissolved)	Malathion	Manganese (dissolved)	Manganese (total)	2-methyl-4-chlorophenoxyacetic acid / MCPA	Mercury (dissolved)	Mercury (total)	Methoxychlor	
		ug/L	ug/L	Bq/L	Bq/m <sup>3</sup>	Bq/L	Bq/m <sup>3</sup>	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
Acadia #1 well	03/11/2020																										
Acadia #1 well	06/17/2020																										
Acadia #1 well	09/03/2020	< 0.0080	< 0.20	< 0.08		< 0.12		< 0.0080	< 0.0080	< 0.0080	< 0.010	15	23	< 0.050	< 0.050	< 1.0	< 1.0	< 0.50	8.15	< 0.10	118	117	< 0.050	< 0.0050	< 0.0050	< 0.0080	
Acadia #1 well	11/18/2020																										
Acadia #1 well	12/02/2020										< 0.010	24	244	< 0.050	0.084	< 1.0	< 1.0	< 0.50	6.54		115	119		< 0.0050	< 0.0050		
Acadia #2 well	03/11/2020																										
Acadia #2 well	06/17/2020																										
Acadia #2 well	09/03/2020	< 0.0080	< 0.20	< 0.054		0.091		< 0.0080	< 0.0080	< 0.0080	< 0.010	12	32	< 0.050	< 0.050	< 1.0	< 1.0	< 0.50	8.45	< 0.10	125	123	< 0.050	< 0.0050	< 0.0050	< 0.0080	
Acadia #2 well	11/18/2020																										
Acadia #2 well	12/02/2020										< 0.010	16	22	< 0.050	< 0.050	< 1.0	< 1.0	< 0.50	6.60		125	117		< 0.0050	< 0.0050		
Aldergrove #10 well	03/11/2020																										
Aldergrove #10 well	06/17/2020																										
Aldergrove #10 well	09/03/2020	< 0.0080	< 0.20	< 0.077		< 0.12		< 0.0080	< 0.0080	< 0.0080	< 0.010	< 10	< 10	< 0.050	< 0.050	1.1	1.2	< 0.50	10.9	< 0.10	0.40	0.43	< 0.050	< 0.0050	< 0.0050	< 0.0080	
Aldergrove #10 well	11/18/2020																										
Aldergrove #10 well	12/02/2020										< 0.010	< 10	< 10	< 0.050	< 0.050	1.2	1.1	< 0.50	8.27		0.39	0.46		< 0.0050	< 0.0050		
Aldergrove #4 well	06/17/2020																										
Aldergrove #4 well	09/03/2020	< 0.0080	< 0.20		< 74		160	< 0.0080	< 0.0080	< 0.0080	< 0.010	150	198	0.068	0.138	4.5	4.3	< 0.50	17.7	< 0.10	538	456	< 0.050	< 0.0050	< 0.0050	< 0.0080	
Aldergrove #4 well	11/18/2020																										
Aldergrove #4 well	12/02/2020										< 0.010	179	185	0.057	0.070	4.1	4.4	< 0.50	13.7		437	461		< 0.0050	< 0.0050		
Aldergrove #6 well	03/11/2020																										
Aldergrove #6 well	09/03/2020	< 0.0080	< 0.20		< 77		190	< 0.0080	< 0.0080	< 0.0080	< 0.010	58	72	< 0.050	< 0.050	5.2	5.2	< 0.50	15.8	< 0.10	183	180	< 0.050	< 0.0050	< 0.0050	< 0.0080	
Aldergrove #6 well	11/18/2020																										
Aldergrove #6 well	12/02/2020										< 0.010	60	62	< 0.050	< 0.050	5.1	5.2	< 0.50	13.0		183	174		< 0.0050	< 0.0050		
Aldergrove #7 well	03/11/2020																										
Aldergrove #7 well	06/17/2020																										
Aldergrove #7 well	09/03/2020	< 0.0080	< 0.20		< 84		220	< 0.0080	< 0.0080	< 0.0080	< 0.010	36	44	< 0.050	< 0.050	5.2	5.3	< 0.50	20.4	< 0.10	156	151	< 0.050	< 0.0050	< 0.0050	< 0.0080	
Aldergrove #7 well	12/02/2020										< 0.010	43	44	< 0.050	< 0.050	5.1	5.2	< 0.50	15.5		146	142		< 0.0050	< 0.0050		
Aldergrove #8 well	03/11/2020																										
Aldergrove #8 well	06/17/2020																										
Aldergrove #8 well	09/03/2020	< 0.0080	< 0.20		< 58		140	< 0.0080	< 0.0080	< 0.0080	< 0.010	71	90	< 0.050	< 0.050	3.2	3.3	< 0.50	16.4	< 0.10	199	193	< 0.050	< 0.0050	< 0.0050	< 0.0080	
Aldergrove #8 well	11/18/2020																										
Aldergrove #8 well	12/02/2020										< 0.010	84	82	< 0.050	< 0.050	3.1	3.2	< 0.50	12.5		186	182		< 0.0050	< 0.0050		
Aldergrove #9 well	03/11/2020																										
Aldergrove #9 well	06/17/2020																										
Aldergrove #9 well	09/03/2020	< 0.0080	< 0.20	< 0.058		0.1		< 0.0080	< 0.0080	< 0.0080	< 0.010	< 10	< 10	0.279	0.295	< 1.0	< 1.0	< 0.50	13.8	< 0.10	1.86	2.01	< 0.050	0.0054	0.0093	< 0.0080	
Aldergrove #9 well	11/18/2020																										
Aldergrove #9 well	12/02/2020										< 0.010	< 10	< 10	0.182	0.206	< 1.0	< 1.0	< 0.50	10.8		1.62	1.72		< 0.0050	0.0050		
Ft. Langley #2 well	09/03/2020	< 0.0080	< 0.20	< 0.077		0.1		< 0.0080	< 0.0080	< 0.0080	< 0.010	< 10	< 10	0.455	0.429	< 1.0	< 1.0	< 0.50	10.5	< 0.10	6.68	6.34	< 0.050	< 0.0050	< 0.0050	< 0.0080	
Ft. Langley #2 well	12/02/2020										< 0.010	< 10	< 10	0.439	0.410	< 1.0	< 1.0	< 0.50	8.84		6.64	6.54		< 0.0050	< 0.0050		
Brookwood #10 well	06/17/2020																										

Sampling Point	Collection Date	gamma-Hexachlorocyclohexane	Glyphosate	Gross alpha particle activity	Gross alpha particle activity4	Gross beta particle activity	Gross beta particle activity5	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Indeno(1,2,3-c,d)pyrene	Iron (dissolved)	Iron (total)	Lead (dissolved)	Lead (total)	Lithium (dissolved)	Lithium (total)	m- + p- Xylene	Magnesium (dissolved)	Malathion	Manganese (dissolved)	Manganese (total)	2-methyl-4-chlorophenoxyacetic acid / MCPA	Mercury (dissolved)	Mercury (total)	Methoxychlor
Brookwood #10 well	06/19/2020																									
Brookwood #10 well	09/03/2020	< 0.0080	< 0.20	< 0.088		< 0.093		< 0.0080	< 0.0080	< 0.0080	< 0.010	77	110	< 0.050	< 0.050	< 1.0	< 1.0	< 0.50	8.46	< 0.10	275	290	< 0.050	< 0.0050	< 0.0050	< 0.0080
Brookwood #10 well	11/18/2020																									
Brookwood #10 well	12/02/2020										< 0.010	105	136	< 0.050	< 0.050	< 1.0	< 1.0	< 0.50	6.56		298	317		< 0.0050	< 0.0050	
Brookwood #7 well	09/03/2020	< 0.0080	< 0.20	< 0.05		< 0.071		< 0.0080	< 0.0080	< 0.0080	< 0.010	389	414	1.03	1.25	1.0	1.0	< 0.50	6.03	< 0.10	656	627	< 0.050	< 0.0050	< 0.0050	< 0.0080
Brookwood #7 well	11/18/2020																									
Brookwood #7 well	12/02/2020										< 0.010	334	348	1.04	1.22	1.0	1.0	< 0.50	4.46		571	568		< 0.0050	< 0.0050	
Brookwood #9 well	03/11/2020																									
Brookwood #9 well	06/17/2020																									
Brookwood #9 well	09/03/2020	< 0.0080	< 0.20	< 0.069		< 0.092		< 0.0080	< 0.0080	< 0.0080	< 0.010	268	371	2.27	3.11	1.3	1.4	< 0.50	7.32	< 0.10	386	411	< 0.050	< 0.0050	< 0.0050	< 0.0080
Brookwood #9 well	11/18/2020																									
Brookwood #9 well	12/02/2020										< 0.010	863	974	< 0.050	0.426	1.4	1.3	< 0.50	6.05		536	522		< 0.0050	0.0069	
Murrayville #1 well	03/11/2020																									
Murrayville #1 well	06/17/2020																									
Murrayville #1 well	09/03/2020	< 0.0080	< 0.20	< 0.076		< 0.093		< 0.0080	< 0.0080	< 0.0080	< 0.010	27	110	< 0.050	0.072	< 1.0	< 1.0	< 0.50	7.21	< 0.10	96.3	96.6	< 0.050	< 0.0050	< 0.0050	< 0.0080
Murrayville #1 well	11/18/2020																									
Murrayville #1 well	12/02/2020										< 0.010	34	57	0.056	0.102	< 1.0	< 1.0	< 0.50	5.41		90.7	89.0		< 0.0050	< 0.0050	
Murrayville #2 well	03/11/2020																									
Murrayville #2 well	06/17/2020																									
Murrayville #2 well	09/03/2020	< 0.0080	< 0.20	< 0.071		< 0.095		< 0.0080	< 0.0080	< 0.0080	< 0.010	172	236	< 0.050	< 0.050	< 1.0	< 1.0	< 0.50	6.61	< 0.10	96.4	94.8	< 0.050	< 0.0050	< 0.0050	< 0.0080
Murrayville #2 well	11/18/2020																									
Murrayville #2 well	12/02/2020										< 0.010	203	232	0.060	< 0.050	< 1.0	< 1.0	< 0.50	5.22		90.8	89.3		< 0.0050	< 0.0050	
Tall Timber #1 well	03/11/2020																									
Tall Timber #1 well	06/17/2020																									
Tall Timber #1 well	09/03/2020	< 0.0080	< 0.20	< 0.073		0.12		< 0.0080	< 0.0080	< 0.0080	< 0.010	21	27	< 0.050	< 0.050	< 1.0	< 1.0	< 0.50	5.25	< 0.10	47.4	46.2	< 0.050	< 0.0050	< 0.0050	< 0.0080
Tall Timber #2 well	03/11/2020																									
Tall Timber #2 well	06/17/2020																									
Tall Timber #2 well	09/09/2020	< 0.0080	< 0.20	< 0.077		0.15		< 0.0080	< 0.0080	< 0.0080	< 0.010	15	15	< 0.050	< 0.050	< 1.0	< 1.0	< 0.50	3.92	< 0.10	45.6	47.2	< 0.050	< 0.0050	< 0.0050	< 0.0080
Tall Timber #3 well	03/11/2020																									
Tall Timber #3 well	06/17/2020																									
Tall Timber #3 well	09/03/2020	< 0.0080	< 0.20	< 0.057		0.13		< 0.0080	< 0.0080	< 0.0080	< 0.010	14	22	< 0.050	< 0.050	< 1.0	< 1.0	< 0.50	5.72	< 0.10	48.2	48.5	< 0.050	< 0.0050	< 0.0050	< 0.0080

Sampling Point	Collection Date	Methyl parathion	Methyl tert-butyl ether / MTBE	Metolachlor	Metribuzin	Mirex	Molybdenum (dissolved)	Molybdenum (total)	Chlorobenzene	Naphthalene	Nickel (dissolved)	Nickel (total)	Nitrate (as N)	Nitriotriacetic acid / NTA	Nitrite (as N)	o,p-DDD	o,p-DDE	o-Xylene	Oxychlorane	Paraquat	Parathion	Pentachloronitrobenzene / PCNB	Pentachlorophenol / PCP	Phenanthrene	Phorate	Phosphorus (total)
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L
Acadia #1 well	03/11/2020																									
Acadia #1 well	06/17/2020																									
Acadia #1 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	2.05	1.96	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	0.0012	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.332**
Acadia #1 well	11/18/2020																									
Acadia #1 well	12/02/2020		< 0.50				2.10	1.84	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	< 0.0010			< 0.50						< 0.020		0.320**
Acadia #2 well	03/11/2020																									
Acadia #2 well	06/17/2020																									
Acadia #2 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	2.01	2.06	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	< 0.0010	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.316**
Acadia #2 well	11/18/2020																									
Acadia #2 well	12/02/2020		< 0.50				1.82	1.86	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	< 0.0010			< 0.50						< 0.020		0.288**
Aldergrove #10 well	03/11/2020																									
Aldergrove #10 well	06/17/2020																									
Aldergrove #10 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	0.111	0.110	< 0.50	< 0.050	1.45	1.49	13.7	< 0.20	0.0063	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.0124
Aldergrove #10 well	11/18/2020																									
Aldergrove #10 well	12/02/2020		< 0.50				0.157	0.109	< 0.50	< 0.050	1.49	1.60	13.6	< 0.20	0.0034			< 0.50						< 0.020		0.0123
Aldergrove #4 well	06/17/2020																									
Aldergrove #4 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	0.795	0.813	< 0.50	< 0.050	0.70	0.67	0.734	< 0.20	0.0608	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.0061
Aldergrove #4 well	11/18/2020																									
Aldergrove #4 well	12/02/2020		< 0.50				0.664	0.717	< 0.50	< 0.050	0.67	0.71	0.663	< 0.20	0.0621			< 0.50						< 0.020		0.0050
Aldergrove #6 well	03/11/2020																									
Aldergrove #6 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	0.740	0.762	< 0.50	< 0.050	0.70	0.73	0.203	< 0.20	0.0383	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.0063
Aldergrove #6 well	11/18/2020																									
Aldergrove #6 well	12/02/2020		< 0.50				0.743	0.751	< 0.50	< 0.050	0.78	0.81	0.294	< 0.20	0.0583			< 0.50						< 0.020		0.0067
Aldergrove #7 well	03/11/2020																									
Aldergrove #7 well	06/17/2020																									
Aldergrove #7 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	1.29	1.30	< 0.50	< 0.050	1.95	1.87	1.26	< 0.20	0.147	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.0079
Aldergrove #7 well	12/02/2020		< 0.50				1.36	1.33	< 0.50	< 0.050	1.80	1.88	1.06	< 0.20	0.151			< 0.50						< 0.020		0.0084
Aldergrove #8 well	03/11/2020																									
Aldergrove #8 well	06/17/2020																									
Aldergrove #8 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	2.01	2.05	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	< 0.0010	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.0140
Aldergrove #8 well	11/18/2020																									
Aldergrove #8 well	12/02/2020		< 0.50				1.90	1.82	< 0.50	< 0.050	0.51	< 0.50	< 0.0050	< 0.20	< 0.0010			< 0.50						< 0.020		0.0104
Aldergrove #9 well	03/11/2020																									
Aldergrove #9 well	06/17/2020																									
Aldergrove #9 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	0.052	< 0.050	< 0.50	< 0.050	0.81	0.83	8.27	< 0.20	0.0015	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.0122
Aldergrove #9 well	11/18/2020																									
Aldergrove #9 well	12/02/2020		< 0.50				0.052	0.063	< 0.50	< 0.050	0.74	0.82	7.41	< 0.20	< 0.0010			< 0.50						< 0.020		0.0109
Ft. Langley #2 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	0.448	0.454	< 0.50	< 0.050	< 0.50	< 0.50	4.71	< 0.20	< 0.0010	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.0268
Ft. Langley #2 well	12/02/2020		< 0.50				0.447	0.460	< 0.50	< 0.050	< 0.50	< 0.50	4.15	< 0.20	< 0.0010			< 0.50						< 0.020		0.0274
Brookwood #10 well	06/17/2020																									

Sampling Point	Collection Date	Methyl parathion	Methyl tert-butyl ether / MTBE	Metolachlor	Metribuzin	Mirex	Molybdenum (dissolved)	Molybdenum (total)	Chlorobenzene	Naphthalene	Nickel (dissolved)	Nickel (total)	Nitrate (as N)	Nitrotriacetic acid / NTA	Nitrite (as N)	o,p-DDD	o,p-DDE	o-Xylene	Oxychlorane	Paraquat	Parathion	Pentachloronitrobenzene / PCNB	Pentachlorophenol / PCP	Phenanthrene	Phorate	Phosphorus (total)
Brookswood #10 well	06/19/2020																									
Brookswood #10 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	1.41	1.46	< 0.50	< 0.050	0.56	0.53	< 0.0050	< 0.20	< 0.0010	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.0492**
Brookswood #10 well	11/18/2020																									
Brookswood #10 well	12/02/2020		< 0.50				1.29	1.32	< 0.50	< 0.050	0.53	0.53	< 0.0050	< 0.20	< 0.0010			< 0.50						< 0.020		0.0498**
Brookswood #7 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	0.868	0.926	< 0.50	< 0.050	16.8	17.9	0.0314	< 0.20	0.0011	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.0540**
Brookswood #7 well	11/18/2020																									
Brookswood #7 well	12/02/2020		< 0.50				0.765	0.764	< 0.50	< 0.050	17.2	16.7	0.0205	< 0.20	< 0.0010			< 0.50						< 0.020		0.0502**
Brookswood #9 well	03/11/2020																									
Brookswood #9 well	06/17/2020																									
Brookswood #9 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	1.08	1.04	< 0.50	< 0.050	15.4	15.9	0.152	< 0.20	< 0.0010	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.0638**
Brookswood #9 well	11/18/2020																									
Brookswood #9 well	12/02/2020		< 0.50				1.31	1.22	< 0.50	< 0.050	17.1	16.0	0.0513	< 0.20	< 0.0010			< 0.50						< 0.020		0.0938**
Murrayville #1 well	03/11/2020																									
Murrayville #1 well	06/17/2020																									
Murrayville #1 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	2.35	2.31	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	0.0013	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.236**
Murrayville #1 well	11/18/2020																									
Murrayville #1 well	12/02/2020		< 0.50				2.18	2.04	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	< 0.0010			< 0.50						< 0.020		0.214**
Murrayville #2 well	03/11/2020																									
Murrayville #2 well	06/17/2020																									
Murrayville #2 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	0.861	0.849	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	< 0.0010	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.1072**
Murrayville #2 well	11/18/2020																									
Murrayville #2 well	12/02/2020		< 0.50				0.833	0.801	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	< 0.0010			< 0.50						< 0.020		0.1040**
Tall Timber #1 well	03/11/2020																									
Tall Timber #1 well	06/17/2020																									
Tall Timber #1 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	3.73	3.89	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	< 0.0010	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.524**
Tall Timber #2 well	03/11/2020																									
Tall Timber #2 well	06/17/2020																									
Tall Timber #2 well	09/09/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	3.01	3.06	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	< 0.0010	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.518**
Tall Timber #3 well	03/11/2020																									
Tall Timber #3 well	06/17/2020																									
Tall Timber #3 well	09/03/2020	< 0.10	< 0.50	< 0.10	< 1.0	< 0.0080	3.56	3.59	< 0.50	< 0.050	< 0.50	< 0.50	< 0.0050	< 0.20	< 0.0010	< 0.0040	< 0.0040	< 0.50	< 0.0080	< 1.0	< 0.10	< 0.010	< 0.50	< 0.020	< 0.10	0.477**

Sampling Point	Collection Date	Picloram	Potassium (dissolved)	Prometon	Prometryn	Propazine	Pyrene	Quinoline	Selenium (dissolved)	Selenium (total)	Silicon (dissolved, as Si)	Silicon (total, as Si)	Silver (dissolved)	Silver (total)	Simazine	Sodium (dissolved)	Strontium (dissolved)	Strontium (total)	Styrene	Sulfur (dissolved)	Sulfur (total)	Sulphate	Sulphide (total, as S)	Temephos	Terbufos	Terbutryn	Tetrachloroethylene / PCE	
		ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	
Acadia #1 well	03/11/2020																											
Acadia #1 well	06/17/2020																											
Acadia #1 well	09/03/2020	< 0.10	2.86	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	< 0.050	< 0.050	12,200	12,200	< 0.010	< 0.010	< 0.10	19.4	75.2	64.3	< 0.50	1.22	1.77	5.02	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50	
Acadia #1 well	11/18/2020																											
Acadia #1 well	12/02/2020		2.80				< 0.010	< 0.050	< 0.050	< 0.050	11,200	11,900	< 0.010	< 0.010		16.2	63.4	61.4	< 0.50	1.51	1.19	4.83	< 0.018				< 0.50	
Acadia #2 well	03/11/2020																											
Acadia #2 well	06/17/2020																											
Acadia #2 well	09/03/2020	< 0.10	2.91	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	< 0.050	< 0.050	12,100	12,300	< 0.010	< 0.010	< 0.10	19.7	75.7	67.1	< 0.50	1.43	1.93	5.84	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50	
Acadia #2 well	11/18/2020																											
Acadia #2 well	12/02/2020		2.83				< 0.010	< 0.050	< 0.050	< 0.050	11,500	12,000	< 0.020	< 0.010		15.3	62.8	61.8	< 0.50	2.17	1.68	5.88	< 0.018				< 0.50	
Aldergrove #10 well	03/11/2020																											
Aldergrove #10 well	06/17/2020																											
Aldergrove #10 well	09/03/2020	< 0.10	1.06	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	0.145	0.160	10,200	10,500	< 0.010	< 0.010	< 0.10	8.12	211	187	< 0.50	10.7	11.9	34.3	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50	
Aldergrove #10 well	11/18/2020																											
Aldergrove #10 well	12/02/2020		0.972				< 0.010	< 0.050	0.143	0.172	10,200	10,300	< 0.010	< 0.010		5.89	179	177	< 0.50	12.4	11.7	34.3	< 0.018				< 0.50	
Aldergrove #4 well	06/17/2020																											
Aldergrove #4 well	09/03/2020	< 0.10	4.77	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	0.238	0.218	8,420	8,700	< 0.010	< 0.010	< 0.10	10.5	215	192	< 0.50	6.97	7.80	21.6	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50	
Aldergrove #4 well	11/18/2020																											
Aldergrove #4 well	12/02/2020		4.55				< 0.010	< 0.050	0.254	0.238	7,940	8,420	< 0.010	< 0.010		8.02	187	177	< 0.50	7.05	7.22	20.9	< 0.018				< 0.50	
Aldergrove #6 well	03/11/2020																											
Aldergrove #6 well	09/03/2020	< 0.10	6.02	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	0.074	0.068	7,270	7,590	< 0.010	< 0.010	< 0.10	21.7	223	196	< 0.50	13.7	15.8	42.0	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50	
Aldergrove #6 well	11/18/2020																											
Aldergrove #6 well	12/02/2020		5.17				< 0.010	< 0.050	0.060	0.053	6,670	7,090	< 0.010	< 0.010		17.1	196	182	< 0.50	14.2	14.8	41.9	< 0.018				< 0.50	
Aldergrove #7 well	03/11/2020																											
Aldergrove #7 well	06/17/2020																											
Aldergrove #7 well	09/03/2020	< 0.10	6.16	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	0.210	0.173	6,570	6,810	< 0.010	< 0.010	< 0.10	16.0	244	205	< 0.50	18.2	20.6	56.4	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50	
Aldergrove #7 well	12/02/2020		5.00				< 0.010	< 0.050	0.198	0.223	5,950	6,360	< 0.010	< 0.010		12.0	211	196	< 0.50	18.4	19.8	55.4	< 0.018				< 0.50	
Aldergrove #8 well	03/11/2020																											
Aldergrove #8 well	06/17/2020																											
Aldergrove #8 well	09/03/2020	< 0.10	3.74	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	< 0.050	< 0.050	7,630	7,750	< 0.010	< 0.010	< 0.10	16.5	165	136	< 0.50	11.6	12.3	34.9	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50	
Aldergrove #8 well	11/18/2020																											
Aldergrove #8 well	12/02/2020		3.48				< 0.010	< 0.050	< 0.050	< 0.050	7,080	7,330	< 0.010	< 0.010		11.9	142	132	< 0.50	10.6	11.1	32.2	< 0.018				< 0.50	
Aldergrove #9 well	03/11/2020																											
Aldergrove #9 well	06/17/2020																											
Aldergrove #9 well	09/03/2020	< 0.10	1.21	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	0.088	0.080	10,500	10,700	< 0.010	< 0.010	< 0.10	8.96	282	252	< 0.50	11.2	12.6	35.2	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50	
Aldergrove #9 well	11/18/2020																											
Aldergrove #9 well	12/02/2020		1.15				< 0.010	< 0.050	0.061	0.082	9,350	10,100	< 0.010	< 0.010		6.99	232	230	< 0.50	11.9	12.0	35.0	< 0.018				< 0.50	
Ft. Langley #2 well	09/03/2020	< 0.10	2.41	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	0.064	0.052	8,590	9,120	< 0.010	< 0.010	< 0.10	41.7	189	156	< 0.50	4.64	5.48	15.5	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50	
Ft. Langley #2 well	12/02/2020		2.27				< 0.010	< 0.050	< 0.050	0.061	8,920	8,680	< 0.010	< 0.010		32.4	154	150	< 0.50	5.44	5.30	15.2	< 0.018				< 0.50	
Brookwood #10 well	06/17/2020																											

Sampling Point	Collection Date	Picloram	Potassium (dissolved)	Prometon	Prometryn	Propazine	Pyrene	Quinoline	Selenium (dissolved)	Selenium (total)	Silicon (dissolved, as Si)	Silicon (total, as Si)	Silver (dissolved)	Silver (total)	Simazine	Sodium (dissolved)	Strontium (dissolved)	Strontium (total)	Styrene	Sulfur (dissolved)	Sulfur (total)	Sulphate	Sulphide (total, as S)	Temephos	Terbufos	Terbutryn	Tetrachloroethylene / PCE
Brookwood #10 well	06/19/2020																										
Brookwood #10 well	09/03/2020	< 0.10	1.50	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	< 0.050	< 0.050	8,710	9,160	< 0.010	< 0.010	< 0.10	8.35	185	160	< 0.50	6.12	7.04	20.0	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50
Brookwood #10 well	11/18/2020																										
Brookwood #10 well	12/02/2020		1.46				< 0.010	< 0.050	< 0.050	< 0.050	9,380	9,080	< 0.010	< 0.010		6.49	156	151	< 0.50	6.04	5.04	15.3	< 0.018				< 0.50
Brookwood #7 well	09/03/2020	< 0.10	1.61	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	< 0.050	< 0.050	8,480	8,660	< 0.010	< 0.010	< 0.10	20.2	150	134	< 0.50	9.37	10.3	29.6	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50
Brookwood #7 well	11/18/2020																										
Brookwood #7 well	12/02/2020		1.44				< 0.010	< 0.050	< 0.050	< 0.050	8,050	8,160	< 0.010	< 0.010		15.3	124	117	< 0.50	9.88	9.51	28.3	< 0.018				< 0.50
Brookwood #9 well	03/11/2020																										
Brookwood #9 well	06/17/2020																										
Brookwood #9 well	09/03/2020	< 0.10	2.35	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	< 0.050	< 0.050	11,000	11,300	< 0.010	< 0.010	< 0.10	16.7	129	110	< 0.50	10.7	12.0	34.1	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50
Brookwood #9 well	11/18/2020																										
Brookwood #9 well	12/02/2020		2.32				< 0.010	< 0.050	< 0.050	< 0.050	10,400	10,400	< 0.010	0.014		14.0	107	101	< 0.50	12.6	12.0	34.9	< 0.018				< 0.50
Murrayville #1 well	03/11/2020																										
Murrayville #1 well	06/17/2020																										
Murrayville #1 well	09/03/2020	< 0.10	2.21	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	< 0.050	< 0.050	13,400	13,800	< 0.010	< 0.010	< 0.10	19.4	76.2	67.2	< 0.50	< 0.50	< 0.50	0.67	0.046	< 1.0	< 0.10	< 0.10	< 0.50
Murrayville #1 well	11/18/2020																										
Murrayville #1 well	12/02/2020		1.96				< 0.010	< 0.050	< 0.050	< 0.050	12,900	13,500	< 0.010	< 0.010		13.7	65.4	60.6	< 0.50	< 0.50	< 0.50	0.57	0.039				< 0.50
Murrayville #2 well	03/11/2020																										
Murrayville #2 well	06/17/2020																										
Murrayville #2 well	09/03/2020	< 0.10	1.76	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	< 0.050	< 0.050	14,200	14,600	< 0.010	< 0.010	< 0.10	9.82	62.2	53.5	< 0.50	0.81	1.34	3.81	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50
Murrayville #2 well	11/18/2020																										
Murrayville #2 well	12/02/2020		1.67				< 0.010	< 0.050	< 0.050	< 0.050	13,100	14,700	< 0.010	< 0.010		7.46	54.5	51.0	< 0.50	1.22	0.88	3.44	< 0.018				< 0.50
Tall Timber #1 well	03/11/2020																										
Tall Timber #1 well	06/17/2020																										
Tall Timber #1 well	09/03/2020	< 0.10	3.83	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	< 0.050	< 0.050	12,400	12,700	< 0.010	< 0.010	< 0.10	39.7	74.8	68.1	< 0.50	0.55	1.18	3.01	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50
Tall Timber #2 well	03/11/2020																										
Tall Timber #2 well	06/17/2020																										
Tall Timber #2 well	09/09/2020	< 0.10	3.41	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	< 0.050	< 0.050	12,700	13,000	< 0.010	< 0.010	< 0.10	31.5	53.4	57.0	< 0.50	0.63	0.90	2.76	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50
Tall Timber #3 well	03/11/2020																										
Tall Timber #3 well	06/17/2020																										
Tall Timber #3 well	09/03/2020	< 0.10	3.77	< 0.10	< 0.10	< 0.10	< 0.010	< 0.050	< 0.050	< 0.050	12,400	13,100	< 0.010	< 0.010	< 0.10	35.7	77.4	68.3	< 0.50	0.56	1.12	2.98	< 0.018	< 1.0	< 0.10	< 0.10	< 0.50

Sampling Point	Collection Date	Thallium (dissolved)	Thallium (total)	Tin (dissolved)	Tin (total)	Titanium (dissolved)	Titanium (total)	Toluene	Total Dissolved Solids / TDS	Xylenes (total)	trans-1,2-Dichloroethylene	trans-1,3-Dichloropropene	Triallate	Trichloroethylene / TCE	Trichlorofluoromethane	Trifluralin	Uranium (dissolved)	Uranium (total)	Vanadium (dissolved)	Vanadium (total)	Zinc (dissolved)	Zinc (total)	Zirconium (dissolved)	Zirconium (total)
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Acadia #1 well	03/11/2020																							
Acadia #1 well	06/17/2020																							
Acadia #1 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	128	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	0.021	0.023	< 0.50	< 0.50	1.4	< 3.0	< 0.20	< 0.20
Acadia #1 well	11/18/2020																							
Acadia #1 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	130	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		0.023	0.022	< 0.50	< 0.50	1.7	13.8	< 0.20	< 0.20
Acadia #2 well	03/11/2020																							
Acadia #2 well	06/17/2020																							
Acadia #2 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	130	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	0.018	0.018	< 0.50	< 0.50	< 1.0	< 3.0	< 0.20	< 0.20
Acadia #2 well	11/18/2020																							
Acadia #2 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	120	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		0.017	0.018	< 0.50	< 0.50	< 1.0	< 3.0	< 0.20	< 0.20
Aldergrove #10 well	03/11/2020																							
Aldergrove #10 well	06/17/2020																							
Aldergrove #10 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	259	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	0.116	0.129	1.30	1.40	2.8	3.5	< 0.20	< 0.20
Aldergrove #10 well	11/18/2020																							
Aldergrove #10 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	230	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		0.133	0.128	1.23	1.38	3.7	6.5	< 0.20	< 0.20
Aldergrove #4 well	06/17/2020																							
Aldergrove #4 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	235	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	0.196	0.210	< 0.50	0.65	2.0	< 3.0	< 0.20	< 0.20
Aldergrove #4 well	11/18/2020																							
Aldergrove #4 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	248	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		0.186	0.195	< 0.50	0.64	6.3	6.5	< 0.20	< 0.20
Aldergrove #6 well	03/11/2020																							
Aldergrove #6 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	252	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	0.588	0.634	< 0.50	0.67	< 1.0	< 3.0	< 0.20	< 0.20
Aldergrove #6 well	11/18/2020																							
Aldergrove #6 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	260	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		0.653	0.673	< 0.50	0.60	< 1.0	< 3.0	< 0.20	< 0.20
Aldergrove #7 well	03/11/2020																							
Aldergrove #7 well	06/17/2020																							
Aldergrove #7 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	281	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	1.00	1.10	0.86	1.02	1.8	< 3.0	< 0.20	< 0.20
Aldergrove #7 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	273	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		1.05	1.02	0.83	0.98	2.0	< 3.0	< 0.20	< 0.20
Aldergrove #8 well	03/11/2020																							
Aldergrove #8 well	06/17/2020																							
Aldergrove #8 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	211	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	0.356	0.381	< 0.50	< 0.50	< 1.0	< 3.0	< 0.20	< 0.20
Aldergrove #8 well	11/18/2020																							
Aldergrove #8 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	216	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		0.435	0.466	< 0.50	< 0.50	< 1.0	< 3.0	< 0.20	0.26
Aldergrove #9 well	03/11/2020																							
Aldergrove #9 well	06/17/2020																							
Aldergrove #9 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	240	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	0.018	0.020	0.61	0.77	2.1	3.0	< 0.20	< 0.20
Aldergrove #9 well	11/18/2020																							
Aldergrove #9 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	214	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		0.017	0.019	0.59	0.72	2.7	< 3.0	< 0.20	< 0.20
Ft. Langley #2 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	219	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	0.013	0.016	< 0.50	< 0.50	10.9	14.2	< 0.20	< 0.20
Ft. Langley #2 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	218	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		0.014	0.014	< 0.50	< 0.50	14.2	11.6	< 0.20	< 0.20
Brookswood #10 well	06/17/2020																							

Sampling Point	Collection Date	Thallium (dissolved)	Thallium (total)	Tin (dissolved)	Tin (total)	Titanium (dissolved)	Titanium (total)	Toluene	Total Dissolved Solids / TDS	Xylenes (total)	trans-1,2-Dichloroethylene	trans-1,3-Dichloropropene	Triallate	Trichloroethylene / TCE	Trichlorofluoromethane	Trifluralin	Uranium (dissolved)	Uranium (total)	Vanadium (dissolved)	Vanadium (total)	Zinc (dissolved)	Zinc (total)	Zirconium (dissolved)	Zirconium (total)
Brookwood #10 well	06/19/2020																							
Brookwood #10 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	167	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	0.196	0.220	0.66	0.79	1.0	< 3.0	< 0.20	< 0.20
Brookwood #10 well	11/18/2020																							
Brookwood #10 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	178	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		0.238	0.229	0.65	0.86	1.2	< 3.0	< 0.20	< 0.20
Brookwood #7 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	151	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	< 0.010	0.011	< 0.50	0.61	4.8	4.0	< 0.20	< 0.20
Brookwood #7 well	11/18/2020																							
Brookwood #7 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	162	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		0.010	0.010	< 0.50	0.59	3.2	3.2	< 0.20	< 0.20
Brookwood #9 well	03/11/2020																							
Brookwood #9 well	06/17/2020																							
Brookwood #9 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	158	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	0.038	0.044	0.67	0.87	24.7	21.6	< 0.20	< 0.20
Brookwood #9 well	11/18/2020																							
Brookwood #9 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	160	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		0.043	0.052	0.59	1.16	20.0	15.5	< 0.20	< 0.20
Murrayville #1 well	03/11/2020																							
Murrayville #1 well	06/17/2020																							
Murrayville #1 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	1.03	4.18	< 0.40	120	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	< 0.010	< 0.010	< 0.50	0.57	< 1.0	< 3.0	< 0.20	< 0.20
Murrayville #1 well	11/18/2020																							
Murrayville #1 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	0.43	0.90	< 0.40	116	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		< 0.010	< 0.010	< 0.50	< 0.50	2.0	< 3.0	< 0.20	< 0.20
Murrayville #2 well	03/11/2020																							
Murrayville #2 well	06/17/2020																							
Murrayville #2 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	105	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	< 0.010	< 0.010	< 0.50	< 0.50	1.6	< 3.0	< 0.20	< 0.20
Murrayville #2 well	11/18/2020																							
Murrayville #2 well	12/02/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	100	< 0.75	< 0.50	< 0.50		< 0.50	< 0.50		< 0.010	< 0.010	< 0.50	< 0.50	6.2	< 3.0	< 0.20	< 0.20
Tall Timber #1 well	03/11/2020																							
Tall Timber #1 well	06/17/2020																							
Tall Timber #1 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	0.33	0.36	< 0.40	150	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	< 0.010	< 0.010	< 0.50	0.51	< 1.0	< 3.0	< 0.20	< 0.20
Tall Timber #2 well	03/11/2020																							
Tall Timber #2 well	06/17/2020																							
Tall Timber #2 well	09/09/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	142	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	< 0.010	< 0.010	< 0.50	< 0.50	< 1.0	< 3.0	< 0.20	< 0.20
Tall Timber #3 well	03/11/2020																							
Tall Timber #3 well	06/17/2020																							
Tall Timber #3 well	09/03/2020	< 0.010	< 0.010	< 0.10	< 0.10	< 0.30	< 0.30	< 0.40	140	< 0.75	< 0.50	< 0.50	< 0.10	< 0.50	< 0.50	< 0.10	< 0.010	< 0.010	< 0.50	< 0.50	1.8	< 3.0	< 0.20	< 0.20

**Table B.3 Quarterly Water Distribution Metal Samples by GVWD Results**

Analysis	Units	Canadian Guideline Limit	TOL-463	TOL-467	TOL-469	TOL-691	TOL-694	TOL-463	TOL-467	TOL-469	TOL-691	TOL-694
			19951 - 99A Ave.	7025 - 208 Street	5679 - 211 Street	26829 - 60 Avenue	23752 - 52 Avenue	19951 - 99A Ave.	7025 - 208 Street	5679 - 211 Street	26829 - 60 Avenue	23752 - 52 Avenue
			23/03/2020 8:40	23/03/2020 9:20	23/03/2020 9:45	23/03/2020 10:50	23/03/2020 10:10	27/10/2020 12:45	27/10/2020 12:05	27/10/2020 8:40	27/10/2020 11:20	27/10/2020 10:30
			GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Aluminum Total	µg/L	200	189	83	71	86	86	84	85	82	85	95
Antimony Total	µg/L	6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arsenic Total	µg/L	10 (ALARA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium Total	µg/L	1000	8.4	2.1	1.3	1.9	2.1	2.5	2.3	1.7	2.1	2.5
Boron Total	µg/L	5000	29	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium Total	µg/L	5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Calcium Total	µg/L	none	14800	840	970	1130	1020	1610	891	1170	1260	1320
Chromium Total	µg/L	50	0.17	<0.05	0.06	<0.05	<0.05	0.06	0.05	0.06	0.06	0.11
Cobalt Total	µg/L	none	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper Total	µg/L	≤2000	23.4	10	2.9	2.6	8.2	22.3	11.3	15.8	2.8	9.8
Iron Total	µg/L	≤ 300	165	58	57	57	55	61	69	57	62	64
Lead Total	µg/L	5 (ALARA)	4	<0.5	<0.5	<0.5	<0.5	1.1	0.5	2.6	<0.5	<0.5
Magnesium Total	µg/L	none	5830	101	98	93	98	406	101	87	102	116
Manganese Total	µg/L	120	56.6	1.7	1.8	1.5	1.9	2.2	3.8	1.3	1.8	2.3
Mercury Total	µg/L	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Molybdenum Total	µg/L	none	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel Total	µg/L	none	23.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Potassium Total	µg/L	none	1590	111	118	116	119	200	122	121	132	133
Selenium Total	µg/L	50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver Total	µg/L	none	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium Total	µg/L	≤ 200,000	25900	5390	5460	5580	5380	6420	5520	5770	5710	5740
Zinc Total	µg/L	≤ 5000	14.5	10.7	4.3	3.6	<3.0	7.8	9.8	8.7	<3.0	33.1

**Table B.4.1 Distribution System Quarterly Results by GVWD**  
Township of Langley Water Distribution System Disinfectant By-products

Sample	Date Sampled	THM (ppb)						HAA (ppb)						
		Bromodichloromethane	Bromoform	Chlorodibromomethane	Chloroform	Total Trihalomethanes	Total THM Quarterly Average (Guideline Limit 100 ppb)	Dibromoacetic Acid	Dichloroacetic Acid	Monobromoacetic Acid	Monochloroacetic Acid	Trichloroacetic Acid	Total Haloacetic Acid	Total HAA Quarterly Average (Guideline Limit 80 ppb)
TOL-463	25-Feb-20	<1	<1	<1	23	25	21	<0.5	10	<1	<2	11.2	22.3	23
TOL-463	26-May-20	1	2	1	16	20	19	0.6	9	<1	<2	12.1	21.4	22
TOL-463	11-Aug-20	1	<1	<1	39	41	29	<0.5	16	<1	<2	22.6	39.1	22
TOL-463	2-Dec-20	<1	<1	<1	21	22	27	<0.5	16	<1	3	18.6	37.3	30
TOL-465	25-Feb-20	<1	<1	<1	28	30		<0.5	9	<1	<2	21.6	31.2	
TOL-465	26-May-20	<1	<1	<1	34	35		<0.5	7	<1	<2	25.8	34.2	
TOL-465	11-Aug-20	2	<1	<1	31	33		<0.5	13	<1	<2	45.8	59.1	
TOL-465	2-Dec-20	<1	<1	<1	32	33	33	<0.5	9	<1	<2	23.6	35.3	40
TOL-469	25-Feb-20	1	<1	<1	36	37		<0.5	3	<1	<2	24.1	27.2	
TOL-469	26-May-20	<1	<1	<1	36	38		<0.5	1	<1	<2	29.2	30.6	
TOL-469	11-Aug-20	1	<1	<1	29	31		<0.5	13	<1	<2	37	50.9	
TOL-469	2-Dec-20	<1	<1	<1	42	43	37	<0.5	11	<1	<2	27.4	40.8	37
TOL-691	25-Feb-20	1	<1	<1	35	37		<0.5	5	<1	<2	29	34.5	
TOL-691	26-May-20	<1	<1	<1	36	37		<0.5	5	<1	<2	37	42.5	
TOL-691	11-Aug-20	<1	<1	<1	26	28		<0.5	9	<1	<2	59.8	69.1	
TOL-691	2-Dec-20	<1	<1	<1	45	46	37	<0.5	6	<1	<2	49.5	57.2	51
TOL 694	25-Feb-20	<1	<1	<1	28	29		<0.5	8	<1	<2	15	23.5	
TOL 694	26-May-20	<1	<1	<1	37	38		<0.5	16	<1	<2	36	52.7	
TOL 694	11-Aug-20	<1	<1	<1	46	48		<0.5	22	<1	3	55	80.5	
TOL 694	2-Dec-20	<1	<1	<1	42	43	40	<0.5	16	<1	3	46.6	66.7	56

**Township of Langley Water Distribution System Disinfectant By-products – Vinyl Chloride**

Sample Name	Sample Description	Sample Date	Sample Type	Vinyl Chloride (µg/L)
TOL-463	19951 - 99A Ave.	16/06/2020 10:30	GRAB	<1
TOL-463	19951 - 99A Ave.	26/11/2020 10:00	GRAB	<1
TOL-465	6350 - 197 Street	16/06/2020 10:05	GRAB	<1
TOL-465	6350 - 197 Street	26/11/2020 10:00	GRAB	<1
TOL-468	21584 - 78 Avenue	16/06/2020 9:25	GRAB	<1
TOL-468	21584 - 78 Avenue	26/11/2020 10:00	GRAB	<1
TOL-691	26829 - 60 Avenue	16/06/2020 8:40	GRAB	<1
TOL-691	26829 - 60 Avenue	26/11/2020 10:00	GRAB	<1
TOL-694	23752 - 52 Avenue	16/06/2020 7:50	GRAB	<1
TOL-694	23752 - 52 Avenue	26/11/2020 10:00	GRAB	<1

**Table B.4.2 Distribution System Quarterly Results by TOL**

Sampling Point	Collection Date	HAA (mg/L)	TOC (mg/L)	THM (mg/L)	Conductivity (us/cm)	VOC (mg/L)
G	3/20/2019	0.0077	0.66	0.021	335	< 0.00040
L	3/20/2019	0.0339	1.39	0.0406	52.2	< 0.00040
T	3/20/2019	0.0181	0.74	0.0235	202	< 0.00040
J (460)	3/20/2019	0.0285	0.97	0.0265	108	< 0.00040
V	3/20/2019	< 0.0054	0.64	0.0104	178	< 0.00040