

# DRINKING WATER SAFETY

in Newfoundland and Labrador

2020 Annual Report







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# EXECUTIVE SUMMARY

During the 2019-20 reporting year, the Department of Municipal Affairs and Environment was responsible for municipal infrastructure. On September 10, 2020 departmental restructuring was announced which reassigned responsibility for municipal infrastructure from the renamed Department of Environment, Climate Change and Municipalities to the Department of Transportation and Infrastructure. The Department of Environment, Climate Change and Municipalities was subsequently further restructured into the Department of Environment and Climate Change and the Department of Municipal and Provincial Affairs on April 8, 2021. For clarity, the current names of departments at the time of writing are used throughout this report.

The Multi-Barrier Strategic Action Plan (MBSAP) has three levels with various components in each level enhancing the safety of public drinking water systems in Newfoundland and Labrador as highlighted below. This report describes the initiatives, activities and accomplishments pertaining to the MBSAP for drinking water safety of public drinking water systems for the 2019–20 fiscal year. This is the 19th annual report prepared by the Department of Environment and Climate Change, Government of Newfoundland and Labrador.

## Highlights of MBSAP component indicators for the 2019–20 fiscal year include:

### Level I Source Protection and Distribution

- 322 protected public water supply areas in the province
- 80 land use referrals reviewed for proposed activities concerning protected public water supply areas
- 70 permits issued for development activity in a protected public water supply area
- Five watershed management committees
- 498 disinfection systems, 135 drinking water treatment systems, 21 water treatment plants (WTPs), and 32 potable water dispensing units (PWDUs)
- 121 permits issued to construct water and sewer infrastructure
- \$82,032,859 approved for water infrastructure projects

### Level II Monitoring and Enforcement

- 18,697 bacteriological samples and 3,526 chemical and physical water quality samples were collected
- 189 active boil water advisories (BWAs) as of March 31, 2020
- Bacteriological and chemical drinking water quality exceedances recorded (Table 11)
- 1,112 seasonal community updates were available through the water resources portal
- 115 regulatory inspections/investigations performed
- 22 drinking water related classroom seminars and 113 on-site training seminars conducted
- 562 certified water or wastewater system operators
- Corrective measures undertaken (Table 16)

### Level III Public Policy

- Boil Water Advisory (BWA) Reduction Initiative Study – Delivery of Mentoring Program for the Reduction of BWAs in Newfoundland and Labrador
- Evaluation of Point of Use/Point of Entry Water Treatment Systems in Newfoundland and Labrador
- Evaluation of New Drinking Water Filtration Systems in Newfoundland and Labrador
- Revised drinking water guideline for copper, manganese, and strontium adopted



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## MESSAGE FROM THE MINISTER



As the Minister of Environment and Climate Change, I am pleased to present the 2020 Annual Report on Drinking Water Safety in Newfoundland and Labrador.

We are making significant progress in addressing water quality issues in our province, and we have reached some very encouraging milestones. The number of long-term Boil Water Advisories that have been in place for more than five years and the number of pH exceedances have both reached an all-time low. The department is also pleased to report that the number of communities with a certified operator, the number of certified operators, and number of certificates awarded to water system operators in a given year reached an all-time high.

We continue to work with regional service boards, municipalities and local service districts, Inuit Community Governments, and Municipalities NL to resolve advisories through maintenance, training, and investments in infrastructure.

Newfoundland and Labrador's Drinking Water Program is guided by the framework under the Multi-Barrier Strategic Action Plan, and it provides a comprehensive and adaptive outline for managing and ensuring the safety of public drinking water systems. This plan is a joint effort between the departments of Environment and Climate Change, Health and Community Services, Digital Government and Service NL, Regional Health Authorities, and the owners and operators of public water supply systems.

I would like to acknowledge the staff of the department for their tireless commitment and dedication to help ensure clean, safe, and reliable drinking water in Newfoundland and Labrador.

Some of the highlights of progress made on drinking water safety in 2019-20 include:

- The number of long-term Boil Water Advisories (BWA) that have been in place for more than five years reached an all-time low
- The number of pH exceedances reached an all-time low
- The number of positive Total Coliform tests reached an all-time low
- The number of communities with a certified operator, the number of certified operators, and number of certificates awarded to water system operators in a given year reached an all-time high
- The percentage of drinking water systems with chlorination reached an all-time high
- The number of water treatment plants and PWDUs in the province reached an all-time high

Sincerely,

A handwritten signature in black ink, appearing to be 'Bernard Davis', written over a white background.

Hon. Bernard Davis  
Minister of Environment and Climate Change

Drinking  
Water Safety in  
Newfoundland  
and Labrador

2020  
Annual Report

# INTRODUCTION

This report highlights the initiatives, activities and accomplishments of the departments that implemented the Multi-Barrier Strategic Action Plan (MBSAP) in the 2019–20 fiscal year (April 1, 2019, to March 31, 2020). The report describes the three levels of the MBSAP and their various components (Figure 1). It illustrates how government is implementing the MBSAP.

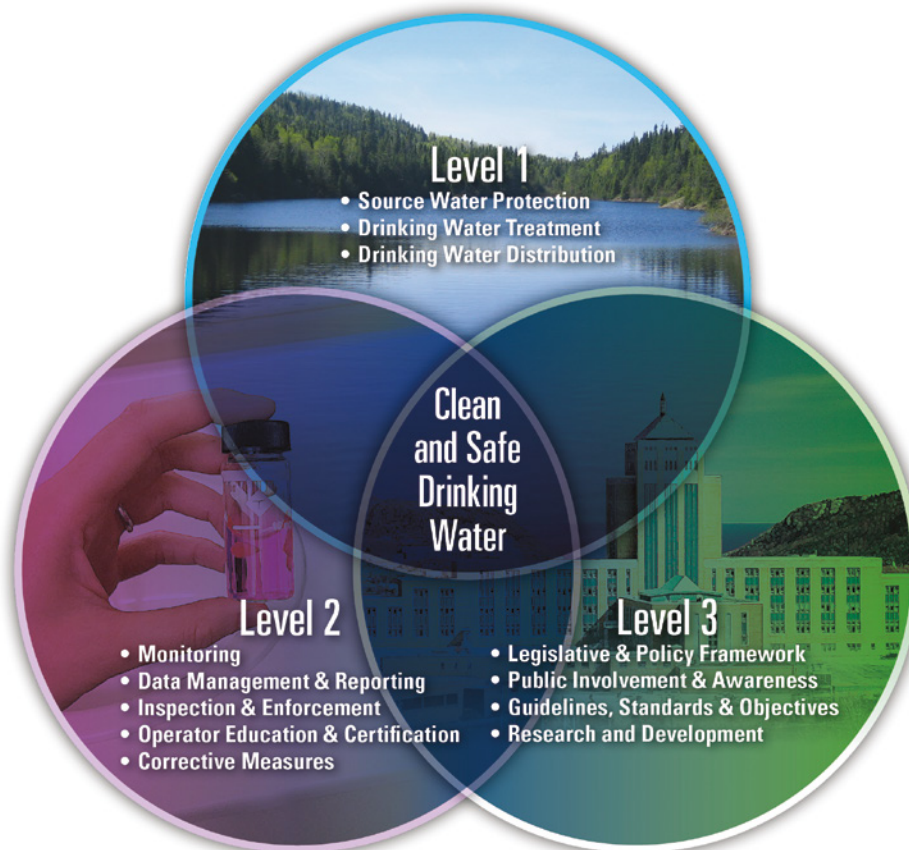
The MBSAP is considered to be the most effective method of managing drinking water systems and has been implemented by other jurisdictions throughout Canada.

The implementation of the MBSAP involves the collaborative efforts of four provincial government departments:

1. Environment and Climate Change (lead department)
2. Health and Community Services
3. Digital Government and Service NL
4. Transportation and Infrastructure

In this report, indicators are reported for various components of the MBSAP. Information is reported for the current fiscal year alongside of previous fiscal years in order to evaluate performance of the existing drinking water framework. In addition, illustrations of technical work related to drinking water in this province are highlighted.

**Figure 1: The Multi-Barrier Strategic Action Plan**



# LEVEL I

The components of the first level of the MBSAP protect drinking water from the source to the tap.

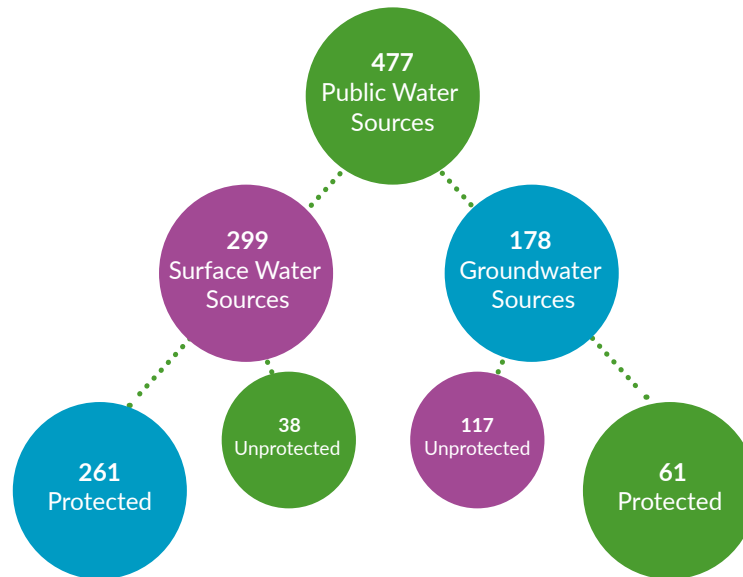
The three components of Level I of the MBSAP are:

1. Source water protection
2. Drinking water treatment
3. Drinking water distribution

## Source Water Protection

Protected public water supply areas (PPWSAs) are protected under Section 39 of the Water Resources Act. These PPWSAs service a population of 414,666, representing ninety-four percent of the population serviced by public drinking water systems. Figure 2 shows the status of public water sources for fiscal year 2019–20.

Figure 2: Status of Public Water Sources



The Department of Environment and Climate Change encourages all communities to begin the protection process for new or existing drinking water sources if they have not already done so.

## Watershed Management

The Water Resources Management Division (WRMD) regulates development activities within protected public water supply areas. WRMD uses a number of tools to monitor such activities, including:

- Referrals from the Interdepartmental Land Use Committee (ILUC), Fisheries, Forestry and Agriculture (Crown Lands Branch); Industry, Energy and Technology (Mining and Mineral Development Branch) and other divisions within ECC (Environmental Assessment Division (EA), Local Governance and Land Use Planning Division)
- Permits for development activity
- Watershed management plans
- Watershed management committees
- Community monitoring and inspections
- Regulatory inspections



## HIGHLIGHT

### Beavers in Watersheds

There are two main concerns with the presence of beavers inside Protected Public Water Supply Areas:

- Potential source of parasites (e.g. *Giardia lamblia* and *Cryptosporidium*) and
- Beaver dams altering the quality and quantity of drinking water.

Beavers may carry the microscopic parasites *Giardia lamblia* and *Cryptosporidium* and may contaminate raw water sources. Drinking water with *Giardia lamblia* can lead to giardiasis (“beaver fever”), an illness that causes severe diarrhea in humans. Drinking water with *Cryptosporidium* can lead to cryptosporidiosis (“crypto”), an illness that can cause severe bloody diarrhea and blood infections. The province has seen eight confirmed outbreaks of giardiasis in public water supplies, the majority of which were linked to the presence of beavers in the water supply, with the last confirmed outbreak occurring in 2002.

When beavers build dams to stop the flow of water, the quantity of water in a watershed can significantly increase or decrease depending on the location of the dam. The chemical and physical composition of the water can also be negatively impacted when water that would not normally enter the intake area is introduced from flooding caused by dams.

If a Municipality or Local Service District determines beavers are becoming a nuisance within their watershed and pose a threat to public health, they should first contact their nearest Forest Management District office to determine the best course of action. Options may include: i) trapping and relocation of the beaver (and family) in conjunction with trapline licence holders, ii) removal of the dam or, iii) the use of beaver bafflers that allow a certain amount of water to pass through, without the beaver being able to dam it.

National best practices for the removal of beaver dams are contained in the Fisheries and Oceans Canada code of practice document “Beaver Dam Removal” accessed via: [dfo-mpo.gc.ca/pnw-ppe/codes/beaver-dam-barrage-castor-eng.html](https://dfo-mpo.gc.ca/pnw-ppe/codes/beaver-dam-barrage-castor-eng.html)



Beaver Dam in St. Mary's River PPWSA – Mary's Harbour

## Referrals

In the 2019–20 fiscal year, WRMD processed 80 referrals from various departments for proposed activities concerning PPWSAs as outlined in Table 1.

**Table 1: Number of Referrals Processed**

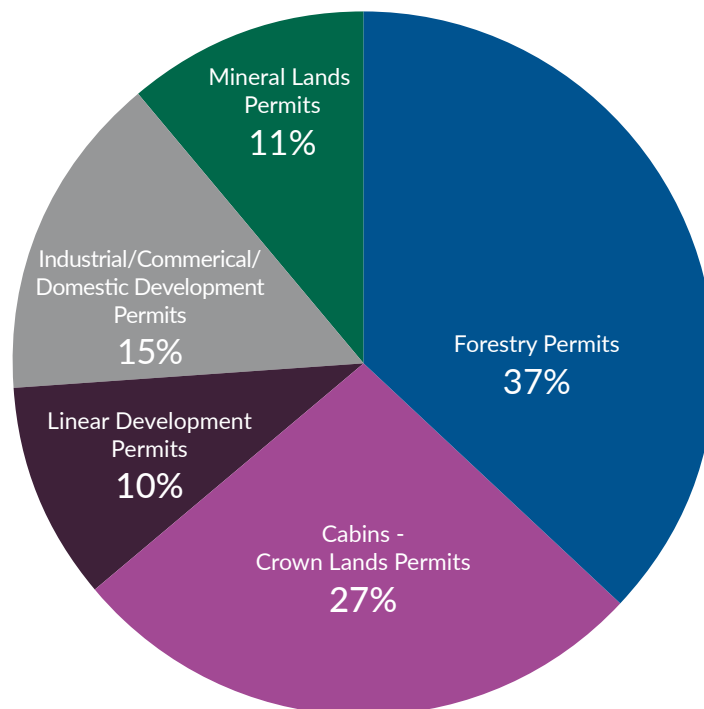
Type of Referral					Total
Lands Branch	Mines Branch	ILUC	Environmental Assessment	Other	
62	10	4	3	1	80

WRMD has continuously worked to promote awareness of PPWSAs to the public, industry, communities and government departments and agencies. As proponents become increasingly aware of the stringent regulations for activities within PPWSAs, and of the PPWSA boundaries themselves, they may look for alternate development locations outside of PPWSAs. As a result, a decline in the number of referrals that WRMD has to review concerning PPWSAs can be expected.

## Activity Permits

All activities in a PPWSA (either a protected public water supply area, or a wellhead protected water supply area) require a permit under the Water Resources Act. During the 2019–20 fiscal year, 70 development activity permits were issued. Figure 3 illustrates the distribution of development permits by type. Figure 4 shows the total number of permits issued for development activities within a PPWSA for each fiscal year since 2015-16.

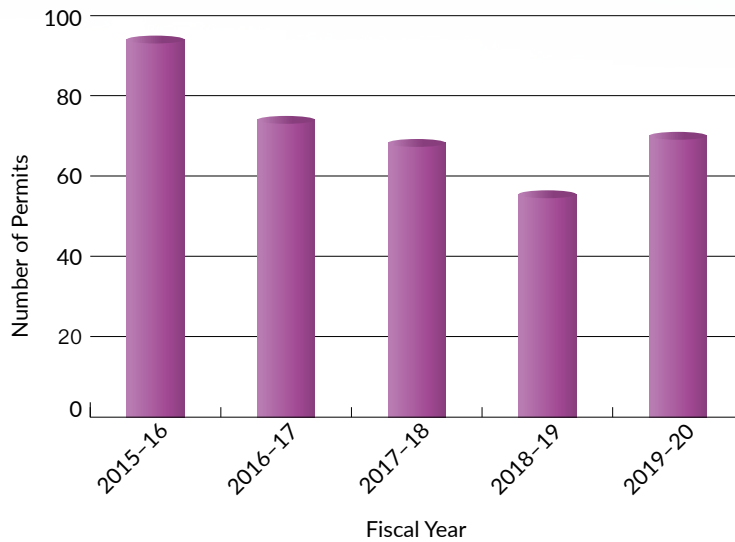
**Figure 3: Type of Development Permits**



The top developmental activities for which permits were issued include:

1. Forestry activities
2. Cabins – Crown Lands Permits

**Figure 4: Permits Issued per Fiscal Year**



### Watershed Management Committees

Watershed management committees are formed to oversee land use management, potential development, and resource use conflict inside a PPWSA. Some committees develop watershed management plans (WMP) to help manage the watershed. The active watershed management committees in the province during 2019-20 were located in:

- Clarenville
- Corner Brook (WMP)
- Gander (WMP)
- Grand Falls-Windsor
- Steady Brook (WMP)

### Drinking Water Treatment

Water treatment strategies are used to address different water quality issues and to treat the water before it is consumed.

#### Disinfection

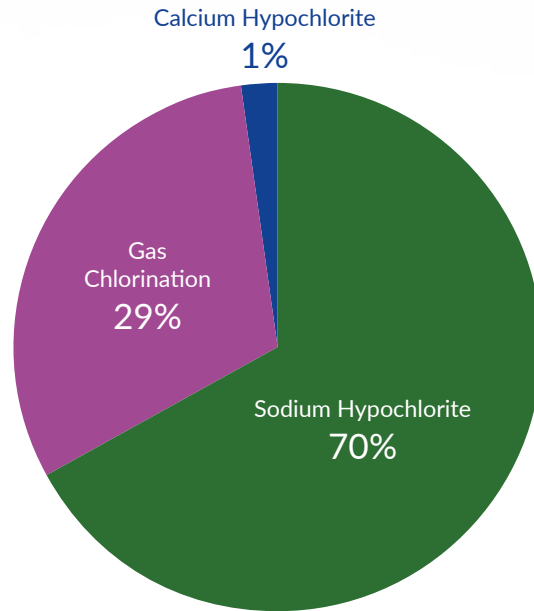
The most critical aspect of water treatment is disinfection as it ensures the pathogenic safety of drinking water. While there are several forms of disinfection used in the treatment of drinking water, chlorination is the most commonly used disinfection method in the province. The different disinfection methods in operation within the province are listed in Table 2.

**Table 2: Number of Disinfection Systems in Newfoundland and Labrador**

Type of Disinfection System				
Chlorination	Ultraviolet Light	Ozone	Chloramines	On-Site Generation
451	34	3	2	8

There are a number of different chlorination system types in the province. Figure 5 illustrates the distribution of these systems in 2019-20.

**Figure 5: Chlorination Systems Used in Newfoundland and Labrador**



### Parameter Specific Drinking Water Treatment

Mitigation measures have been implemented in numerous drinking water systems to alleviate water quality challenges related to various local parameters (e.g., pH). Table 3 shows the number and type of drinking water treatment systems operational in the province as of the 2019-20 fiscal year.

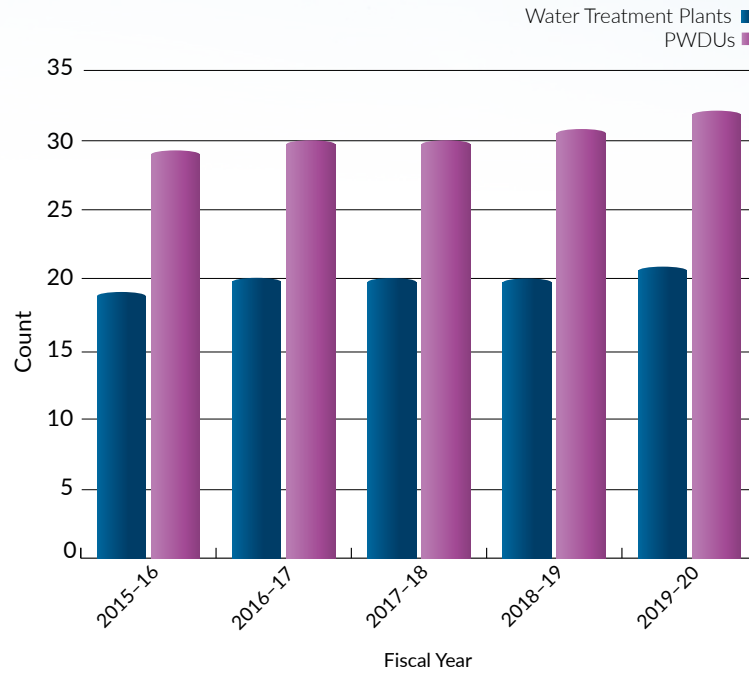
**Table 3: Number of Water Treatment Systems in Newfoundland and Labrador**

Type of Drinking Water Treatment System						
pH adjustment	Micron/pressure filters	Infiltration galleries	Arsenic removal	Iron/Manganese removal	Lead removal	Strontium removal
55	38	25	11	4	1	1

### Water Treatment Plants

As of March 31, 2020, 53 water treatment plants are in place in Newfoundland and Labrador (this number includes 32 potable water dispensing units). Figure 6 illustrates the total number of water treatment plants in Newfoundland and Labrador for each fiscal year since 2015-16.

**Figure 6: Water Treatment Plants per Fiscal Year**



## Drinking Water Distribution

The drinking water distribution system is the largest component of physical infrastructure that ensures drinking water safety. It includes all the pipes, valves, service lines, pumping stations, fire hydrants, and storage facilities required to deliver clean and safe drinking water.

In fiscal year 2019–20, there were 509 public water distribution systems in the province. Table 4 shows the breakdown of the number of water distribution systems for 2019–20. Sixty-five percent of public water distribution systems fall into the “less than 500” classification.

**Table 4: Public Water Distribution System Classes for 2019-20**

Size (population serviced)	> 50,000	15,001 - 50,000	1,501 - 15,000	501 - 1,500	≤ 500	Unknown	Total
Count	1	5	37	81	333	52	509

During the 2019-20 fiscal year, the Government of Newfoundland and Labrador approved \$82,032,859 for water related projects. Table 5 provides a breakdown of initiatives from April 1, 2019 to March 31, 2020.

In 2019–20, the department issued five permits to operate for drinking water systems and 121 permits to construct under Sections 36, 37, 39 and 48 of the Water Resources Act. The total number of active permits to operate for drinking water systems at the end of the 2019–20 fiscal year was 324. Figure 7 shows the number of permits to construct issued for each fiscal year since 2015–16.

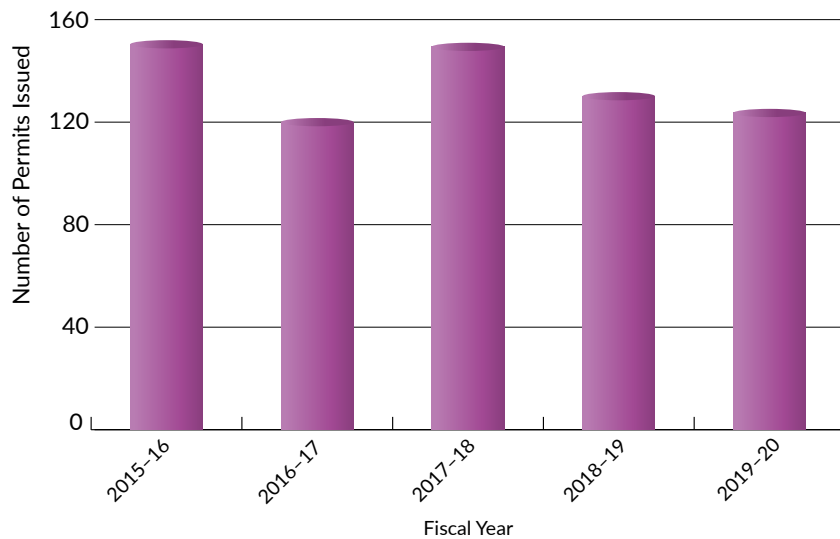
**Table 5: Funding Approved for 2019-20**

Category	Funding (\$)*
New Water Distribution	\$14,140,906
Upgrades to Water Distribution	\$58,059,302
New Drinking Water Treatment	\$5,470,405
Upgrades to Drinking Water Treatment	\$3,545,363
DWSI/PWDU**	\$499,286
Studies	\$317,597
<b>Total</b>	<b>\$82,032,859</b>

\*Provincial share less GST amounts show.

\*\*Drinking Water Safety Initiative/Potable Water Dispensing Units

**Figure 7: Number of Permits to Construct per Fiscal Year**



## LEVEL II

The standard of performance achieved in Level I of the MBSAP is verified through the components of Level II. The five components in Level II of the MBSAP are:

1. Monitoring
2. Data management and reporting
3. Inspection and enforcement
4. Operator education, training, and certification
5. Corrective measures

### Monitoring

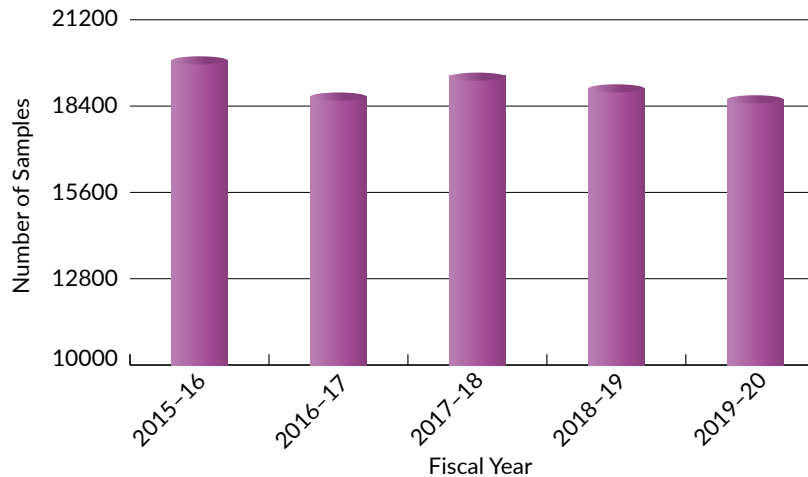
Drinking water quality monitoring consists of regular sampling and testing of drinking water from both the source and the tap. The extensive monitoring program for drinking water quality in the province is a joint responsibility shared by the Departments of Environment and Climate Change, Health and Community Services, and Digital Government and Service NL.

### Bacteriological and Chemical Water Quality

#### Bacteriological Water Quality

Environmental Health Officers and Environmental Technicians with the Department of Digital Government and Service NL collect tap water samples from public drinking water supplies for analysis of bacteriological parameters. The parameters monitored include total coliforms and *Escherichia coli* (*E. coli*). During 2019–20, 18,697 public water supply bacteriological samples were collected and tested. Figure 8 shows the total number of bacteriological samples that were collected and tested for each fiscal year since 2015–16.

**Figure 8:** Bacteriological Samples Tested per Fiscal Year



The number of bacteriological samples tested at each regional drinking water testing facility is shown in Table 6.

**Table 6: Number of Bacteriological Samples Tested in Each Region for 2019–20**

Region					Total
St. John's	Eastern	Central	Western	Northern	
7,853	1,133	4,002	3,315	2,394	18,697

### Bacteriological Parameters: Results

Based on the analysis of bacteriological parameters for public drinking water samples taken during the 2019–20 fiscal year, 579 public water supply samples tested were found to be unsatisfactory in terms of total coliforms. An unsatisfactory result indicates the presence of total coliforms and/or E. coli bacteria counts in the sample. Table 7 shows the percentage of samples found to be unsatisfactory for total coliforms at each regional drinking water testing facility for the fiscal year 2019–20.

**Table 7: Percentage of Unsatisfactory Samples by Region for Total Coliforms for 2019–20**

Sample Numbers by Region	Region				
	St. John's	Eastern	Central	Western	Northern
Unsatisfactory samples	153	38	129	153	106
Per cent of Exceedances by Region (%)	27	7	22	26	18
Per cent of Samples Collected with an Exceedance (%)	2	3	3	5	4

There were 137 bacteriological samples tested that were found to be unsatisfactory in terms of E. coli. Table 8 shows the percentage of samples found to be unsatisfactory for E. coli, at each regional drinking water testing facility, for the fiscal year 2019–20.

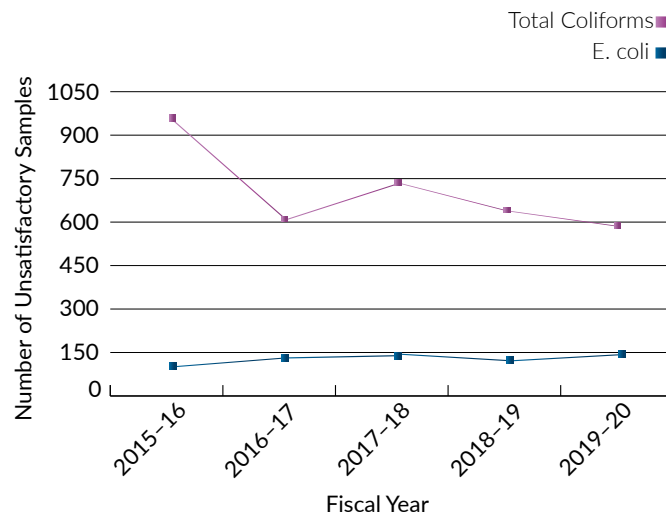


**Table 8:** Percentage of Unsatisfactory Samples by Region for E. coli for 2019–20

Sample Numbers by Region	Region				
	St. John's	Eastern	Central	Western	Northern
Unsatisfactory samples	17	10	19	44	47
Per cent of Exceedances by Region (%)	13	7	14	32	34
Per cent of Samples Collected with and Exceedance (%)	0.2	0.9	0.5	1.3	2.0

The number of unsatisfactory samples for total coliforms and E. coli for each fiscal year since 2015–16 is shown in Figure 9.

**Figure 9:** Unsatisfactory Bacteriological Samples per Fiscal Year

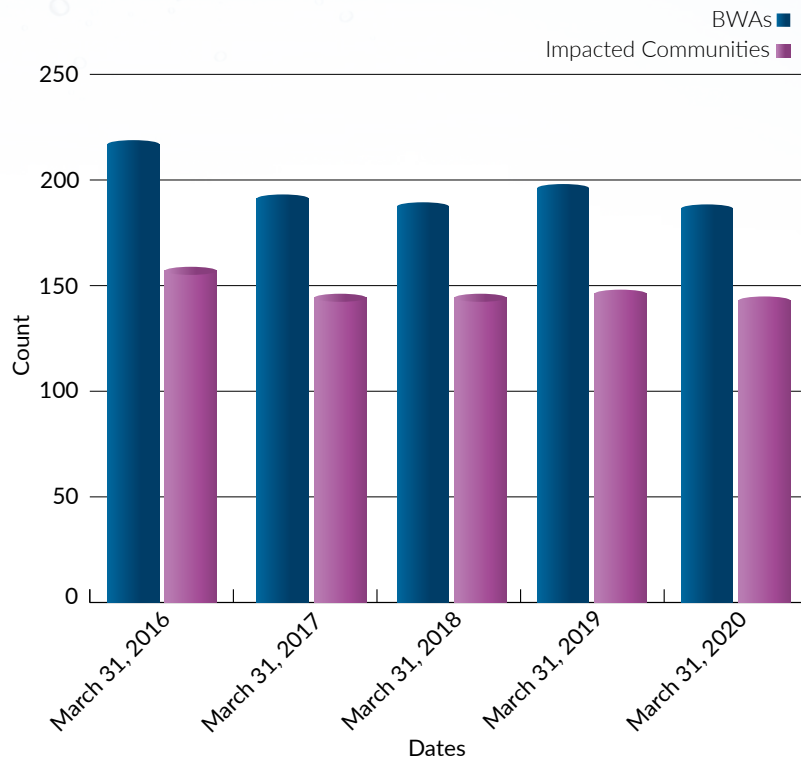


\*Escherichia coli (E. coli) is considered a good indicator of recent fecal contamination of drinking water and the possible presence of disease causing microorganisms.

### Boil Water Advisories

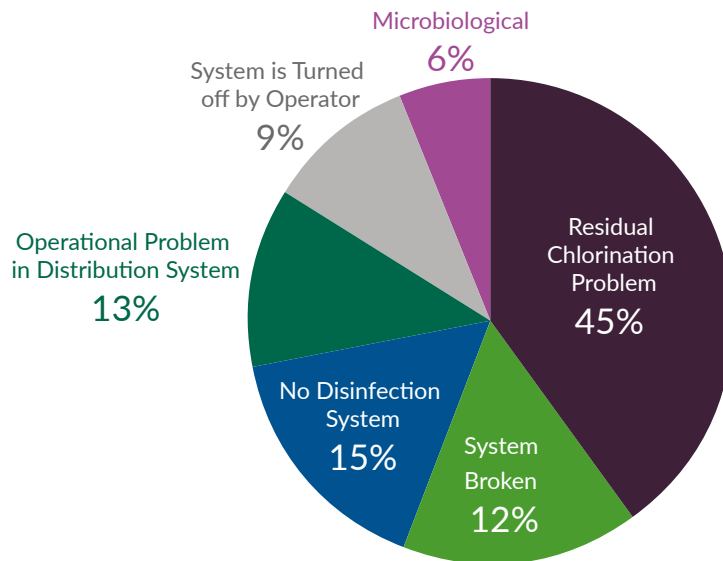
Boil water advisories are preventative measures for protecting public health from waterborne microbiological contamination that may, or are known to be, present in drinking water. A BWA is also issued when water quality is questionable due to operational deficiencies (such as inadequate chlorine residual), no disinfection system, or the water in a community's water system is contaminated with bacteriological indicators (such as total coliforms). Figure 10 shows a comparison of BWAs at the end of each fiscal year since March 31, 2016.

**Figure 10: Number of BWAs and Number of Communities Affected**



On March 31, 2020, 189 BWAs were in effect (this includes long-term BWAs), affecting 146 communities in the province, with an impacted population of 52,753 (12% of the total population serviced by public water supplies). Figure 11 illustrates the distribution of existing BWAs by reason used to issue the advisory for the 2019–20 fiscal year.

**Figure 11: Reasons for BWAs**



Long term BWAs are BWAs that have been in effect for a period of five years or greater at the end of the March 31, 2020. A total of 129 BWAs have been in effect for a period of five years or greater.

## HIGHLIGHT

### Students Learn About Their Community's Drinking Water Challenges through Science Competition

Each November, FIRST LEGO® League (FLL) Newfoundland and Labrador organizes a day competition in partnership with Skills Canada to help students learn about real-world scientific topics. Guided by adult coaches, teams of students research a real-world problem and are challenged to develop a solution. The competition all adds up to a lot of fun while students learn to solve a problem by applying science, technology, engineering, and math concepts plus a dose of imagination!

The 2019 Competition took place on November 23rd in St. John's and this year's theme was "City Shaper", where teams were instructed to choose an issue or problem to solve within their community. A group of students from Holy Mary Academy in Lawn, NL, chose to focus on their community's drinking water quality. The students researched and presented on boil water advisories (which, are an ongoing concern in many small communities), water treatment technologies (e.g., Mixed Oxidants and chlorination), potable water dispensing units, risks associated with coliforms, etc. Their solution involved installing multiple sets of water filters including crushed granite, porcelain sand, activated carbon and quartz sand filters. Together with their coaches, they scripted a theatrical presentation to illustrate the problem at hand and highlight their solution; they even got the town's Water Quality Operators in on the action, including them as characters in their presentation and writing their very own closing song!

As part of their research, the team visited the town's source of drinking water, Brazil Pond, and toured the town's current water treatment facility. An EHO with Digital Government and Service NL came in and taught the team about bacteriological testing of public drinking water. BIG congratulations to the H2-WHOA Mustang Megabots team for their 1st Place award!



**Grade 6-9 Students, Holy Name of Mary Academy in Lawn, NL**

**Back row: Maddie Brockerville, Kassie Clarke, McKayla Power, Logan Strang, Olivia Strang**

**Front row: Adam Strang, Lillian Flannigan, Brianna Pike, Amber Isaac's, Victoria Tarrant.**

## Chemical and Physical Water Quality

The number of chemical and physical water quality samples taken by region for 2019–20 are presented in Table 9. Analysis of chemical and physical parameters is performed by an accredited laboratory ensuring that the laboratory provides quality and competency in its sample analysis.

**Table 9:** Number of Samples Taken by the Department for 2019–20

Region	Source	Tap	THM	HAA	Total
Eastern	135	398	435	435	1,403
Western	33	301	354	354	1,042
Central	26	194	276	274	770
Labrador	22	68	104	105	299
Other (Special)	4	4	2	2	12
<b>Total</b>	<b>220</b>	<b>965</b>	<b>1,171</b>	<b>1,170</b>	<b>3,526</b>

In 2019–20, the department collected 3,526 samples. Table 10 shows the number of samples scheduled and the number actually taken for 2019–20.

**Table 10:** Number of Samples Scheduled and Collected by the Department for 2019–20

Type of Sample	Scheduled	Collected
Tap	992	965
Trihalomethanes	1,315	1,171
Haloacetic acids	1,315	1,170
Source	234	220
<b>Total</b>	<b>3,856</b>	<b>3,526</b>

Some samples were not collected for the following reasons:

- Town was not chlorinating at the time of sampling (THM and HAA samples)
- Water supply not operating at the time of sampling (tap, THM and HAA samples)
- No sample location available at the time of sampling (very small systems)
- Source inaccessible

Every year, the department schedules special parameter monitoring. In 2019–20, a special parameter monitoring program was continued for manganese speciation, hydrocarbons in the Humber Canal water supply used by the Towns of Deer Lake and Reidville, and for event based sampling of sources after high precipitation events.

## HIGHLIGHT

### Who is Testing My Water?

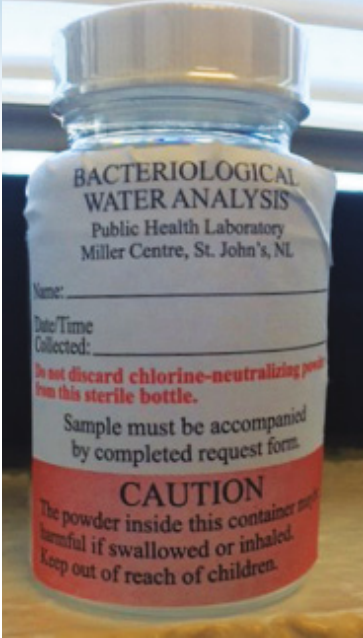
The Guidelines for Canadian Drinking Water Quality published by Health Canada, in collaboration with other provincial government departments, establish acceptable levels of parameters commonly found in tap water across Canada. These parameters can be classed as microbiological (Total Coliform and Eschericia Coli bacteria guidelines), chemical and physical parameters (contaminants and aesthetic guidelines), or radiological parameters (special sampling).

Communities with public water supplies in Newfoundland and Labrador can expect to see drinking water testing carried out in their community by representatives from two different Provincial Government departments throughout the year, namely:

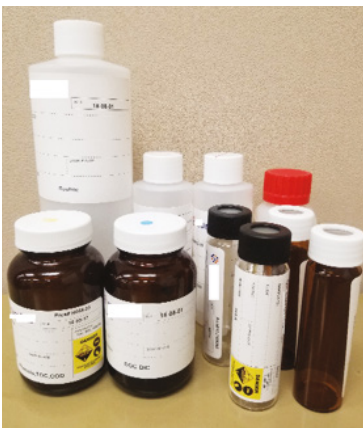
- Environmental Scientists and Engineers from the Water Resources Management Division (WRMD) of the Department of Environment and Climate Change
- Environmental Health Officers (EHOs) and Environmental Technicians from Digital Government and Service NL

Through the WRMD, Environmental Scientists and Engineers collect source and tap water samples for chemical, physical, and radiological parameters. Public water supplies are tested based on source water type (surface or groundwater), whether or not the community is chlorinating, and population. Communities with a population of 5,000 or greater will have tap water tested four times a year. Communities with a population of less than 5,000 will be tested a minimum of twice a year. If the community is chlorinating consistently, they will be tested four times a year for disinfection by-products (DBPs). A water sample taken by WRMD staff would generally consist of an inorganic kit (5 - 6 different size bottles in a plastic bag), DBP vials (two clear glass and two amber glass vials) and a chlorine testing kit. WRMD staff will sample one tap water location per public water supply and a source water sample, if scheduled for that year. The results of these samples are posted online quarterly and notification of their posting is sent to the community authority. WRMD staff operate out of four provincial office locations province wide within different regions. WRMD office locations and contact information can be found online at: [gov.nl.ca/ecc/department/contact/wrmd/](http://gov.nl.ca/ecc/department/contact/wrmd/)

Environmental Health Officers (EHO) and Environmental Technicians, with the Department of Digital Government and Service NL test drinking water for the presence of microbiological parameters and conduct chlorine residual testing monthly for public water supplies in the province. A water sample taken by an EHO would generally consist of one or two plastic bottles and a chlorine testing kit. An EHO will often sample multiple locations within a public water supply and sample results are forwarded to the community authority. EHOs operate out of thirteen Government Service Centre locations province wide. Government Service Centre locations and contact information can be found online via: [gov.nl.ca/dgsnl/department/contact/#locations](http://gov.nl.ca/dgsnl/department/contact/#locations).



Bacteriological sample bottle



Chemical and physical parameter sample bottles



## Chemical and Physical Parameters: Results

Results for chemical and physical parameters are sent to the department when laboratory analysis is complete. The department then evaluates the results by comparing them to current Guidelines for Canadian Drinking Water Quality (GCDWQ). Water quality results are compared to the GCDWQ to identify exceedances in chemical and physical parameters that may pose a risk to human health or aesthetic approval of drinking water.

Table 11 summarizes the tap water bacteriological, chemical and physical parameter exceedances for fiscal years 2017–18, 2018–19 and 2019–20. When an exceedance is confirmed for a parameter that may pose a risk to human health, an exceedance report is promptly provided to the community, as well as the departments of Health and Community Services and Digital Government and Service NL. Exceedances for aesthetic parameters are also reported to communities, along with all other parameter results, in quarterly drinking water quality updates. Communities and the public can access this drinking water quality data through the WRMD's Water Resources Portal online at: [maps.gov.nl.ca/water/](https://maps.gov.nl.ca/water/). WRMD's sampling and reporting procedures are in the Drinking Water Quality Monitoring Manual, which can be viewed at: [gov.nl.ca/ecc/waterres/quality/drinkingwater/manual/](https://gov.nl.ca/ecc/waterres/quality/drinkingwater/manual/)

Parameters with new guidelines such as copper and manganese shall be monitored over time to determine the level of exceedances within the province and any increasing or decreasing trends over time. As with any contaminant, the province will work with communities to provide guidance on corrective measures.

## Data Management and Reporting

The large volume of data acquired during the implementation of the various components of the MBSAP must undergo a stringent quality assurance/quality control (QA/QC) process before it can be compiled, analyzed, and reported to the public. The WRMD strives to collect quality data and report it to the public in an open and timely manner. Table 12 summarizes the reports used to communicate the results from programs related to drinking water quality.

**Table 11: Exceedances per Fiscal Year**

Department	Exceedances					
	Parameters	2017-18	2018-19	2019-20	Per cent of Samples Collected with Exceedances for 2019-20 (%)	
Digital Government and Service NL	Bacteriological	Escherichia coli	137	109	137	0.73
		Total coliforms	730	656	579	3.10
Environment and Climate Change	Chemical and Physical	Turbidity	71	96	68	5.74
		Arsenic	4	5	5	0.42
		Barium	0	0	0	0.00
		Fluoride	1	1	2	0.17
		Copper	*	*	0	0.00
		Lead	4	1	8	0.68
		Manganese	*	*	40	3.38
	Disinfection By-Products	Trihalomethanes (THMs)	145	112	99	8.45
		Haloacetic Acids (HAAs)	144	134	92	7.86
	Aesthetic	Colour	478	437	419	35.36
		pH	294	221	168	14.18
		Total Dissolved Solids	15	16	9	0.76
		Chloride	11	6	4	0.34
		Manganese	78	48	193	16.29
		Sodium	9	2	3	0.25
Sulphate		1	2	1	0.08	
Iron	135	71	105	8.86		

\*New GCDWQ for copper (contaminant) and Mn (contaminant, revised aesthetic) established in 2019-20



## HIGHLIGHT

### Revised Manganese Guideline(s) for Canadian Drinking Water Quality (GCDWQ)

Manganese is an essential nutrient found naturally in the environment. Manganese gets into drinking water sources when water dissolves minerals that contain manganese. Manganese is found in water supplies throughout the province of Newfoundland and Labrador.

Health Canada worked with provinces, territories and other federal departments to set a new contaminant guideline value for manganese in drinking water of 0.12 mg/L. The guideline value is protective of the health of Canadians, including the most vulnerable members of society, such as infants and children. Manganese has long been considered to be an aesthetic concern in drinking water, because it discolours water and can stain laundry or fixtures. As such, Health Canada has established an aesthetic objective of 0.02 mg/L. The Guidelines for Canadian Drinking Water Quality for Manganese are based on recent scientific studies and set out the basic parameters that every water authority should strive to achieve in order to provide the cleanest, safest and most reliable drinking water possible.

Manganese will not enter the body through the skin or by breathing in vapours while showering or bathing. Bathing and showering in water that contains levels of manganese above the guideline value is considered safe. Drinking water that contains high levels of manganese, even for a short time, can be a health risk to infants. Formula-fed infants may be especially at risk if the water used to prepare the formula contains levels above the guideline value. If you are pregnant, breastfeeding or preparing infant formula and are concerned about your infant's exposure to high levels of manganese in drinking water, it is recommended that you use an alternate source of drinking water and/or install a treatment device to remove manganese from drinking water.

There are two categories of treatment units capable of reducing manganese in water in your home:

- units installed directly at the tap: used to reduce specific contaminants at one tap only (point of use units), and
- units installed where the water supply enters the home: used to reduce specific contaminants in water for the entire household (point of entry units).

More information on manganese and manganese monitoring in drinking water systems is available at: [gov.nl.ca/ecc/files/waterres-quality-drinkingwater-pdf-manganese-water-talk.pdf](http://gov.nl.ca/ecc/files/waterres-quality-drinkingwater-pdf-manganese-water-talk.pdf)



**Table 12:** Types of Public Reports Produced by the Department

Type	Description
<p><b>Seasonal Community Drinking Water Quality Updates</b></p>	<p>The department uses paperless reporting for all communities with public drinking water systems. Communities are sent an email when seasonal data is updated. The data is available on the Water Resources Portal. These reports clearly indicate any parameters that exceed the Guidelines for Canadian Drinking Water Quality. The province recommends that communities post these reports in public locations. In the 2019–20 fiscal year, 1,112 seasonal community updates were available through the portal.</p>
<p><b>Exceedance Reports</b></p>	<p>Exceedance reports are provided to communities when a chemical analysis result is above the Guidelines for Canadian Drinking Water Quality for a contaminant. These reports are emailed, faxed or mailed to the affected community as soon as the department receives the results. In the 2019–20 fiscal year, fifty-five exceedance reports (five arsenic, eight lead, two fluoride and forty manganese) were sent to communities.</p>
<p><b>Annual Drinking Water Safety in Newfoundland and Labrador Report</b></p>	<p>The Annual Drinking Water Safety in Newfoundland and Labrador Report has been published each year since 2001. It outlines accomplishments and activities under the Multi-Barrier Strategic Action Plan for drinking water safety in a particular fiscal year. Annual reports are available at: <a href="http://gov.nl.ca/ecc/waterres/reports/">gov.nl.ca/ecc/waterres/reports/</a></p>
<p><b>Web Documents on Drinking Water Quality</b></p>	<p>The WRMD’s website is an important tool used to communicate with the public. It is updated regularly with new information on drinking water quality and related topics. The “News and Highlights” page, lists the most current information and is available at: <a href="http://gov.nl.ca/ecc/waterres/whatsnew/">gov.nl.ca/ecc/waterres/whatsnew/</a></p>

## Inspection and Enforcement

The Water Resources Act states that a permit holder shall allow inspectors to carry out inspections of an activity for which a license or permit has been issued. Investigations can also occur once the department is made aware of a contravention of the Water Resources Act or associated regulations and permits. Departmental staff conduct inspections of water supply systems under construction, the operation of water treatment and distribution systems, groundwater wells being drilled, and activities taking place in PPWSAs to ensure that they comply with the terms and conditions of the permit. Communities should conduct routine surveillance and monitoring for approved development activities within PPWSAs to ensure existing activities are being conducted in an environmentally acceptable manner and that there are no development activities taking place without prior approval from the department. Investigations are typically issue-specific.

In the 2019–20 fiscal year, departmental staff carried out a total of 115 inspections/investigations. In addition, staff visited public water supplies two to four times a year during scheduled monitoring work. Table 13 presents a breakdown of inspections for 2019–20.

**Table 13: Inspections by the Department for 2019–20**

Protected Surface Water Supplies	Water and Sewer	Protected Groundwater Supplies*	Total
1	8	106	115

\*Groundwater source samples and inspections completed.

One of the department’s main goals is to ensure communities achieve clean and safe drinking water in a sustainable and efficient manner. When non-compliance with the Water Resources Act or conditions of a permit is reported, the WRMD responds to enforce the permit.

### Operator Education, Training, and Certification

Certified operators are integral to the proper operation and maintenance of the systems that supply clean and safe drinking water to the consumer. Through continuing education, training, and certification, the department addresses the need for qualified drinking water treatment and distribution system operators in this province. During the 2019–20 fiscal year, 22 drinking water related classroom seminars were held at seven locations across the province.

#### Operator Training

The operator training program provides municipal drinking water system operators with hands-on training opportunities. The program utilizes three mobile training units that have been equipped with various equipment and tools used in the operation and maintenance of drinking water systems. Training sessions are delivered on-site in the operator’s community to maximize accessibility to the training opportunities. During 2019–20, the province’s three operator trainers conducted 113 on-site training sessions throughout the province. These sessions were attended by a total of 196 participants.

#### Operator Certification

Certification is an essential component for the operation of a safe drinking water system. There are 562 certified water or wastewater operators in Newfoundland and Labrador. Seventy operators achieved their first level of certification in 2019–20. Table 14 contains the total number of operator certificates issued by classification.

**Table 14:** Total Number of Operator Certificates Issued for 2019–20

Water Distribution	Water Treatment	PWDU	Very Small Water Systems	Wastewater Collection	Wastewater Treatment	Total Certificates
50	16	6	2	46	6	126

Table 15 summarizes the number of communities in Newfoundland and Labrador that employ at least one certified operator divided by classification.

**Table 15:** Number of Communities Employing Certified Operators

Water Distribution	Water Treatment	Potable Water Dispensing Units	Very Small Water Systems	Wastewater Collection	Wastewater Treatment
138	25	14	4	63	26

\*The above numbers do not include industrial facilities that employ certified operators - only municipalities.

### Annual Clean and Safe Drinking Water Workshop

The Annual Clean and Safe Drinking Water Workshop has been ongoing since 2001. The workshop is open to all community operators and administrators and attracts participants from across the province and country. It provides drinking water quality stakeholders with opportunities to learn about drinking water safety, to exchange information, and to share experiences. The presentations delivered throughout this event are carefully chosen to address specific challenges faced by small communities in providing clean and safe drinking water.

The 2020 Clean and Safe Drinking Water Workshop originally scheduled for March 24-26, 2020 was cancelled due to the COVID-19 pandemic.

## HIGHLIGHT

### 2020 Operator of the Year Awards

Department of Environment and Climate Change created the Operator of the Year Awards to recognize the outstanding dedication of municipal operators in providing clean and safe drinking water. Community representatives across the province were invited to nominate an operator they felt had made an outstanding contribution. In total, 16 nominations were submitted to the selection committee for consideration in two categories: Volunteer Operator of the Year and Operator of the Year.

The Volunteer Operator of the Year Award was created to honour an individual that operates a public water supply system without monetary compensation. The 2020 Award was presented to Mr. Dennis Ivany from the Local Service District of Petley. Mr. Ivany has been a volunteer water system operator for four years. He is committed to ensuring the residents of Petley are provided with safe drinking water, and often visits the chlorination facility a couple of times per day. Dennis always volunteers his services whenever he is needed.

The 2020 Operator of the Year Award was presented to Mr. Andrew Edwards, Water Treatment Plant Operator with the Town of Marystown. Andrew started his role as a Water Treatment Plant Operator in 2011. He worked alongside multiple contractors and engineers as the plant was being constructed and commissioned to ensure he had a complete understanding of the plant. In 2018, Mr. Edwards achieved his Class 4 Water Treatment certification. Andrew is a dedicated water treatment plant operator and his commitment to the residents of Marystown goes above and beyond.



Mr. Dennis Ivany, 2020 Volunteer Operator of the Year



Mr. Andrew Edwards, 2020 Operator of the Year

## Corrective Measures

The Level II components of the MBSAP provide an ongoing picture of drinking water supply, quality, and infrastructure. The issues identified require the implementation of corrective actions to deal with these challenges. Corrective measures can include structural, non-structural, operational techniques and other best management practices. There are five classes of corrective measures: policy, design, water system management, water treatment alternatives, and source alternatives. Table 16 shows the progress made in each category of corrective measures.

**Table 16:** Corrective Measures Undertaken for 2019–20

Corrective Measure	Description
<b>Policy</b>	<ul style="list-style-type: none"> <li>Year 19 of the Multi-Barrier Strategic Action Plan for Safe Drinking Water in Newfoundland and Labrador.</li> <li>Interdepartmental Safe Drinking Water Technical Working Group met 3 times during 2019-20 (May 22, 2019, October 10, 2019, and December 18, 2019). One meeting was cancelled on March 12, 2020.</li> </ul>
<b>Design</b>	<ul style="list-style-type: none"> <li>Updating the Newfoundland and Labrador Guidelines for the Design, Construction and Operation of Water and Sewerage Systems to the Newfoundland and Labrador Guidelines for the Design of Drinking Water Systems underway.</li> <li>Participation on the committee updating the Atlantic Canada Guidelines for the Supply, Treatment, Storage, Distribution and Operation of Drinking Water Supply Systems.</li> </ul>
<b>Water System Management</b>	<ul style="list-style-type: none"> <li>Ongoing operator education, training and certification</li> <li>Permits to Construct issued relating to water system management:               <ul style="list-style-type: none"> <li>New or upgraded watermains- 87</li> <li>New or upgraded pumps or pumphouses- 4</li> <li>New or upgraded valves- 2</li> <li>New or upgraded flow meters- 5</li> <li>New or upgraded hydrants/flush hydrants- 4</li> <li>New or upgraded intakes or screens- 3</li> <li>New or upgraded storage tanks- 6</li> </ul> </li> <li>5 Permits to Operate issued for drinking water systems (Gillams, Burgeo, Ramea, Deer Lake, and Pasadena).</li> <li>Detailed inspections were conducted for 7 drinking water systems (Long Harbour-Mount Arlington Heights, Port aux Basques, Pasadena, Deer Lake, Lourdes, Ramea, and Burgeo).</li> </ul>
<b>Water Treatment Alternatives</b>	<ul style="list-style-type: none"> <li>Permits to Construct issued relating to water treatment:               <ul style="list-style-type: none"> <li>New chlorination systems- 3</li> <li>Chlorination system upgrades- 1</li> <li>New Potable Water Dispensing Unit (PWDU)- 1</li> <li>New pH adjustment system- 1</li> <li>New arsenic removal system- 1</li> <li>Dam or reservoir upgrades- 1</li> <li>New or upgrades SCADA- 1</li> </ul> </li> <li>Pouch Cove – new water treatment plant commissioned</li> </ul>
<b>Source Alternatives</b>	<ul style="list-style-type: none"> <li>Permit to Construct issued to Town of Colliers to start the process of switching from a groundwater to a surface water source.</li> </ul>



## LEVEL III

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The management of drinking water depends on the contribution of several levels of government as well as the public. The four components in Level III of the MBSAP are:

1. Legislative and policy frameworks
2. Public involvement and awareness
3. Guidelines, standards and objectives
4. Research and development

### Legislative and Policy Frameworks

The legislation that governs public drinking water systems in the province includes the Water Resources Act, the Municipal Affairs Act, and the Municipalities Act. All of the legislation, policy directives, standards, and regulations relating to drinking water systems are posted on the province's website. These three Acts contain broadly stated initiatives:

1. The Water Resources Act regulates the administration of water rights, the protection of public water supply areas, and a range of construction, operation, and development permits pertaining to drinking water infrastructure and development that may impact public water supplies.
2. The Municipal Affairs Act administers the management of waterworks.
3. The Municipalities Act grants powers to municipalities for the construction, operation, and maintenance of water systems and for the allocation of funds for this work.

Government also introduces regulations, guidelines and policy directives to provide more explicit direction for legislation.

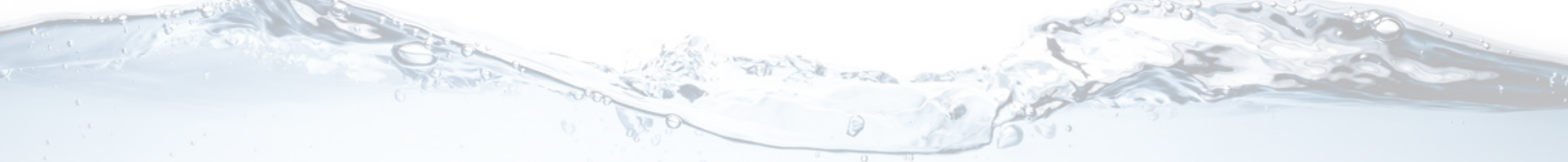
### Interdepartmental Cooperation

The Provincial Government's efforts to provide clean and safe drinking water are the result of the combined contributions of the departments of Environment and Climate Change, Health and Community Services, and Digital Government and Service NL. Each department is responsible for various aspects of the MBSAP. Their efforts are coordinated by an interdepartmental committee of ministers, which is chaired by the Minister of Environment and Climate Change. The committee's work is supported by the committee of deputy ministers and the Interdepartmental Safe Drinking Water Technical Working Group, which was formed in June 2000. Medical Officers of Health and representatives from the Public Health Laboratory are also members of the working group. The working group leads work on the development of policy and guidelines relating to drinking water safety.

In 2019-20, the working group continued to focus efforts on reducing the number of active BWAs in the province, and improvements to the Public Health Laboratory. Other collaborative efforts included developing guidance on water conservation, what to do if flooding affects your water supply, what steps should be taken during a waterborne disease outbreak, and point of use/point of entry water treatment devices.

### Public Involvement and Awareness

The department continues to provide accessible and timely drinking water quality information to the public. The department's website is a major tool for increasing public awareness and encouraging public involvement. Watershed management committees are another way the public can participate in efforts to ensure clean and safe drinking water supplies. They are excellent forums in which stakeholders can voice opinions and concerns about land management and water quality issues in their watershed areas.



The establishment of watershed management committees furthers the goals of increasing public involvement and awareness of drinking water safety issues. Sessions from the BWA Reduction Initiative community workshops can be found on the NL Water Resources channel at [youtube.com/user/nlwaterresources](https://youtube.com/user/nlwaterresources). The videos have been developed as part of the BWA Reduction Initiative strategy for communities, water system operators, and the general public.

## Guidelines, Standards and Objectives

To ensure clean and safe drinking water, the department sets drinking water safety guidelines, standards, and objectives, and regularly reviews and updates them to address current issues and challenges. Current provincial water quality guidelines and standards are available on the following website: [gov.nl.ca/ecc/waterres/regulations/policies/](https://gov.nl.ca/ecc/waterres/regulations/policies/)

As treatment technologies and initiatives are implemented in the province, WRMD will continue to review and update the following inventories:

- Water Treatment Plant inventory
- Potable Water Dispensing Units inventory

Other guidelines and best management practices relating to the design and operation of drinking water systems can be found here: [gov.nl.ca/ecc/waterres/waste/community/](https://gov.nl.ca/ecc/waterres/waste/community/)

## Research and Development

In order to stay on top of current and emerging issues that affect drinking water safety, the department undertakes several research and development activities each year. During 2019–20, the following studies were implemented:

- BWA Reduction Initiative Study – Delivery of Mentoring Program for the Reduction of BWAs in Newfoundland and Labrador
- Evaluation of Point of Use/Point of Entry Water Treatment Systems in Newfoundland and Labrador
- Evaluation of New Drinking Water Filtration Systems in Newfoundland and Labrador
- Analysis of Manganese Speciation from Newfoundland and Labrador Public Drinking Water Sources

## Weblinks:

Department of Environment and Climate Change  
[gov.nl.ca/ecc/](http://gov.nl.ca/ecc/)

Newfoundland and Labrador Water Resources Act  
SNL 2002 cW-4.01  
[assembly.nl.ca/Legislation/sr/statutes/w04-01.htm](http://assembly.nl.ca/Legislation/sr/statutes/w04-01.htm)

Water Resources Management Division Reports  
and Publications  
[gov.nl.ca/ecc/waterres/reports/](http://gov.nl.ca/ecc/waterres/reports/)

Newfoundland and Labrador Water Resources Portal  
[gov.nl.ca/ecc/waterres/portal/](http://gov.nl.ca/ecc/waterres/portal/)

Protected Water Supply Area List and GIS Layers  
[gov.nl.ca/ecc/waterres/gis/](http://gov.nl.ca/ecc/waterres/gis/)

Guidelines for Canadian Drinking Water Quality:  
Summary Table  
[canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html](http://canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html)

Drinking Water Treatment Standards for Newfoundland  
and Labrador  
[gov.nl.ca/ecc/files/DW-Treatment-Standards-for-NL-April-2021.pdf](http://gov.nl.ca/ecc/files/DW-Treatment-Standards-for-NL-April-2021.pdf)

Guidelines for Drinking Water Quality  
in Newfoundland and Labrador  
[gov.nl.ca/ecc/files/Guidelines-for-DWQ-in-NL-Sept-2020.pdf](http://gov.nl.ca/ecc/files/Guidelines-for-DWQ-in-NL-Sept-2020.pdf)

Policy for Drinking Water Quality Monitoring  
and Reporting for Public Water Supplies  
[gov.nl.ca/ecc/waterres/regulations/policies/water-quality/](http://gov.nl.ca/ecc/waterres/regulations/policies/water-quality/)

Department of Environment and Climate Change  
Drinking Water Quality Data  
[gov.nl.ca/ecc/waterres/quality/drinkingwater/chemical/](http://gov.nl.ca/ecc/waterres/quality/drinkingwater/chemical/)

Acts, Regulations, Policy Directives,  
and Water Quality Standards  
[gov.nl.ca/ecc/waterres/regulations/policies/](http://gov.nl.ca/ecc/waterres/regulations/policies/)

Education, Training, and Certification  
[gov.nl.ca/ecc/waterres/training/](http://gov.nl.ca/ecc/waterres/training/)

Guidelines for the Design, Construction, and Operation  
of Water and Sewerage Systems  
[gov.nl.ca/ecc/waterres/waste/groundwater/report/](http://gov.nl.ca/ecc/waterres/waste/groundwater/report/)

Best Management Practices for the Control of Disinfection  
By-products in Drinking Water Systems in Newfoundland  
and Labrador  
[gov.nl.ca/ecc/waterres/reports/cwws/](http://gov.nl.ca/ecc/waterres/reports/cwws/)

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