DRINKING WATER SAFETY

IN

NEWFOUNDLAND AND LABRADOR

ANNUAL REPORT 2003

GOVERNMENT OF
NEWFOUNDLAND AND LABRADOR
Department of Environment

ACKNOWLEDGEMENTS

Sincere thanks is extended to the staff of the Water Resources Management Division particularly, Haseen Khan, Amir Ali Khan, Keith Guzzwell, Paul Neary, Rob Holloway, Renée Paterson and Kent Slaney for their commitment, hard work and dedication in the completion of this report. I would also like to recognize and appreciate the efforts of the management and front-line staff of the four line departments, Health and Community Services Boards, municipal governments, and the Newfoundland and Labrador Federation of Municipalities in the implementation of the Multi-Barrier Strategic Action Plan for drinking water safety. I also want to recognize the efforts of the members of the Drinking Water Safety Technical Working Group for their work in dealing with drinking water issues. The group's members are Robert Newhook, Roger LeDrew, Sam Ratnam, Darryl Johnson, Lori-Anne Legge and David Allison.

Martin Goebel
Director of Water Resources Management Division
Chair of Drinking Water Safety Technical Working Group

EXECUTIVE SUMMARY

This drinking water safety report outlines accomplishments and activities for 2002-03 under the Multi-Barrier Strategic Action Plan (MBSAP) for drinking water safety.

Substantial progress has been made in the implementation of the MBSAP for drinking water safety over the past year. Some of the highlights include:

- the designation of 12 new protected water supply areas,
- digitization of public water supply areas,
- investment of over $120.41 million on various water and sewer related projects to date,
- continued routine monitoring of drinking water quality for all public water supply systems,
- provision of quarterly and annual water quality reports to all communities,
- improved reporting of drinking water quality data,
- a reduction in the number of boil water advisories,
- resolution of drinking water quality issues (pH, colour, turbidity, arsenic, fluoride, lead and trihalomethanes) in a number of communities,
- improvements in regulatory approval and inspection systems,
- development of an arsenic risk map of the island portion of the province,
- delivery of operator education and training through classroom sessions and hands-on training sessions.

During the 2002-03 fiscal year, Government allocated $1.5 million for drinking water initiatives to ensure safe drinking water throughout Newfoundland and Labrador. In addition, $55.8 million was spent on capital infrastructure. The Department of Environment spent $530,000 to implement phase two of its community based operator education and training program and to support the drinking water quality monitoring program. In addition to capital infrastructure funding, the Department of Municipal and Provincial Affairs also hired three Community Water and Wastewater Specialists. The department also provided financial assistance to communities attending the training, workshop and certification courses relating to drinking water safety. The Department of Government Services and Lands hired seven Environmental Health Officers in 2002-03. The Department of Health and Community Services spent nearly $500,000 to increase the capacity of the Newfoundland Public Health Laboratory, to hire an Environmental Health Specialist and to provide funding for the Health Labrador and Grenfell Regional Health Services to hire a shared Environmental Health Coordinator.

The Drinking Water Safety Technical Working Group met on a regular basis throughout the year to deal with drinking water issues. They have accomplished, amongst other things, the revision of provincial standards for bacteriological quality of drinking water, the evaluation of bacteriological sampling regimes and current boil water advisories, as well as the coordination of provincial budgetary submissions.

In addition to the progress and accomplishments in 2002-03, this report outlines the proposed path forward to continue with the implementation of the MBSAP to help ensure the safety of our drinking water.

TABLE OF CONTENTS

1 INTRODUCTION

1.1 Overview

This is the second annual report on the safety of drinking water quality in the province. It provides information on the progress and accomplishments made to ensure drinking water safety. This report was prepared in fulfilment of the Department of Environment's commitment to issue an annual progress report on drinking water safety for the Province.

Clean and safe drinking water is being provided to the public by implementing what is referred to as a multi-barrier strategic action plan (MBSAP) for drinking water safety. This plan simply refers to the protection of drinking water on a variety of levels. The components of the MBSAP as shown in **Figure 1** include: source protection, water treatment, water distribution supply systems, comprehensive drinking water quality monitoring, data management and reporting, appropriate inspection, abatement and enforcement measures, and operator education and training. These key elements are further complemented by:

- inter-departmental cooperation
- research and development
- guidelines, standards and objectives development
- legislative and policy frameworks
- public involvement and awareness

Figure 1 also shows the participating agencies for each key element of the MBSAP. The primary goal is to ensure that adequate safeguards are in place at each stage of the water supply system to minimize the possibility of pathogens and other contaminants entering the water and thus ensuring the safety of drinking water. Additional goals of the action plan are to provide public access to drinking water quality data, ensure open and transparent communication with the public on all drinking water quality related issues, restore public confidence in drinking water, and ensure long term sustainability of water supply systems.

To implement the MBSAP for drinking water safety effectively, four government departments are working together. A committee of Deputy Ministers deals with drinking water safety on a proactive basis. The committee is chaired by the Deputy Minister of Environment, and includes the Deputy Ministers of Health and Community Services, Municipal and Provincial Affairs, and Government Services and Lands. The committee is supported by an inter-departmental Safe Drinking Water - Technical Working Group (SDW TWG).

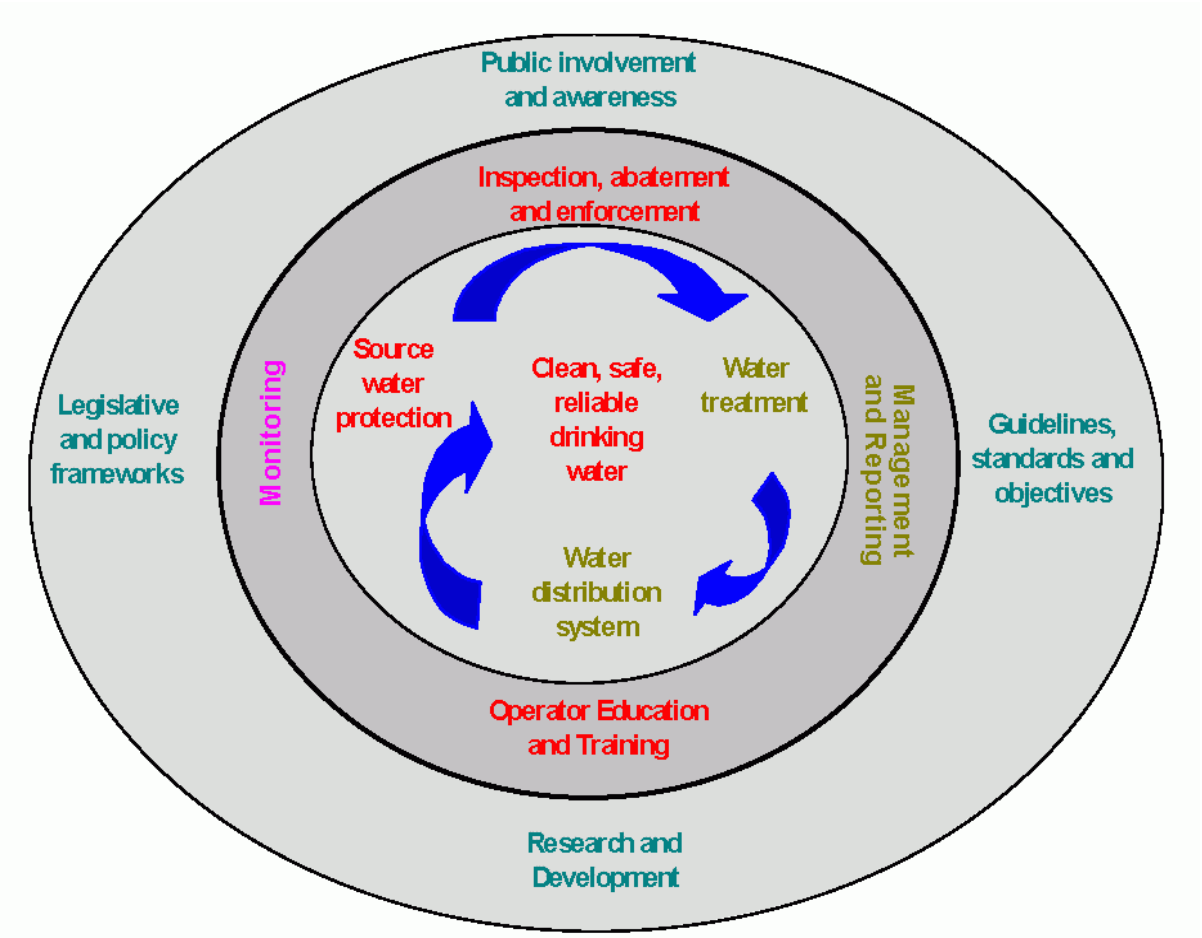
Under the leadership of the Deputy Minister's committee, the departments have made substantial progress in implementing the MBSAP for drinking water safety. The details of which are documented in this report.

1.2 Objectives

The main objective of this report is to provide an overview of the progress of activities on each component of the MBSAP for drinking water safety. The highlights of the various sections of the report are as follows:

- **Section 2** provides details of the challenges and issues facing the implementation of the MBSAP for drinking water safety.
- **Section 3** provides details of the progress and accomplishments of implementing the MBSAP during the past year.
- **Section 4** provides details of the proposed activities or the path forward for the next fiscal year in order to provide clean, safe and secure drinking water.

Figure 1: The components of the Multi-Barrier Strategic Action Plan (MBSAP)



2 CHALLENGES AND ISSUES

2.1 Diversity of Water Supply Systems

In the 2001 census, Statistics Canada estimated the population of Newfoundland and Labrador to be 512,930. Population figures used in this report are derived from this census data. Approximately 90% of the population is concentrated along the coastline which is 17,540 kilometres long. The current water supply database lists 614 communities, 535 public drinking water sources and 567 public water supply systems as shown in **Figure 2**.

Many communities have more than one water supply system and 228 communities do not have a public water supply system. Residents in these communities generally use private wells to meet their water needs. According to the water system classification developed by the Association of Boards of Certification, the 567 water supply systems can be categorized as 520 small systems, 43 medium systems, three large systems and one very large system. The majority of the small water supply systems service in the range of 150 to 500 people. The distribution of different population sizes of water supply systems is shown in **Figure 3**.

There are 315 surface water sources which service the majority of the population of the province. This is due to the reliability of surface water supplies and easy access to a large number of lakes and ponds.

There are 220 groundwater sources consisting of both dug and drilled wells. Dug wells are usually between two and five metres deep, depending on the depth at which bedrock is encountered. The depth of drilled wells ranges from about 15 to 150 metres. Groundwater wells are the water supply of choice for most smaller communities and for augmenting systems where distribution costs are prohibitive.

The large number of communities, and a relatively small population base spread over a large geographical area, makes the administration of public water supply systems and the provision of safe drinking water a challenging task. Small communities are often constrained by technical and financial resources due to size, remote location, and limited tax base. Consequently, these small systems are often at higher risk of water system malfunction. To address these issues the Department Municipal and Provincial Affairs and the Department of Environment are encouraging the concept of regional water systems and regional water operators.

Figure 2: Number of Communities, Sources and Systems

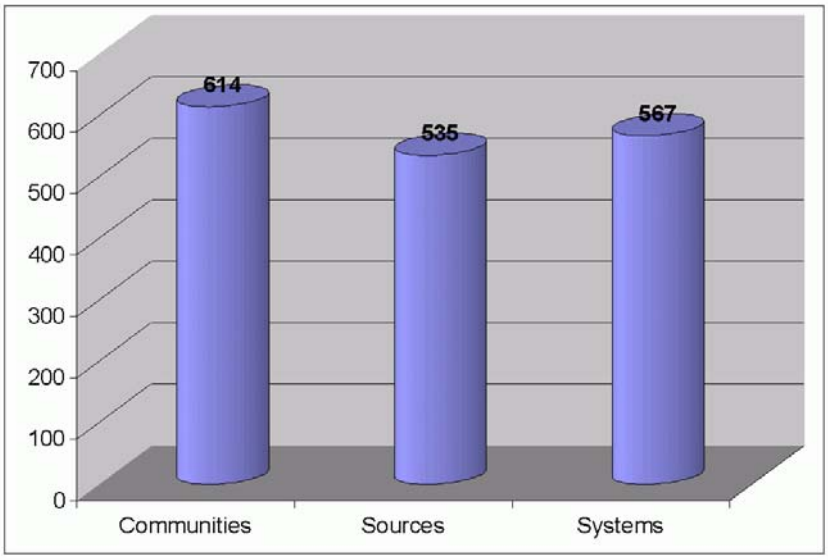
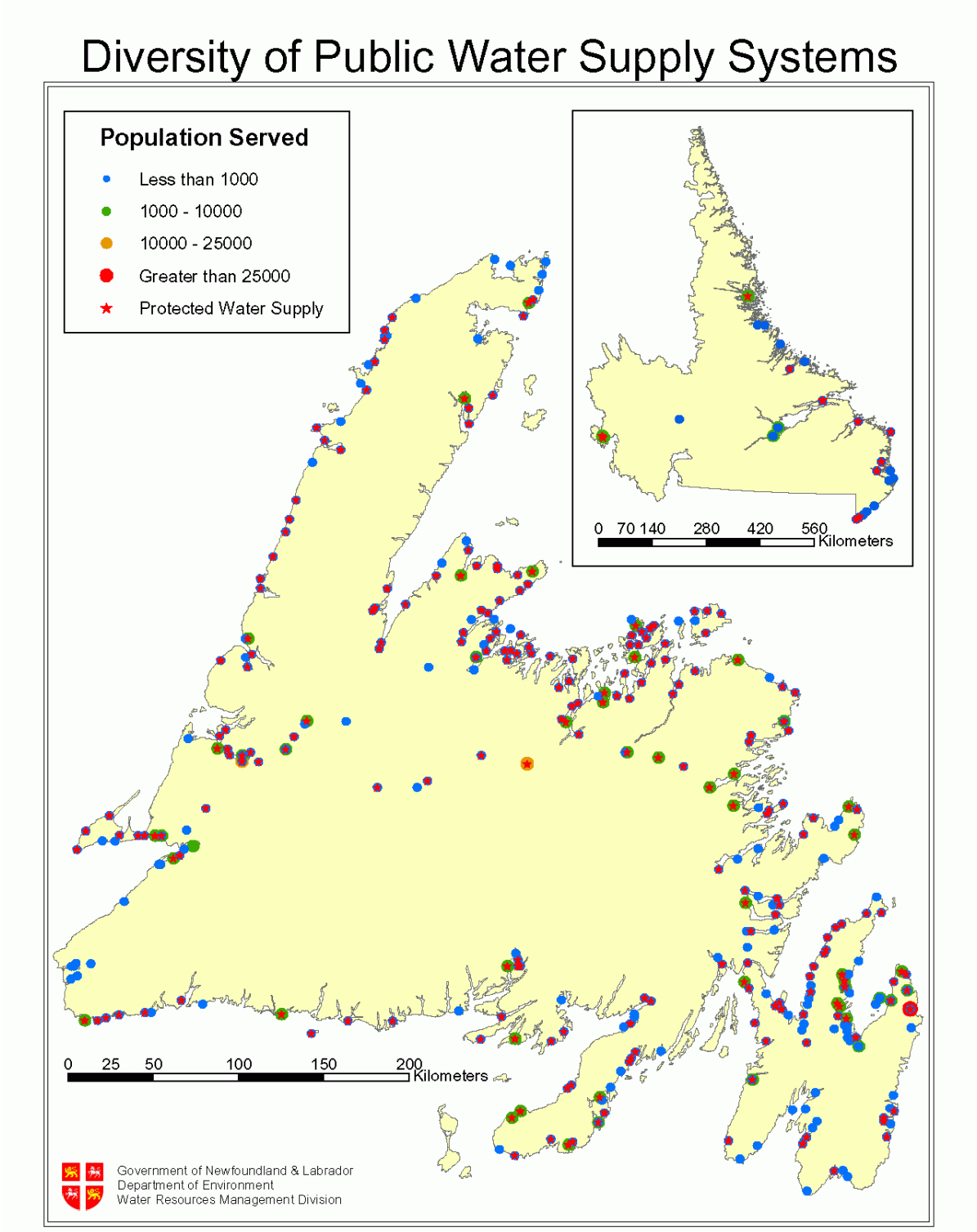


Figure 3: Public Water Supplies



2.2 Water Quality Indicators

2.2.1 Chemical Indicators

Based on the information and knowledge gained through regulatory inspections and the drinking water quality monitoring program, the main challenges and issues with respect to chemical indicators of drinking water quality identified in 2002-03 are the same as those reported in the last annual report:

- Aesthetic parameters - pH, colour and others
- Contaminants - which are substances or health related parameters as described in the *Guidelines for Canadian Drinking Water Quality* such as arsenic, lead and turbidity
- Trihalomethanes (THMs)

Aesthetic Parameters

There are a number of aesthetic parameters such as pH, colour, iron, manganese and copper whose values sometimes fall outside the recommended guidelines. Aesthetic parameters reflect substances or characteristics of drinking water that can affect its acceptance by consumers but which usually do not pose any health effects. Improvement of aesthetic parameters contributes to the overall quality and public confidence in drinking water.

pH - There are about 24 communities where pH values are below 5.0 which is considered acidic. Although this does not have direct health implications, low pH levels accelerate corrosion of pipes and fittings and the leaching of metals. There are about 12 communities where pH values are above the recommended guideline of 8.5. High pH levels often cause scale deposition in piping and enhance THMs formation.

Communities with very low or high pH were advised to adjust their pH systems. The adjustment and optimization of pH will enhance drinking water quality. It will also prolong the life of the distribution system by reducing corrosion. pH control reduces the dissolution of metals from the distribution system, and thus reduces the concentrations of metals in drinking water.

Colour - The other main aesthetic parameter of concern is colour. There are about 232 communities with colour values above the recommended guideline of 15 True Colour Units (TCU). Colour in drinking water may be due to the presence of coloured organic substances or metals such as iron, manganese and copper. The presence of colour is not directly linked to health concerns but it is aesthetically displeasing. This is also of additional concern because the presence of colour in water is an indirect indicator of the THMs formation potential when the water is chlorinated.

Bogs and wetlands produce large amounts of dissolved organic materials such as tannins, lignins and humic acids, which can give water a tea-like colour. Calcium carbonate from regions with limestone bedrock may give water a greenish colour, while ferric hydroxide (iron) may impart a reddish colour. The degree of colouring will depend on the concentrations of these and other substances. Water colour is highly influenced by land cover in a basin. Bogs and wetlands drainage will contribute high levels of colour to surface runoff, while less organic soils or exposed bedrock in a basin will contribute little or no colour.

Others - Aesthetic parameters such as copper, iron and manganese were also reported above the recommended guidelines in some public water supply systems, which is typical of the geology of the province.

Contaminants

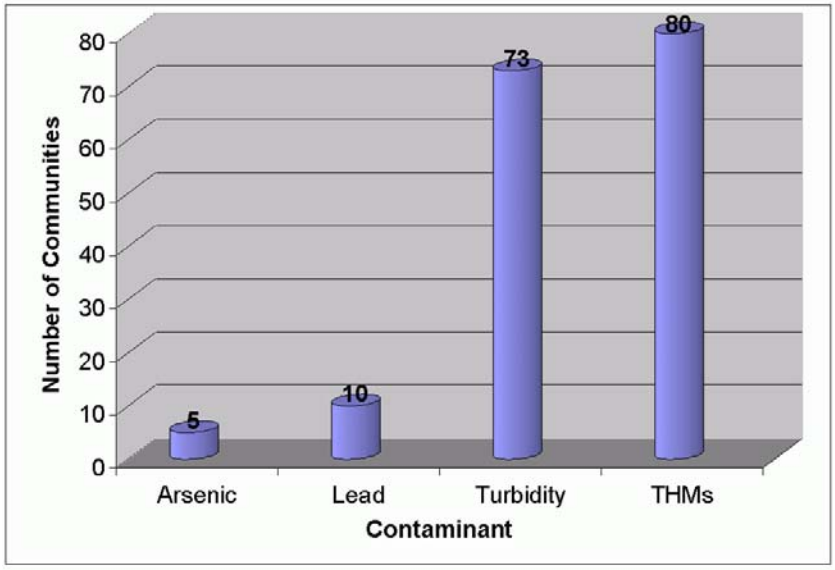
The main chemicals or parameters of concern in our public water supplies are: arsenic, lead, turbidity and THMs. **Table 1** shows the recommended guidelines for each of these parameters and **Figure 4** provides information on the total number of communities affected.

Arsenic - Five communities that are on groundwater based water supply systems were identified as being affected by naturally occurring arsenic. The recommended guideline for arsenic is 0.025 mg/L. Arsenic is the 20th most common element in the earth's crust and is known to occur in water in some Canadian provinces. The current information and water quality data on arsenic has been used to delineate the extent of arsenic levels. With this information one is able to propose appropriate mitigative solutions for affected areas and discourage the construction of new wells in areas with high background levels of arsenic.

Table 1: Number of Communities with Contaminant Exceedances

Contaminants	Recommended Guideline	Number of Communities
Arsenic	0.025 mg/L	**5**
Lead	0.01 mg/L	**10**
Turbidity	1.0 NTU	**73**
THMs	100 µg/L	**80**

Figure 4: Number of Affected Communities



Lead - Lead is another chemical of concern. Lead may occur in tap water as a result of dissolution from natural sources or more commonly, from distribution systems and plumbing containing lead in pipes, solder or service connections. The recommended guideline for lead in drinking water is 0.010 mg/L. Lead levels above the recommended guidelines were found in 10 communities.

Most lead exceedances in water samples are attributed to improper flushing of pipes and are thus not always representative of the water quality in the distribution system. While sampling protocols have been revised to ensure that pipes are properly flushed and water samples are taken that are representative of the water quality in the distribution system as a whole, in a few cases, local plumbing problems or low water usage at some sites require flushing to be carried out for longer periods than is usually done. Such sites will be identified on an ongoing basis and water sampling protocols for these sites will be modified to obtain better samples.

Experience is showing that repeat samples usually do not show a lead exceedance, confirming that the exceedance was most likely related to the sampling method rather than to an actual problem with the water quality in the distribution system. As a result of this, the exceedance reporting protocol for lead will be revised to report lead exceedances only if both the first and second samples indicate a lead exceedance. This revision will spare the public from the unnecessary inconvenience of being advised of a false positive report of a lead finding in the water supply system.

Turbidity - The other parameter of concern is turbidity. The Maximum Acceptable Concentration (MAC) in treated water is 1.0 NTU. High turbidity by itself is not considered a harmful condition, but its presence can reduce the effectiveness of disinfection.

Reducing turbidity in water supplies requires using good source control and treatment alternatives as appropriate. Groundwater wells usually do not exhibit turbidity, but if they do, it is a good indicator of surface

water influence. The source and cause of the problem needs to be assessed and recommendations made to the communities on appropriate corrective measures on an individual basis. A Canadian Water Quality Index based model is being developed to identify groundwater wells that exhibit turbidity. This will expedite the identification of wells that are potentially affected by surface water intrusion.

THMs - THMs formation is a common problem in surface-based public water supplies where the only water treatment is disinfection by chlorination. There are 87 serviced areas, affecting 80 communities, where THMs levels are above the recommended guideline of 100 µg/L. As shown in **Figure 5**, the total population exposed to THMs levels above the recommended guideline was 85,502.

Although the department has been successful in reducing the THMs levels in some communities, the number of communities with THMs levels above 100 µg/L continues to grow. This is because with growing public awareness about the benefits of disinfection, more communities are now chlorinating their water. THMs exceedances are usually not found in groundwater supplies due to low concentrations of organic precursors.

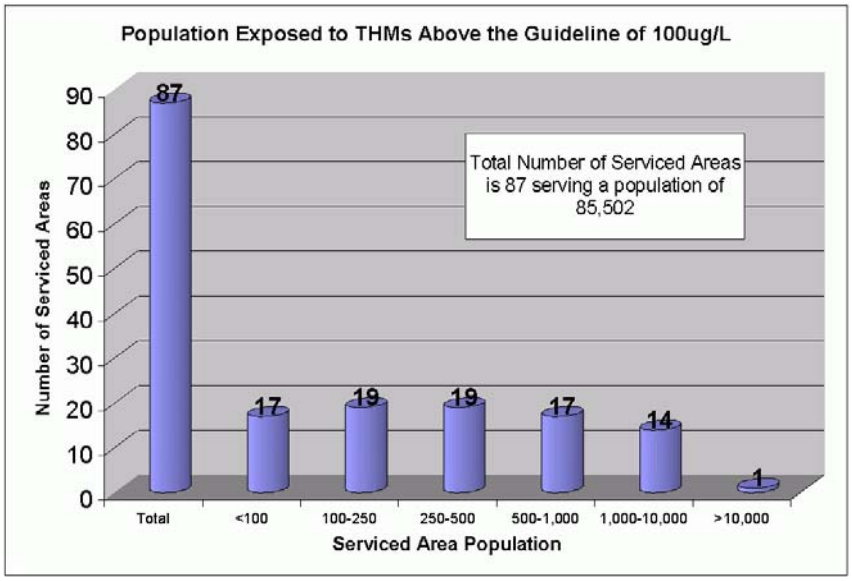
The department has made good progress in the implementation of a multi-component approach to THMs control as outlined in the report entitled "*Trihalomethane Levels in Public Water Supplies of Newfoundland and Labrador*", (Department of Environment, 2001).

2.2.2 Bacteriological Indicators (Boil Water Advisories)

The MBSAP includes a series of measures to ensure clean and safe drinking water is delivered to the public. However, occasionally, due to the failure of perhaps one or more standard barriers, it becomes necessary to take an additional final step to ensure that there is no microbiological contamination of drinking water. Disinfecting water by boiling is an effective way to protect public health, if the drinking water is of questionable microbiological quality.

There are many reasons why a boil water advisory may be issued. The most common reasons are that a public water supply has no chlorination or other disinfection system, or if there is one, it is not working properly. Water tests may indicate there is a problem with insufficient levels of residual disinfectant or of microbiological contamination eg., total coliforms or *E.coli*. A boil water advisory may be issued as a precaution whenever construction takes place on a watermain.

Figure 5: Summary for Trihalomethanes



Lastly, a boil water advisory may be issued because it is known that contamination may have occurred following a major watermain break, serious flooding, water treatment plant failure or because there is an outbreak due to waterborne agents such as *Giardia* in progress. These situations tend to occur rarely and corrective action can be taken quickly. There were no waterborne disease outbreaks in the province last year.

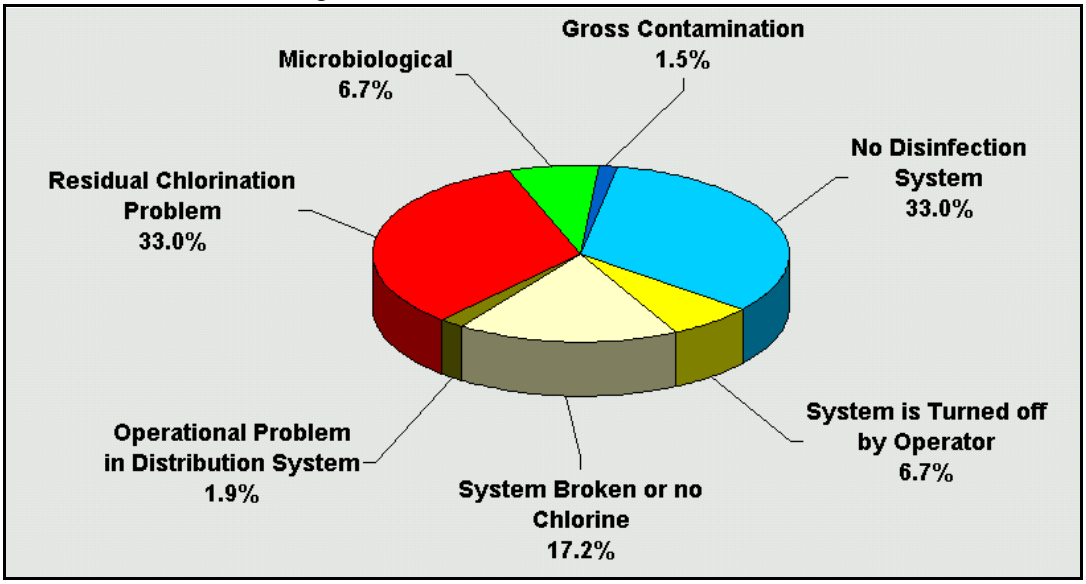
The number of boil water advisories currently (March 31, 2003) in effect for public water supplies in Newfoundland and Labrador is 267. These boil water advisories affect 181 communities in the province, many of which have more than one public water supply. On a population basis, this issue affects approximately 49,932 people (2001 Serviced population data). **Figure 6** illustrates the various reasons for boil water advisories. It should be noted that the number of boil water advisories issued primarily due to failure of microbiological test results is relatively low at 6.7% and furthermore, poor test results are largely the result of failure to properly disinfect the water.

Over the past year, the number of boil water advisories has shown a gradual declining trend as shown in **Figure 7**.

These figures, while they give a "snapshot " in time, do not reflect the fact that some water supplies were placed on a boil water advisory during the course of the year and were subsequently removed as problems were corrected. During 2002-03, 229 new boil water advisories were issued, many for only a brief period. During the same time, 269 boil water advisories were lifted once the problems were corrected. Slight discrepancies in the numbers are due to additional or abandonment of some water supplies. Additionally, these figures do not include any boil water advisories that were recommended for private water supply systems such as those owned by individuals, groups of individuals, commercial facilities or institutions.

The challenge for Government, municipalities and individuals is to correct the deficiencies that necessitate boil water advisories. From the preceding facts and figures it is evident that the provision of adequate primary disinfection and the proper operation of existing chlorinators are the key to ensuring safe drinking water. Once all public water supply systems become equipped with disinfection systems, and are operated by trained individuals, the number of boil water advisories will continue to decline significantly.

Figure 6: Reasons for Boil Water Advisories



2.3 Water Supply Infrastructure

The issues with respect to water supply infrastructure continue to be the same as those identified in the 2001-02 annual report. These issues include:

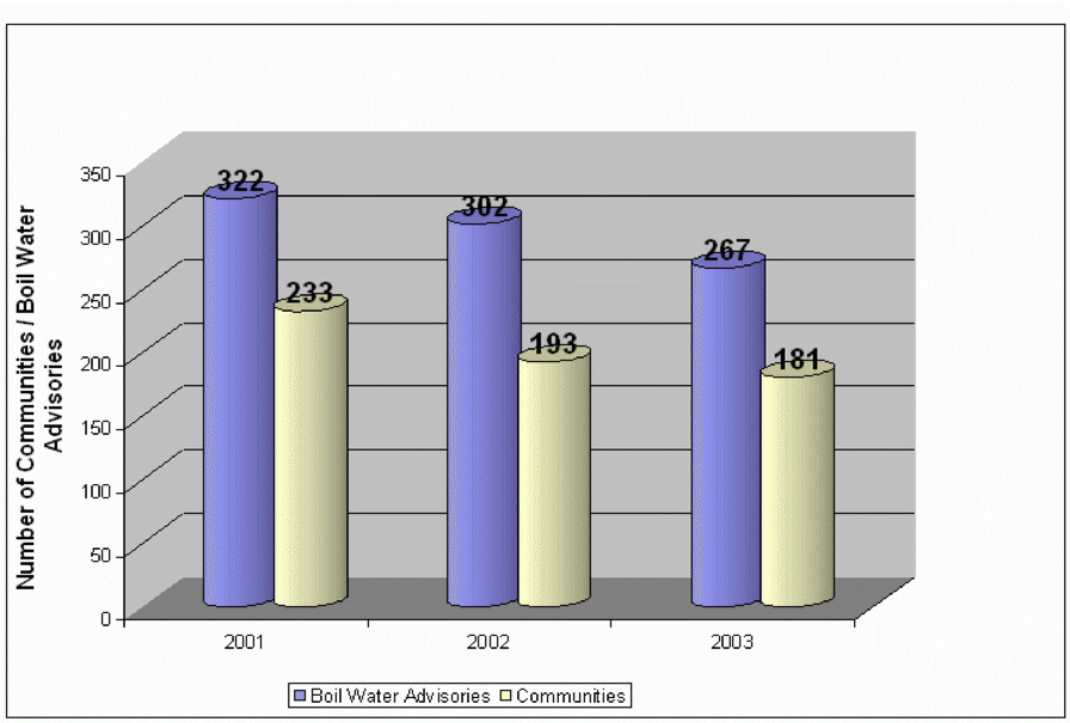
- lack of infrastructure ranging from simple chlorination systems to full water treatment plants where required to treat particular water problems, as well as servicing of areas presently not serviced.
- deteriorating infrastructure where water facilities and distribution systems are ageing and repair is becoming uneconomical.

2.4 Water System Operation and Maintenance

Chlorination continues to be the most widely used method of water disinfection and, with the exception of some water treatment plants, is the only water treatment used throughout the province. While chlorination is primarily aimed at destroying and rendering harmless disease-causing microorganisms, it also protects the distribution system from microbial growth. In addition to chlorination, there are a number of communities that are in the process of evaluating or installing water treatment plants. The Department of Environment, in consultation with the Department of Municipal and Provincial Affairs, assesses water treatment needs of communities and makes recommendations for funding.

Proper operation and maintenance of water supply systems continue to be a challenge for smaller communities due to the difficulty of employing and retaining qualified and trained operators. The total cost incurred on annual operation and maintenance of water supply systems is also an issue due to the limited tax base of smaller communities. In order to overcome these issues, Government introduced a large scale operator education and training program with no cost to municipalities in 2001 and implemented the hands-on training phase of the program in 2002.

Figure 7: Boil Water Advisories



3 PROGRESS AND ACCOMPLISHMENTS

3.1 Source Protection

This province continues to have one of the most well established source protection programs in the country with approximately 70% of the total population of Newfoundland and Labrador receiving drinking water from protected surface and groundwater supplies. There are 262 active protected water supplies in the province. Even though the source protection program is very successful in that most of the major water supply areas have been designated as protected areas, the Department of Environment is continuing its efforts to designate remaining unprotected areas on a need and feasibility basis. Communities with unprotected surface water and groundwater supply areas were contacted about designation of their water supply as a protected area. In the 2002-03 fiscal year, 12 additional water supply areas were designated as protected water supply areas. In many cases, the requests were related to the expansion of existing protected areas. Three existing protected water supply areas were revoked because they were no longer being used.

A new watershed monitoring committee was appointed for Clarenville, thus there are eight active watershed monitoring committees in the province dealing with land management issues in the most sensitive water supply areas. Additional watershed monitoring committees will continue to be appointed, as the need arises.

In the 2001-02 annual report it was noted that in addition to source protection, the Department of Environment was working on a number of activities such as a water supply area atlas, digitization of water supply area boundaries, land use inventory, identification of high risk areas, development of watershed management plans, application of geographical information system (GIS) for land use analysis, and development of best management practices (BMPs), in order to ensure the safety of drinking water sources. The water supply area atlas has been updated. The protected water supply area boundaries have been digitized into a GIS water supplies area layer. The GIS water supplies area layer will allow consultants, municipalities and other stakeholders to better plan and manage activities within watersheds using GIS. The department continues to develop BMPs and is utilizing tools like the Canadian Water Quality Index (CWQI) to evaluate the effects of various BMPs. Identification of high risk areas is being done on a selective basis, and the department continues to work on the development of watershed management plans and a GIS based land use analysis and inventory.

3.2 Water Supply Systems

The aging infrastructure of water supply systems has been recognized as one of the greatest challenges faced while implementing the MBSAP for drinking water safety. The Department of Municipal and Provincial Affairs in 2002-03 approved $120,410,000 worth of projects in cost-shared funding under various water and sewer related infrastructure programs as listed in **Table 2**.

Over the past five years, the federal, provincial and municipal levels of government combined have invested over $296 million in the development, expansion and upgrading of water and sewer infrastructure. It is estimated that over 85% of the population is provided with public water services and over 70% with public sewer services.

Table 2: Funding Approved by the Department of Municipal and Provincial Affairs in the 2002-03 Fiscal Year

Type of Project	Number of Projects	Total Funding
Water and sewer servicing	280	$92.72M
Development of a new water source	19	3.02M
New installation of chlorination equipment	27	1.62M
Upgrading of existing chlorination equipment	89	5.24M
New Water treatment process	24	16.72M
Upgrade existing water treatment process	3	0.20M
Water and sewer studies	27	0.88M
Chlorination test kits	29	0.01K
Total	498	$120.41M

Disinfection of drinking water is recognized as an essential component of the MBSAP and thus, has been given priority throughout the past year. Since 2001, under the Disinfection Assistance Program, administered by the Department of Municipal and Provincial Affairs, municipalities received funds in the amount of $15.6 million. Another $20.3 million was approved for concurrent work under other capital works programs. As a part of this program, about 174 municipalities were provided with chlorine measurement kits at a total cost of $80,000.

The number of water treatment facilities across the province continues to grow gradually. The decision to implement a conventional or package water treatment facility is made based on a review of the available water quality data and the extent and nature of water quality problems. Most communities affected with arsenic have been provided funding to develop alternate water supply sources.

3.3 Water Quality Monitoring, Data Management and Reporting

The province continues to monitor the drinking water quality of all public water supplies and thereby remains one of only two provinces in Canada which has assumed this responsibility. This enables the province to adopt a proactive approach towards the safety of drinking water, in which emerging issues of concern are identified faster and responded to more efficiently than would have been possible had this responsibility been assigned to the municipal governments. The central coordination of sampling ensures that the same procedures are adhered to throughout the province. This also allows for improvements to the sampling and analysis program in a very cost effective manner.

Routine monitoring of drinking water quality in this province is a joint responsibility of the Department of Environment and the Department of Government Services and Lands. The Department of Environment is responsible for chemical and physical monitoring of source and tap water quality while the Department of Government Services and Lands through its network of 14 offices, is responsible for monitoring of bacteriological tap water quality and chlorine residuals. Larger municipalities such as St. John's and Corner Brook also collect bacteriological samples which are submitted to the province for analysis.

3.3.1 Chemical and Physical Water Quality Monitoring

Samples for physical and chemical analysis are taken from the source water (lake, pond, river, reservoir, well or spring) and from the distribution system. The distribution system samples, classified as tap water samples, are taken at a site significantly beyond the point at which treated water enters the distribution system. The delivery of the chemical drinking water quality monitoring program is carried out by five Watershed Management Specialists, one Groundwater Management Specialist and three Regional Water Quality Officers, along with their other duties and responsibilities.

Samples are collected semi-annually with the exception of THMs and haloacetic acids (HAAs) samples, which are collected on a quarterly basis. If there are any known or emerging site specific water quality issues, sampling frequency for inorganic parameters is changed from semi-annually to seasonal. The main emphasis of the sampling is on tap water quality. However, source water quality is also monitored on a selective basis in order to assess the impact of land use activities, effectiveness of buffer zones and other environmental controls, THMs pre-cursor levels, and comparison between source and tap water quality.

In the period of April 1, 2002 to March 31, 2003, a total of 2,566 source and tap water samples were collected for various types of chemical analysis. An overview of the sampling activities for the past fiscal year can be seen in **Table 3**.

The monitoring program is limited to public water supplies only as there is currently no requirement for the monitoring of institutional, commercial and private supplies.

To help ensure that consumers of water provided by a public drinking water supply have clean and safe drinking water, the province has adopted the chemical and physical guidelines in the *Guidelines for Canadian Drinking Water Quality 6th Edition, 1996* (GCDWQ), as revised, as provincial objectives. The provincial "Standards for Chemical and Physical Monitoring of Drinking Water" can be accessed at: www.gov.nl.ca/env/Env/waterres/Policies/WQ-Standard-PhysicalChemical.asp

The Department of Environment undertook a chemical sampling program during 2002-03 to determine the arsenic speciation of communities which have known concentrations of arsenic in their well water. The species of arsenic present can determine the most effective treatment method to remove the arsenic. Arsenic is found in both organic and inorganic forms. Inorganic arsenic is the most toxic and is the form primarily found in water. Fourteen communities were sampled on the Avalon Peninsula for the two common arsenic species. The results showed that arsenate(+5), the most easily removed species of inorganic arsenic, is the most abundant, while arsenite(+3), the more toxic form and harder to remove, is much less abundant.

Presently, the GCDWQ do not recommend a limit for HAAs. However, the province continues to test for HAAs in tap samples from surface water supplies in order to establish baseline data to be used as part of a national study for the development of HAAs guidelines. HAAs are not of concern with groundwater supply sources. Sixty-nine water supplies that serve 63 communities were sampled for HAAs in 2002-03. Monitoring efforts will continue to fill data gaps in this area.

Table 3: Overview of Sampling Activity* from April 1st, 2002 - March 31st, 2003

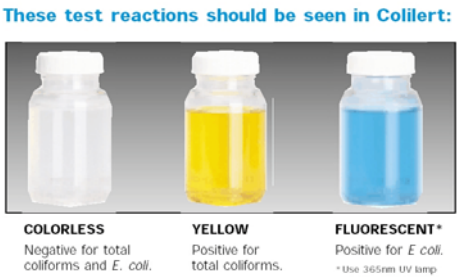
Parameter	Number of Source Samples		Number of Tap Samples	
	Surface	Ground	Surface	Ground
Inorganic Chemical Parameters	197	195	614	427
THMs	N/A: THMs are a result of chlorination, thus not found in source samples		911	89
HAAs	N/A: HAAs are a result of chlorination, thus not found in source samples		113	1
Organic Chemical Parameters	No source samples taken		19	0

* Additional samples taken for quality control purposes or taken from non-public water supplies are not included in this table.

3.3.2 Bacteriological Water Quality Monitoring

The provincial "Standards for Bacteriological Quality of Drinking Water" can be accessed at: www.gov.nl.ca/env/Env/waterres/Policies/WQ-Standards-Microbiological.asp

The bacteriological water quality monitoring program is carried out by 36 certified public health inspectors working in the Avalon, Eastern, Central, Western and Labrador regions from 15 Government Service Centre (GSC) locations. Seven of these positions were added during the 2002-03 fiscal year. The Public Health Laboratory and five affiliated regional testing sites provide water quality testing service across the province. The test methodology currently in use for the detection of total coliforms and *E. coli* is the ColiBlue test method. The ColiBlue method is a quantitative test method which simultaneously tests for the presence of both total coliforms and *E. coli*. A second method called Colilert is also available as a front line test for field testing by inspectors. This is a qualitative presence/absence test.



Sampling for bacteriological and chlorine residuals continued at an accelerated pace since April 1, 2002. The total number of public water supply samples tested during the reporting year was 15,352, which is approximately 30% more than in 2001-02. The results of the public water supplies tested are summarized in **Table 4**. 7.7% of samples tested were found to be unsatisfactory in terms of total coliforms and less than 1% were unsatisfactory in terms of *E. coli*.

In addition to the samples collected by GSC officials, several municipalities collect their own samples and submit them for analysis directly. The number of such samples submitted in 2002-03 was 4,931. These samples are not included in **Table 4**.

The presence of total coliforms in concentrations greater than the guidelines indicates that the treatment is inadequate or that the distribution system is experiencing regrowth or infiltration. They are not necessarily an indication of the presence of fecal contamination. The presence of *E. coli* is a definitive indicator of the presence of fecal contamination and must be dealt with as soon as reported.

The Public Health Laboratory and affiliated regional testing sites also process private well water samples for bacteriological testing. Bacteriological results are reported to the persons submitting the sample according to the standard protocol for bacteriological water quality monitoring and reporting. Unsatisfactory results are also notified to the GSC officials concerned. The results for private water supplies are summarized in **Table 5**.

Implementation of the MBSAP to provide safe drinking water is the main differentiating factor between public and private water supplies. One component of this approach is the use of continuous disinfection and the maintenance of a disinfection residual to ensure bacteriologically safe drinking water. Private water supplies typically do not have continuous disinfection. Instead, in order to achieve water of acceptable bacteriological quality, the construction of the well, its location and maintenance, along with the protection of the groundwater from contamination, are relied on to provide safe drinking water. When any of these components fail, water containing the indicator organisms, total coliforms and *E. coli*, and possibly pathogens, may be present in the private well water.

Table 4: Bacteriological Test Results from Public Water Supplies

	GSC Regions					Total
	Labrador	**West**	**Central**	**East**	**Avalon**	
Number of Samples	1,419	2,794	4,822	2,246	4,071	**15,352**
Total Coliforms Detected	190 (13.4%)	236 (8.4%)	337 (7.0%)	143 (6.4%)	276 (6.8%)	**1,182 (7.7%)**
E.coli Detected	24 (1.7%)	53 (1.9%)	50 (1.0%)	8 (0.36%)	15 (0.37%)	**150 (0.98%)**

Table 5: Bacteriological Test Results from Private Water Supplies

	GSC Regions				Total
	Labrador	**West**	**Central**	**East (Including Avalon)**	
Number of Samples	197	951	1,592	7,947	**10,687**
Number with 10 or more Total Coliforms Detected	34 (17.3%)	361 (38.0%)	457 (28.7%)	1,880 (23.7)	**2,732 (25.6%)**
Number with *E.coli* Detected	9 (4.6%)	110 (11.6)	147 (9.2%)	723 (9.1%)	**989 (9.3%)**

3.3.3 Data Management and Reporting

The data management and reporting system of the Department of Environment was completely revised and enhanced in 2001-02. This new system was successfully used to manage and report drinking water data collected in the 2002-03 fiscal year. All chemical analysis results for samples taken under the chemical monitoring program across the province were stored in one provincial database in the department. This database of source and tap water samples includes organic, inorganic, THMs and HAAs results.

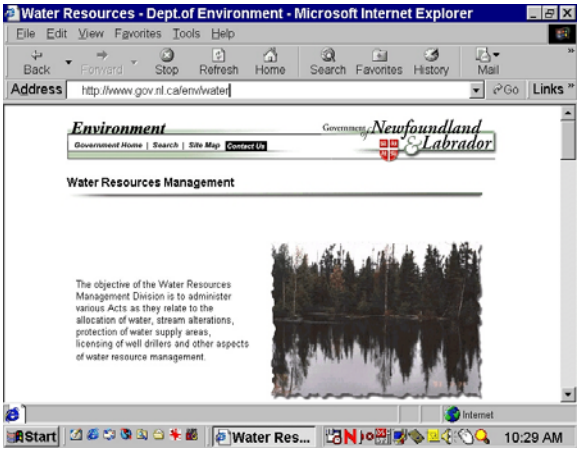
The early exceedance reporting system that was implemented in 2001-02 was also successfully used in the 2002-03 fiscal year. This system allows the department to inform a community of any problems in samples collected from the community as soon as it is detected at the analytical laboratory. This system was used to report 16 exceedances during spring 2002, 13 exceedances during summer 2002, 15 exceedances during fall 2002, and four exceedances during winter 2003 to the communities. The interpretive annual water quality report for each community sampled that was used for the first time in the 2001-02 fiscal year was successfully used again in 2002-03. The quarterly and annual reporting system was used to generate and mail out 310 quarterly reports during spring 2002, 322 quarterly reports during summer 2002, 378 quarterly and annual reports during fall 2002, and 297 quarterly reports during winter 2003 to the communities.

For internal management of drinking water quality data and to respond to public enquires in regional offices, a drinking water quality data search engine was developed, tested and implemented. This tool facilitates quick response to public enquires and will be further refined based on users input and future reporting needs.

To provide the public with greater access to drinking water quality data, the database is continuously being refined and improved to allow better reporting of water quality information on the internet. The web page posts the following information:

- historical drinking water quality data
- drinking water quality data for the past two sampling seasons
- proposed sampling to be conducted in fiscal year 2002-03
- boil water advisory information
- operator training and education schedule
- drinking water quality manual
- reports and publications

The web page can be visited at the following link: www.gov.nl.ca/Env/water



The public water supply database is continuously being updated to reflect changes and new information.

The use of the Canadian Water Quality Index to communicate drinking water quality results was evaluated and successfully implemented in a pilot project. After incorporation of user input, this will be implemented in the quarterly and annual reports of drinking water quality which are provided to the public.

A strategic plan on drinking water quality data management and communication is being developed. This is to improve the collection, management and communication of drinking water quality data to provide the public with timely and user friendly access to accurate data.

In order to facilitate the sharing of water supply and water quality information among government departments, the Municipal Information Management System (MIMS) was created. MIMS is a database, managed by the Department of Municipal and Provincial Affairs, which consists of several modules including basic information on all municipalities, waste management, capital works, financial details, municipal profiles and water supply information. This database provides essential information such as the area(s) serviced, the type of water supply, types of treatment, watershed or wellhead protection, boil water advisory status, bacteriological testing results, chemical testing results, and details on persons responsible for the system as well as their location. MIMS will be enhanced in several areas in the upcoming year. As of April 1, 2002 Environmental Health Officers have been using MIMS for entry of all bacteriological test results.

3.4 Regulatory Tools and Mitigation

3.4.1 Approvals

The issuance of regulatory approvals is an integral component of the MBSAP for drinking water safety. All public water supply and sewer systems in the province are regulated under the *Water Resources Act,* which was assented to on May 22, 2002. A total of 208 permits were issued throughout the past year dealing with various components of water supply and sewer systems.

In addition to the above regulatory permits, the Department of Environment also issued 130 permits under Sections 39 and 48 of the *Water Resources Act*. This regulatory approval process deals with development activities within public water supply areas and is designed to ensure the integrity of drinking water sources.

The *Water Resources Act* provides for the licensing of water well drillers in the province by setting minimum standards of training and experience in the construction of drilled wells. All non domestic wells also require a permit from the Department of Environment before construction begins. A well record is required to be submitted by each well drilling company for each well that it drills or deepens. A database of well records is maintained by the Department of Environment with up to 50 items of information concerning a well, including assessment of each well's water quality. There are about 15,000 records in the database with about 500 new wells being added each year. This information has been put on compact disk and is referred to frequently by consultants, municipalities, other government departments, pump installers, water bottlers, well drillers, and realtors. This information was updated in the past year.

3.4.2 Inspections

The Department of Environment requires that all public waterworks be maintained and operated in a manner that provides safe and clean drinking water for the benefit of present and future generations of Newfoundlanders and Labradorians. This is enforced through routine regulatory inspections of public water supplies. During the fiscal year 2002-03, 75 inspections were carried in connection with water and sewer related activities. Public groundwater wells and other selected wells were also inspected on a regular basis in order to ensure that these wells were constructed as per requirements of the *Water Resources Act*. Approximately 22 inspections were carried out on protected public water supplies to respond to public concerns in reference to development activities, as well to update land use inventory and identify the need for the preparation of watershed management plans.

3.4.3 Mitigation

The problems identified as a part of the drinking water quality monitoring and regulatory inspections are dealt with using a number of conventional and non-conventional mitigation strategies.

The Department of Environment is assisting several communities in reducing THMs levels. Chlorine demand modeling will be undertaken for select communities as and when needed to evaluate THMs control measures.

Contaminants with concentrations above the recommended guideline, such as arsenic, lead and turbidity need to be assessed on a case by case basis to determine the source and the extent of contamination. Once the source and extent have been determined, appropriate mitigative solutions are adopted. For groundwater sources, the Canadian Water Quality Index is being developed to be used as a screening tool for contaminants and surface water intrusion.

As a part of mitigative measures, alternative sources of water have been provided to communities affected by high levels of arsenic. This was found to be the most cost effective and sustainable solution.

3.5 Mapping of Arsenic Concentrations

In 2001-02 the Department of Environment, in conjunction with the Department of Mines and Energy, began exploring ways to determine the extent of background arsenic in groundwater in the province. Under a Memorandum of Agreement between the two departments, an arsenic risk map of the island portion of the province was prepared by using information obtained from public and private well sampling, and the results of previous geochemical lake sediment sampling. The map deals with the island portion of the province only since no arsenic exceedances have been found to date in Labrador.

The arsenic risk map in **Figure 8** shows the location of public wells and school wells containing arsenic and the areas of the province where elevated arsenic concentrations have been found in lake sediment sampling. This map is posted on the department's internet site. Government recommends that all well owners chemically test their well water. The map will serve as a reference and guidance document for the development of new wells in the province.

3.6 Operator Education and Training

The availability of qualified and trained operating personnel for water systems is vitally important for safe and sustainable operation of water supply systems. To this end the Department of Environment is committed to delivering a comprehensive operator education and training program. New staff members and their assignment into the regions have significantly increased the department's ability to deliver operator education and training, and provide a presence throughout the province.

The department's focus continues to be on operator competency in the operation and maintenance of the province's water supply systems. Initial focus has been on chlorination and disinfection equipment and practices, which will broaden to include the water distribution system, and water treatment facilities. The classroom style operator education seminars are intended to provide operators and municipal officials with the knowledge needed to operate and maintain their water systems so as to provide safe clean drinking water at reasonable costs.

As presented in **Table 6**, during 2002-03, the operator education program saw the delivery of 74 one-day classroom seminars, covering four separate topics, in 19 locations throughout Newfoundland and Labrador. Total attendance at these seminars was 713 persons, representing municipal systems, non municipal systems such as school boards, industry, parks and campgrounds, and government departments responsible for water systems.

These educational seminars are made available free of charge to the municipality, group, or individuals attending. The only cost to participants is their travel costs, and as every effort is made to hold the seminars at convenient locations throughout the province, overnight travel is generally not required, except for communities on Coastal Labrador where participants must travel to Happy Valley - Goose Bay. The Department of Municipal and Provincial Affairs provided financial assistance to municipalities to help cover the cost of travel and meals for municipal employees attending the seminars.

Figure 8

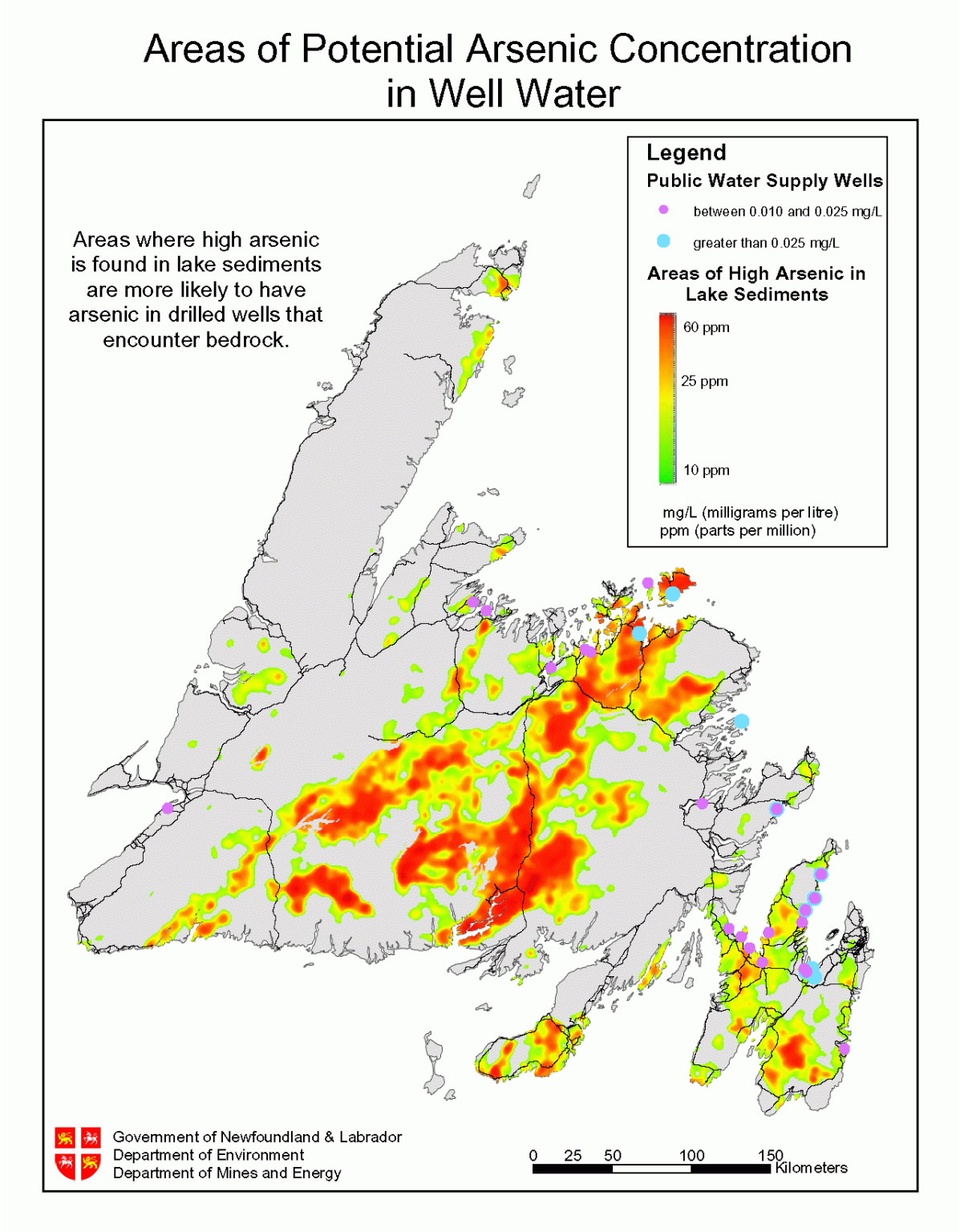

Areas of Potential Arsenic Concentration in Well Water
Areas where high arsenic is found in lake sediments are more likely to have arsenic in drilled wells that encounter bedrock.
Legend
Public Water Supply Wells
between 0.010 and 0.025 mg/L
greater than 0.025 mg/L
Areas of High Arsenic in Lake Sediments
60 ppm
25 ppm
10 ppm
mg/L (milligrams per litre)
ppm (parts per million)
Government of Newfoundland & Labrador
Department of Environment
Department of Mines and Energy
0 25 50 100 150
Kilometers

Table 6 - Operator Education and Training Activities during 2002-03

Presentations	Total Attendance	Number of Municipalities	Number of Non Municipal	Government Departments
74	713	259	23	3

The four education seminars offered in 2002-03 included:

- System Operation and Maintenance Part I;
- System Operation and Maintenance Part II;
- Water Distribution System Flushing and Chlorine Residual Measurement;
- Operation and Maintenance of Very Small Water Systems.

Because of the ongoing concern for the number of boil water advisories and non-operational chlorination systems, each session spent some time on the need for chlorination, and on operation and maintenance of chlorination equipment.

Hands-on training, which is phase two of the education and training program, was implemented in 2002-03 with the addition of three operator trainers in November. In February 2003, three mobile training units were made available to the program. These units are 4.8 metre long cube vans equipped with a work area, and training equipment to provide operators an opportunity to better understand and maintain their equipment, and to demonstrate other available tools. To date, the mobile training units have visited 100 systems and 110 chlorination facilities have been inspected. Equipment that will be available as training aids will include hypochlorinator pumps; hydrants; valves; backflow prevention devices; pipe location equipment; leak detection equipment and other such equipment.

There has been a steady increase in the number of certification exams undertaken by water distribution system operators in this province. In 2000 there were 10 operator certificates issued including both water and wastewater operations. This increased to 36 operator certificates in 2001, with an increase to 94 operator certificates in 2002. Of these 94 certificates, 83 were related to water distribution (64 Water Distribution I Certificates, 18 Water Distribution II Certificates, one Water Distribution III Certificate). It should be noted, 49 of these certificates were issued to operators who had no previous certification. Some operators are also certified as Water Treatment Operators, or Wastewater Treatment Operators. This increase is partly due to the recognition of the need for certification, and partly due to the fact that the Department of Municipal and Provincial Affairs has subsidized the cost of certification courses over the past two years.

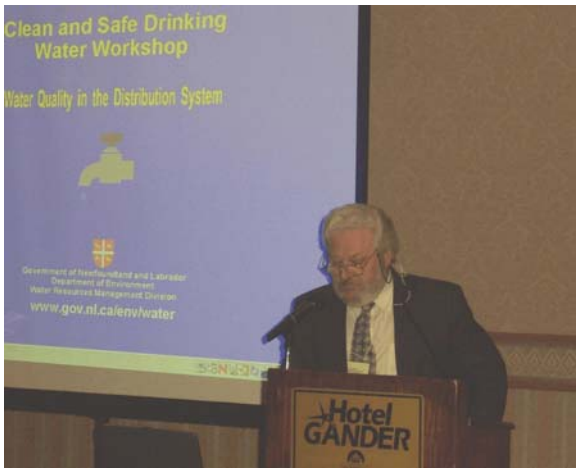
The Atlantic Canada Water Works Association offered three water distribution courses in the province in 2002 - one in Grand Falls-Windsor, one in Happy Valley-Goose Bay and one in St. John's. These were all four-day courses, and the average cost per operator ranged from $1500 to $2500 depending on location. This cost significantly limits the number of operators who can attend. Therefore, the education seminars offered by this department beginning 2003-04 will provide an opportunity for operators in all parts of the province to participate, without the need to travel long distances and spend several days away from their systems.

Although there has been a fair amount of effort made to certify operators to date, the fact that there are only 73 municipalities with certified operators, and there are only 130 certified operators, many of whom hold certificates in more than one class, it is apparent there is much to be done in this regard.

In addition to the preparation of the presentation and handout material for the 74 presentations made during the year, the following documents were prepared:

- Curriculum for Water Distribution Training Levels I & II
- Curriculum for Water Treatment Level I
- Operator Education Schedules
- Web Page Information for OETC Section
- Discussion Paper on Operator Certification in Newfoundland and Labrador
- Report on Gander Workshop 2002
- Brochures for the Gander Workshop, Operator Education, Training, and Certification Section
- Handout for operators on Primary and Secondary Disinfectants.

The Department of Environment also hosted its third annual "Clean and Safe Drinking Water Workshop". The workshop was held in Gander from March 25th to 27th, 2002. The title of the workshop was "Clean and Safe Drinking Water - Water Quality in the Distribution System". Participation was excellent with 293 registrants. The Department of Municipal and Provincial Affairs provided financial assistance to communities wishing to attend the workshop. This assistance was in the form of a maximum $300 grant per community to assist with travel costs. The workshop also included a trade show of suppliers and consultants demonstrating their products and educating people on product functions and operation.



3.7 Inter-Departmental Cooperation

As stated in Section 1, the Safe Drinking Water - Technical Working Group (SDW TWG) consists of representatives from the four key government departments responsible for providing clean and safe drinking water through the implementation of the multi-barrier action plan. The SDW TWG is represented by the following line departments:

- Environment (ENV)
- Government Services and Lands (GSL)
- Health and Community Services (HCS) including representation from the Regional Medical Officer of Health and the Public Health Laboratory
- Municipal and Provincial Affairs (MPA).

The Safe Drinking Water - Technical Working Group meets as frequently as every 2-4 weeks and reports activities regularly to the steering committee of senior government officials. This working group ensures that the participating departments are always appraised of current events pertaining to drinking water. It allows appropriate efforts to be directed at emerging issues with the best available resources without duplication. With this working group, there is an effective networking mechanism in place.

Some of the major accomplishments of the SDW TWG in 2002-03 include:

- Input and review of *Safe Drinking Water Report* and preparation of a public information brochure which was distributed province-wide in September 2002.
- Revision of Standards for Bacteriological Quality of Drinking Water to include private water sources. These were implemented by June 1, 2002.
- Coordination of provincial budgetary submissions for the next year for initiatives under the Safe Drinking Water program.
- Responses to recent findings of exceedances of contaminants.
- Evaluation of bacteriological sampling regimes and evaluation of current boil water advisories.
- Liaising on the development of chlorine meter calibration test kits.
- Verification of water supply information as reported to the Municipal Information Management System (MIMS) database.

This co-ordinated approach by Government has ensured substantial progress in implementing the MBSAP for drinking water safety.

3.8 Resources and Benefits

During the 2002-03 fiscal year, $1.5 million was spent for drinking water initiatives by various government departments implementing the MBSAP. In addition $55.8 million was expended in capital works programs which provided for new drinking water infrastructure, such as water treatment and distribution systems.

The Department of Environment spent $530,000 to implement phase two of its community based operator education and training program and to support the drinking water quality monitoring program. Three mobile training vans were purchased, developed and deployed for hands-on training of municipal operators.

In addition to capital infrastructure funding, the Department of Municipal and Provincial Affairs also hired three Community Water and Wastewater Specialists for the inspection and repair of disinfection systems and to develop a database which will assist the four departments in their efforts to share information on municipal water supplies.

The Department of Municipal and Provincial Affairs provided financial assistance to communities attending the training, workshop and certification courses relating to drinking water safety.

The Department of Government Services and Lands spent $458,000 in 2002-03 to hire seven new environmental health officers (EHOs). These officers are involved in the department's bacteriological sampling of public water systems and are deployed throughout the province.

The Department of Health and Community Services spent nearly $500,000 in 2002-03 for three initiatives. These funds were used to increase the capacity of the Newfoundland Public Health Laboratory to carry out bacteriological water quality testing, to hire an environmental health specialist to lead a health promotion strategy related to drinking water quality issues, and to provide funding to the Health Labrador Corporation and Grenfell Regional Health Services to hire a shared environmental health coordinator to work with the medical officers of health for the two integrated health boards.

These additional resources have made substantial improvements in the management of public water supplies in Newfoundland and Labrador. In 1989, this province had no chemical drinking water quality monitoring. In 2001, this province adopted the MBSAP, accomplished a complete monitoring of all public water supplies, and phase one (classroom training) of the operator education and training program was launched. In 2002, technical tools for data management and reporting and source protection were developed and implemented and phase two (hands-on training) of the operator education and training program was launched.

4 PATH FORWARD

4.1 Government's Commitment to Clean, Safe and Secure Drinking Water

The Department of Environment, along with the Departments of Health and Community Services, Municipal and Provincial Affairs and Government Services and Lands is committed to implement the MBSAP for drinking water safety and to ensure public confidence in our water supplies.

4.2 Action Plan for 2003-04

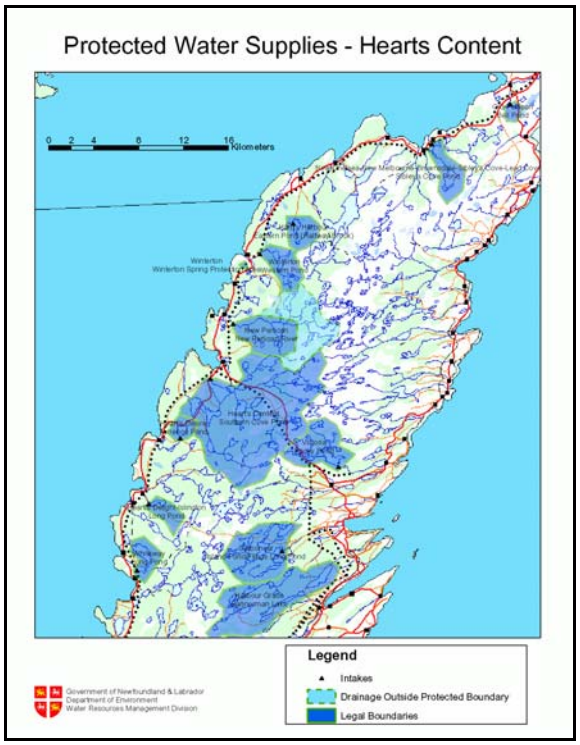
4.2.1 Department of Environment

In 2003-04 the Department of Environment will continue to strengthen and expand all those elements of the MBSAP in which it is involved, especially source protection, regulation of water and sewer infrastructure, water quality monitoring and reporting, and its community based operator education and training program.

Source protection is one of the key elements of the multi-barrier action plan and the first step to ensure drinking water safety. In order to strengthen its source protection program, in 2003-04 the GIS water supplies area layer will be made available to government, industry and the private sector. The Department of Environment will also add unprotected and potential water supply areas to the GIS water supplies area layer. Water supply areas that are going through the Interdepartmental Land Use Committee process to be designated for protection will also be added to the GIS. It will complement the land use inventory, watershed management and wellhead protection activities.

The water supply atlas and public water supplies list will be updated regularly. The drinking water quality database and the drinking water quality information on the web-page will be updated every quarter.

The drinking water quality component of the departmental GIS will be completed, tested and deployed internally. This will improve the department's ability to better respond to public enquires on drinking water quality and to better share information with the regional offices. It will also facilitate watershed analysis, development of watershed management plans and hydrological analysis. Once the GIS has been deployed successfully internally, the second phase of the GIS development project will provide public access to the GIS using the internet.



The drinking water quality search engine will be refined on a need basis and the Canadian Water Quality Index will be implemented in the quarterly and annual drinking water quality reporting system.

Over 3,000 drinking water samples will be collected for chemical water quality analysis. In addition, samples will also be collected for quality control analysis and repeat sampling will be carried out on site specific exceedances. The entire cost of the chemical analysis will be assumed by the Department of Environment. The department will continue to improve public access to drinking water quality data.

The drinking water quality database will be transferred to a better Oracle based database management system. The database will also be implemented into a GIS, and new data reporting tools will be developed to further improve the management, analysis, utility and reporting of the drinking water quality and boil water advisory data being collected.

The new application/inspection tracking system is under final testing. This will streamline the tracking of applications and approvals issued under various Sections of the *Water Resources Act*. The system will be web based and accessible by regional staff. The goal of the system is to decrease the time spent tracking information and preparing approvals to allow more time for field work.

Government realizes qualified and trained operating personnel for water systems are vitally important to the safe and sustainable operation of water supply systems and is committed to continuing to make low cost training available to municipalities. Commencing in May 2003 the department will begin the delivery of Water Distribution Level I & II training. This program will be delivered in six or seven modules over the next two years, providing the theory and knowledge needed by operators to operate their system, and for those qualified operators who chose to do so, write certification exams. The department will continue to encourage and facilitate operator certification.

It is recognized that many councillors and municipal administrators are unable to attend the day- long training sessions, as most have day jobs. In an effort to provide some basic knowledge of water systems, chlorination systems and various regulations concerning these systems, a number of evening sessions will be held in the same locations as the operator education seminars in the spring of 2003.

The drinking water workshop will be held on an annual basis. The topic for the 2004 workshop is “Clean and Safe Drinking Water Workshop - Water Treatment and Operation and Maintenance of Small Systems”.

The Department of Environment will continue to maintain boil water advisory information on its web page, based on the information provided by the Government Service Centres. This information will also be displayed in the departmental GIS.

Based on the drinking water quality monitoring and regulatory inspections, site specific contamination issues will continue to be identified and mitigation plans will be developed to address these issues. Water treatment needs will be assessed for affected communities. As has been experienced to date, it is expected that priority concerns will be:

- Aesthetic parameters - pH, colour and others
- Contaminants - turbidity, arsenic and lead
- THMs
- Bacteriological Parameters

Similar to the arsenic mapping, contaminant mapping will be developed for other contaminants.

The Department of Environment and Department of Mines and Energy will conduct further work on concentrations of arsenic in bedrock and its relationship to well water. Investigations of fluoride and uranium in well water will also be undertaken and will involve further testing of wells at selected locations.

Funds have been allocated in the 2003-04 fiscal year for organic testing of 20 selected public groundwater supplies. Well selection will be based on an assessed risk of potential sources of contamination adjacent to the wellheads. Parameters to be tested may include pesticides, and hydrocarbons including MTBE (methyl tertiary-butyl ether).

4.2.2 Department of Municipal and Provincial Affairs

The Department of Municipal and Provincial Affairs will continue to provide funding for new infrastructure. The department is also encouraging regionalization of water supply systems where smaller communities in the region will be serviced by bigger communities. The department is also offering incentives to regionalize operation and maintenance services or personnel. This year, phase one of a $6.5 million project to extend the Exploits Regional Water System, currently servicing Bishop's Falls and Grand Falls - Windsor, to include Botwood and Peterview was initiated.

The Municipal Information Management System (MIMS) will be enhanced in several areas in the coming year. This will include internet based applications for easier public and remote office access.

The department will continue to provide financial assistance to communities wishing to attend the training, workshop and certification courses relating to drinking water safety.

4.2.3 Department of Health and Community Services

The Department of Health and Community Services expects to fund the following initiatives in 2003-04: $5,000 will be allocated to phase one of an effort to expand the department's water quality testing range to include certain parasitic pathogens that may pose health concerns. An additional $15,000 will be spent towards the future accreditation of the water and environmental testing lab of the Public Health Laboratories. Health promotion efforts related to drinking water issues will be enhanced, including the development of new information pamphlets and presentation resources, the delivery of a safe drinking water promotional tour, and the participation of staff in community events by hosting information displays about healthy drinking water.

4.2.4 Department of Government Services and Lands

The Department of Government Services and Lands has now filled all but one of its 36 budgeted environmental health officer positions. Efforts are currently underway to recruit and fill the lone vacant position. With a full compliment of staff, the department will strive to meet the drinking water sampling frequency as recommended in the "*Guidelines for Canadian Drinking Water Quality*"

4.3 Working Together

The Safe Drinking Water - Technical Working Group, comprised of representatives from the four government departments, will continue to work under the guidance of the Deputy Minister's committee. The main functions of the committee are:

- To recommend appropriate actions for government departments to undertake to protect drinking water safety and to advise government on emerging issues.
- To monitor actions taken by government departments, municipalities and Health and Community Services Boards to protect drinking water supply.
- To carry out ongoing reviews of existing policies, practices, procedures and standards for safe drinking water.
- To identify areas of improvement with respect to policies, legislation, utilization of human resources, infrastructure, education and public awareness and water related research opportunities.
- To ensure there is an open and thorough inter-departmental exchange of information about all current programs and activities pertaining to safe drinking water, including water sampling and testing, watershed protection, training, capital works improvements, public education and public advisories.

5 CONCLUSIONS

Government is committed to ensure drinking water safety and restore public confidence in public water supply systems. In May 2001, government approved the implementation of the MBSAP for drinking water safety. This plan is based on the multi-barrier framework and is being implemented jointly by four government departments under the direction of the cabinet committee supported by a technical working group.

Substantial progress has been made on all elements of the MBSAP in order to provide clean, safe and secure drinking water to the people of this province. This includes the designation of 12 new protected water supply areas, investment of over $178.6 million on various water and sewer projects since 2001, improved reporting of drinking water quality data and boil water advisories, reduction in number of boil water advisories, resolution of trihalomethanes and other drinking water quality issues (pH, colour, turbidity, arsenic, fluoride and lead) in a number of communities, improvements in regulatory approval and inspection systems, and delivery of operator education and training. Funding for water treatment plants was provided to communities affected by arsenic. Arsenic mapping has been completed and made available to the public.

All protected water supply areas have been digitized into GIS format and will soon be made available to the public and stakeholders. This will facilitate natural resource development activities within public water supply areas. The regulatory permitting process has been revised to introduce two categories of permits; Permits to Construct and Permits to Operate. Permits to Operate will deal with the operational aspects of water supply systems and its implementation will enhance drinking water safety. A drinking water quality search engine has been developed to facilitate quick response to public enquires about drinking water quality. A communications tool, the Canadian Water Quality Index, is being implemented into the quarterly and annual reporting system to simplify the interpretation and communication of drinking water quality data.

This report has also identified many challenges and issues surrounding the provision of safe, clean and secure drinking water to the public in Newfoundland and Labrador. The government departments, each with their own role to perform, and, in cooperation with municipalities, will continue to respond and to address these challenges. The substantial improvements in relation to drinking water issues made in 2002-03 will be followed up with further initiatives under the multi-barrier strategic action plan.

GOVERNMENT OF
NEWFOUNDLAND AND LABRADOR

Department of Environment