Public Drinking Water in Maine

A Report from the Maine CDC Drinking Water Program

Maine Center for Disease Control and Prevention
An Office of the Department of Health and Human Services
Paul R. LePage, Governor
Mary C. Mayhew, Commissioner

Annual Report

2015

INTRODUCTION

Dear Reader:

I am pleased to introduce the 2015 annual report of "Public Drinking Water in Maine." This report is intended to provide the reader with an overview of public water system compliance, quality of public drinking water and the efforts of the State of Maine Drinking Water Program in ensuring safe drinking water. This report highlights compliance rates for the past 10 years.

For many in the drinking water community, the end of 2015 and the beginning of 2016 will be remembered for the lead contamination crisis in Flint, Michigan. This public health tragedy should be a reminder of the great benefits that we enjoy daily from safe drinking water and the adverse consequences that can occur if we are not vigilant in the protection of public health.

Safe and reliable supplies of drinking water are essential for public health protection as well as the economic viability of communities. Maine is fortunate to have an abundance of clean water available for public water systems to collect, treat, store and distribute.

The Drinking Water Program, which is part of the Maine Center for Disease Control and Prevention, within the Department of Health and Human Services, is responsible for ensuring that public water systems comply with federal and state regulations on drinking water. The Department of Health and Human Services has been providing public health protection through drinking water regulations since the early 1900s when typhoid and cholera outbreaks were common due to the consumption of contaminated drinking water. In 1976, the Drinking Water Program began administering the federal Safe Drinking Water Act.

Since 1976, public water systems continue to comply with an increasing number of rules and regulations related to safe drinking water. When public water systems comply with these regulations, the water they serve is determined to be "safe."

I express my appreciation to the men and women across Maine who work diligently to ensure that high quality, affordable public drinking water is supplied to consumers in Maine. I hope you find this report informative and helpful.

Yours for safe drinking water,

Roger L. Crouse, P.E. Director,
Maine CDC Drinking Water Program

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ABOUT THE DRINKING WATER PROGRAM: WHO WE ARE AND WHAT WE DO

PRIMACY

The Maine Drinking Water Program administers the federal Safe Drinking Water Act through the National Primary Drinking Water Regulations. Maine was granted primacy by the United States Environmental Protection Agency.

MAINE LEGISLATIVE AUTHORIZATION

In order for Maine to hold the authority to administer both state and federal safe drinking water regulations, the Maine State Legislature enacted Maine's Water for Human Consumption Act. This law grants the Drinking Water Program oversight of all operational aspects of public water systems in Maine, which affect their serving of drinking water and impacts public health.

MISSION STATEMENT

The Drinking Water Program works to ensure safe drinking water in Maine, to protect public health, by administering and enforcing drinking water and subsurface wastewater regulations, providing education and technical and financial assistance.

ORGANIZATION

The Drinking Water Program is organized into three teams: Engineering and Water Resources, Data Management and Program Support, and Public Water System Inspection. Each team plays a crucial role in ensuring that Maine's public water systems are providing safe, reliable drinking water to their customers.

THE ROLE OF DRINKING WATER IN PUBLIC HEALTH PROTECTION

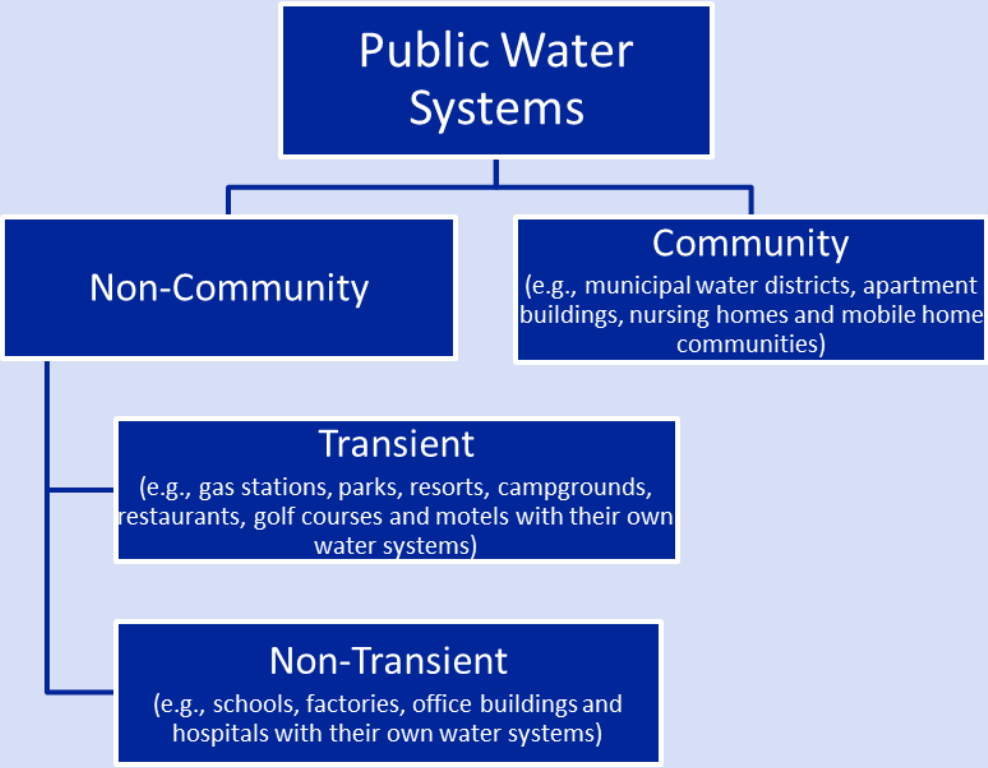
The United States is one of the places with the safest drinking water supplies in the world. Over 286 million Americans get their tap water from a community water system. The United States Environmental Protection Agency regulates drinking water quality in public water systems and sets maximum concentration levels for water chemicals and pollutants.

Sources of drinking water may be subject to contamination and, therefore, require appropriate treatment to remove disease-causing contaminants. Contamination of drinking water supplies can occur in the source water and the distribution system, after water treatment was installed. There are many causes of water contamination, including naturally occurring chemicals and minerals (for example, arsenic, radon, uranium), local land use practices (fertilizers, pesticides, concentrated feeding operations), manufacturing processes and sewer overflows or wastewater releases. The presence of contaminants in water can lead to adverse health effects, including gastrointestinal illness, reproductive problems and neurological disorders. Infants, young children, pregnant women, the elderly and people with compromised immune systems may be especially susceptible to illness from some contaminants.

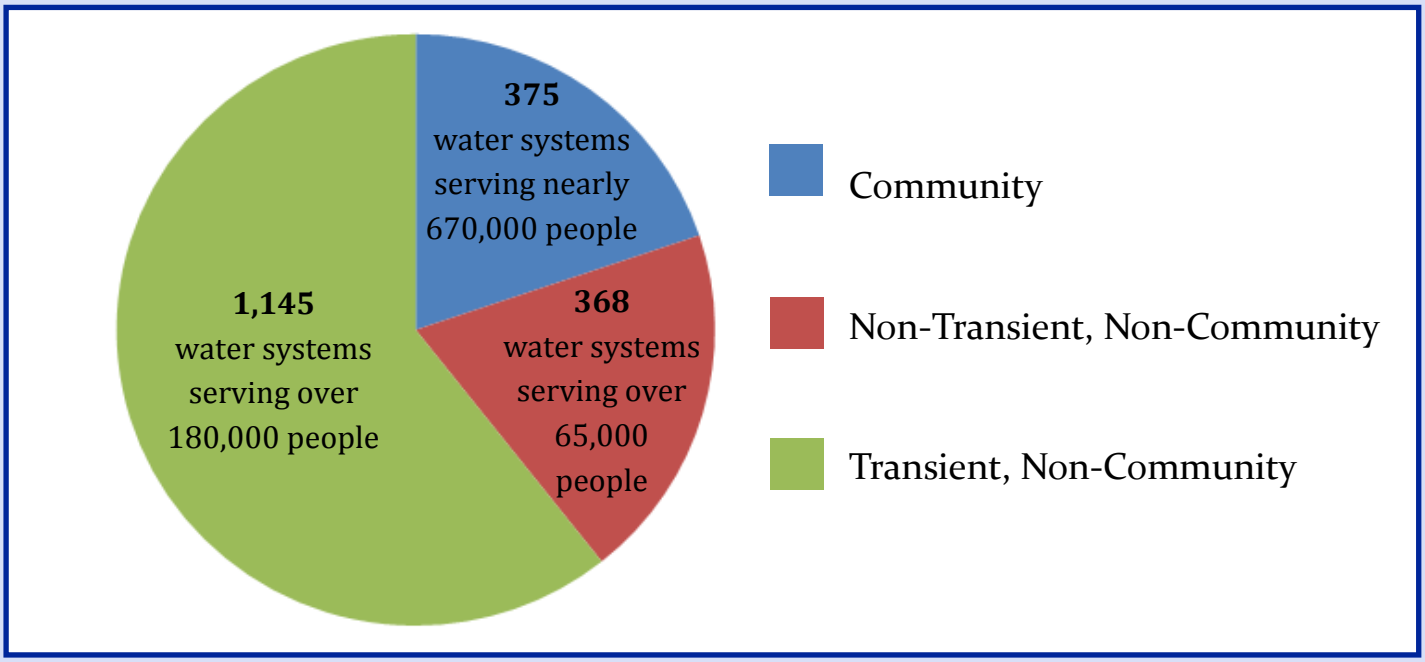
PUBLIC WATER SYSTEMS IN MAINE

WHAT IS A PUBLIC WATER SYSTEM?

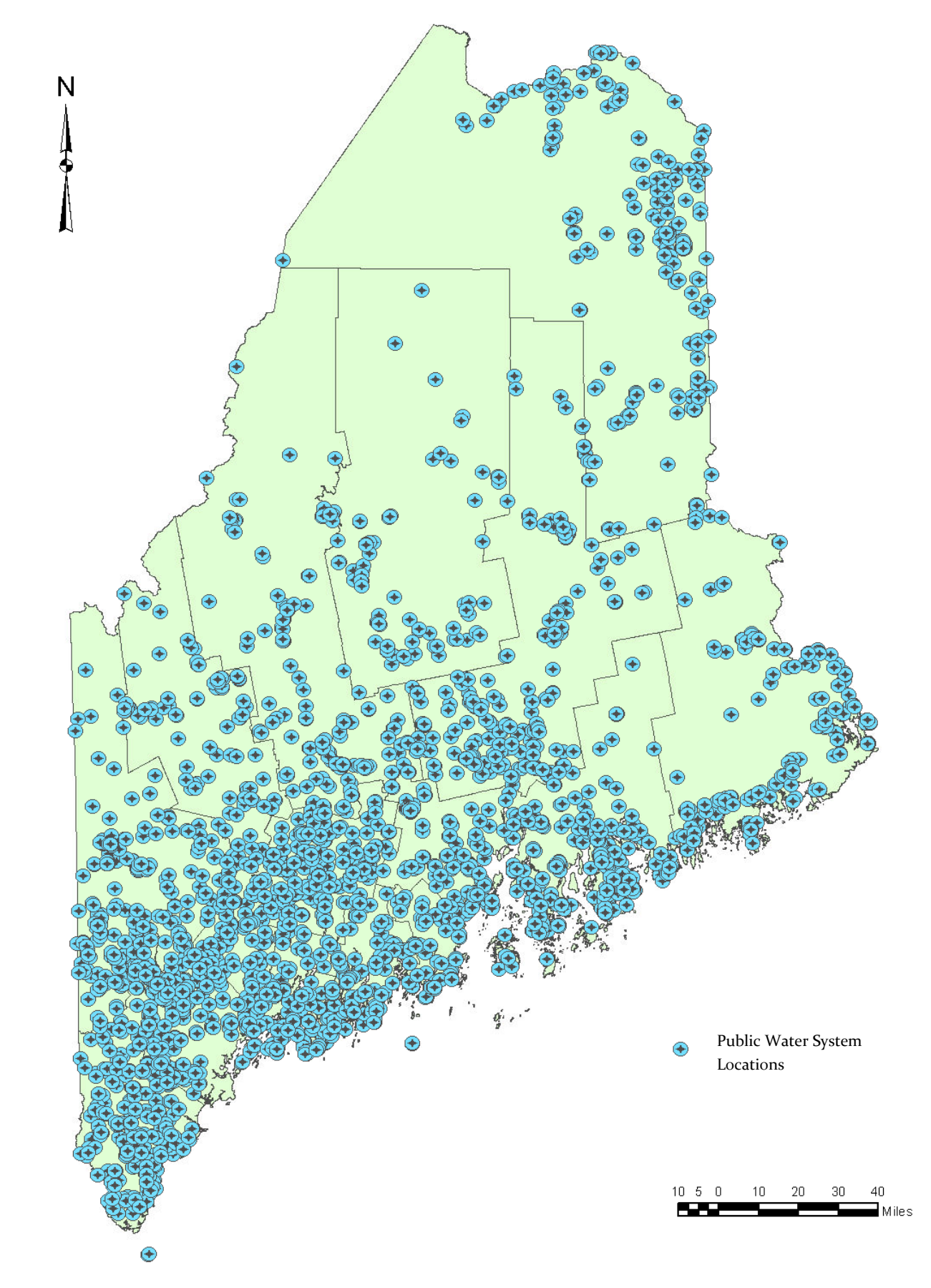
Public water systems provide water for human consumption through pipes or other constructed conveyances to at least 15 service connections, or serve an average of at least 25 people, for at least 60 days a year. There are three types of public water systems: community, non-transient non-community and transient.



Public Water Systems in Maine by Type



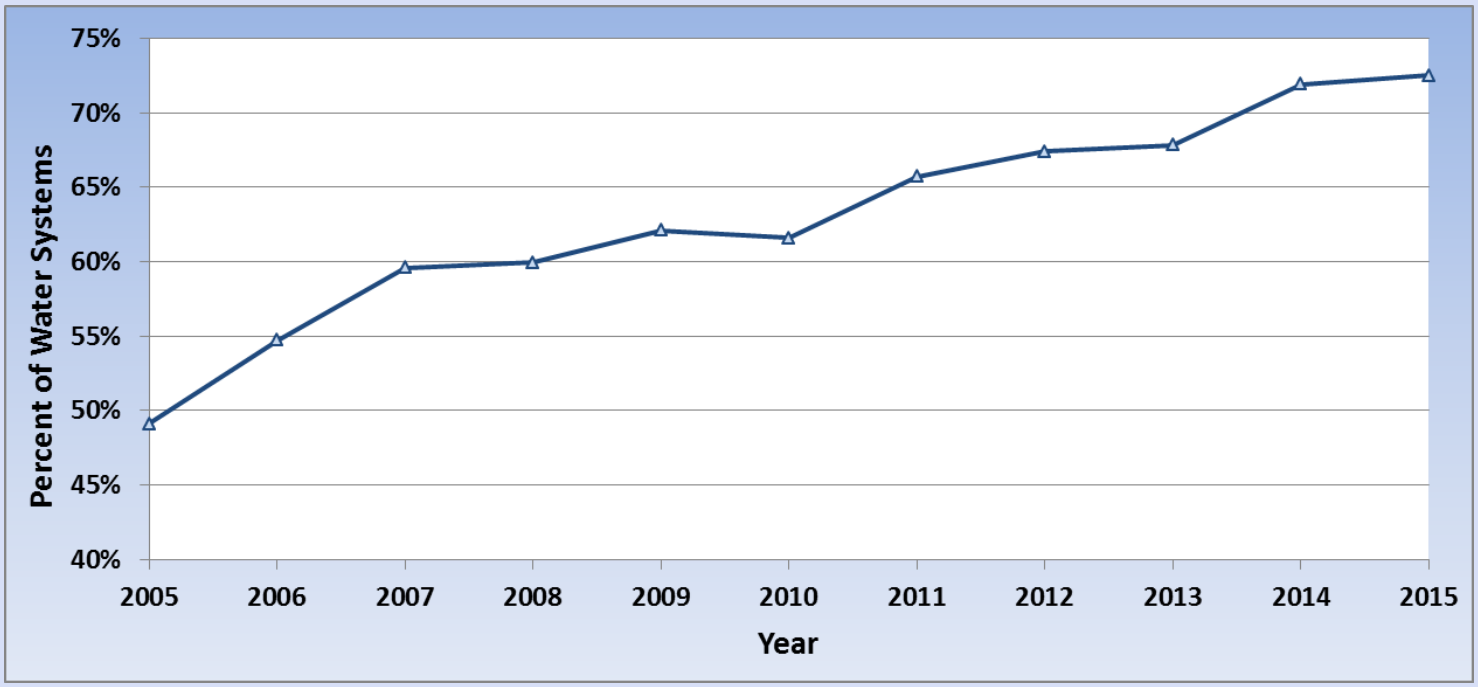
MAP OF PUBLIC WATER SYSTEMS THROUGHOUT MAINE



MEASURES

Total Number of Violations Incurred by Year: 2005-2015

Public Water Systems Without a Violation: 2005-2015



MEASURES

SOURCE PROTECTION MEASURES

Surface Water Treatment Rule Filtration Avoidance

The Surface Water Treatment Rule contains provisions that require disinfection and filtration for all public water systems that use surface water or a source that is groundwater under the direct influence of surface water.

Only those systems able to demonstrate compliance with the Rule's stringent water quality criteria qualify for an avoidance to filtration. Maine has nine community water systems that qualify for, and currently maintain, filtration avoidance. The following public water systems currently qualify for a filtration avoidance:

Mount Desert Water District- Seal Harbor — Jordan Pond

Portland Water District — Sebago Lake

Mount Desert Water District- North — Lower Hadlock Pond

Lewiston Water and Sewer Division — Lake Auburn

Great Salt Bay Sanitary District — Little Pond

Brewer Water Department — Hatcase Pond

Town of Bar Harbor Water Division — Eagle Lake

Bangor Water District — Floods Pond

Auburn Water District — Lake Auburn

Synthetic Organic Compound Waivers

In 2015, **203** water systems were issued waivers, including **116** community and **87** non-transient, non-community water systems, for semi-volatile herbicides and pesticides, for a savings of over **$100,000**.

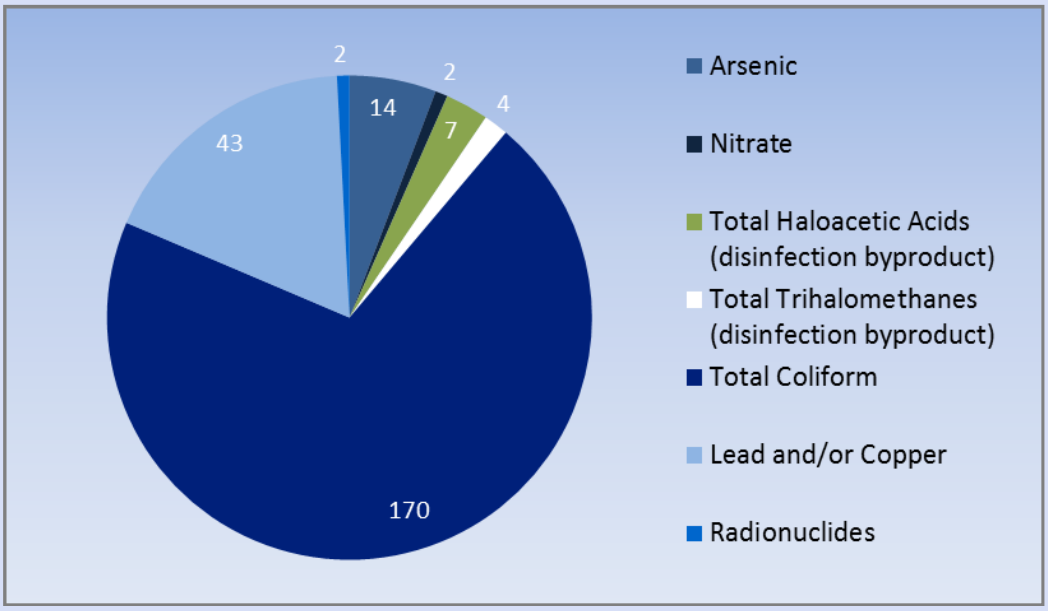
The Drinking Water Program may waive testing for synthetic organic compounds if regulated chemicals were not used in the area. Any public water system that seeks a waiver from synthetic organic compound sampling must have an approved wellhead or watershed protection plan and be able to demonstrate that land use within 2,500 feet of each source does not pose a threat from contamination by synthetic organic compounds, such as herbicides, pesticides, and other semi-volatile compounds. Systems with these waivers may save as much as $1,000 per well. All community and non-transient, non-community water systems are provided synthetic organic compound waiver applications on a three-year rotation.

MEASURES

SAMPLING MEASURES

Health-Based Violations Issued in 2015 for Regulated Contaminants

Violations issued when a sample result from a public water system exceeds a drinking water standard for a regulated contaminant.

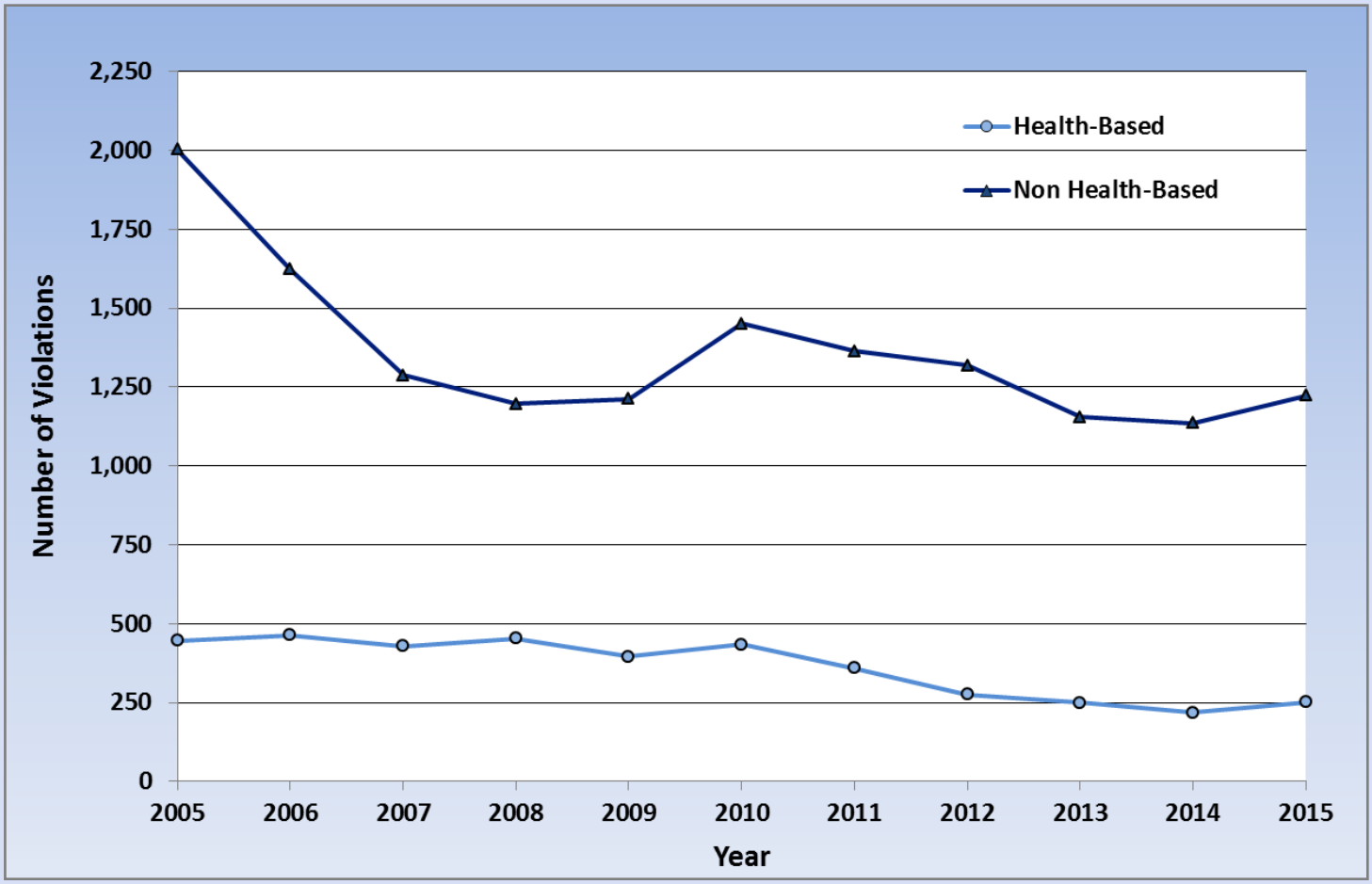


Violations Issued For Failure to Monitor or Report: 2005-2015

When a public water system misses a sample or does not report a sample result on time, the Drinking Water Program notifies the public water system that it violated the rule.

MEASURES

Total Violations Issued to Public Water Systems: 2005-2015

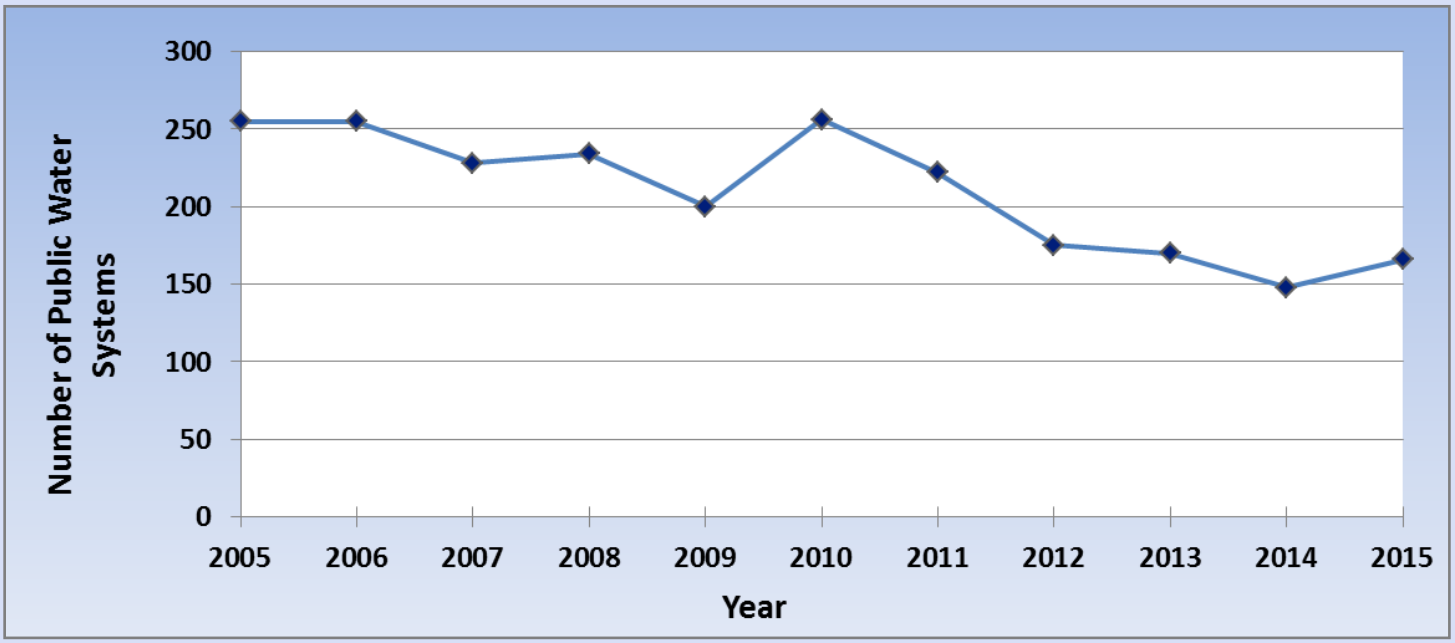


Health-Based and Non Health-Based Violations

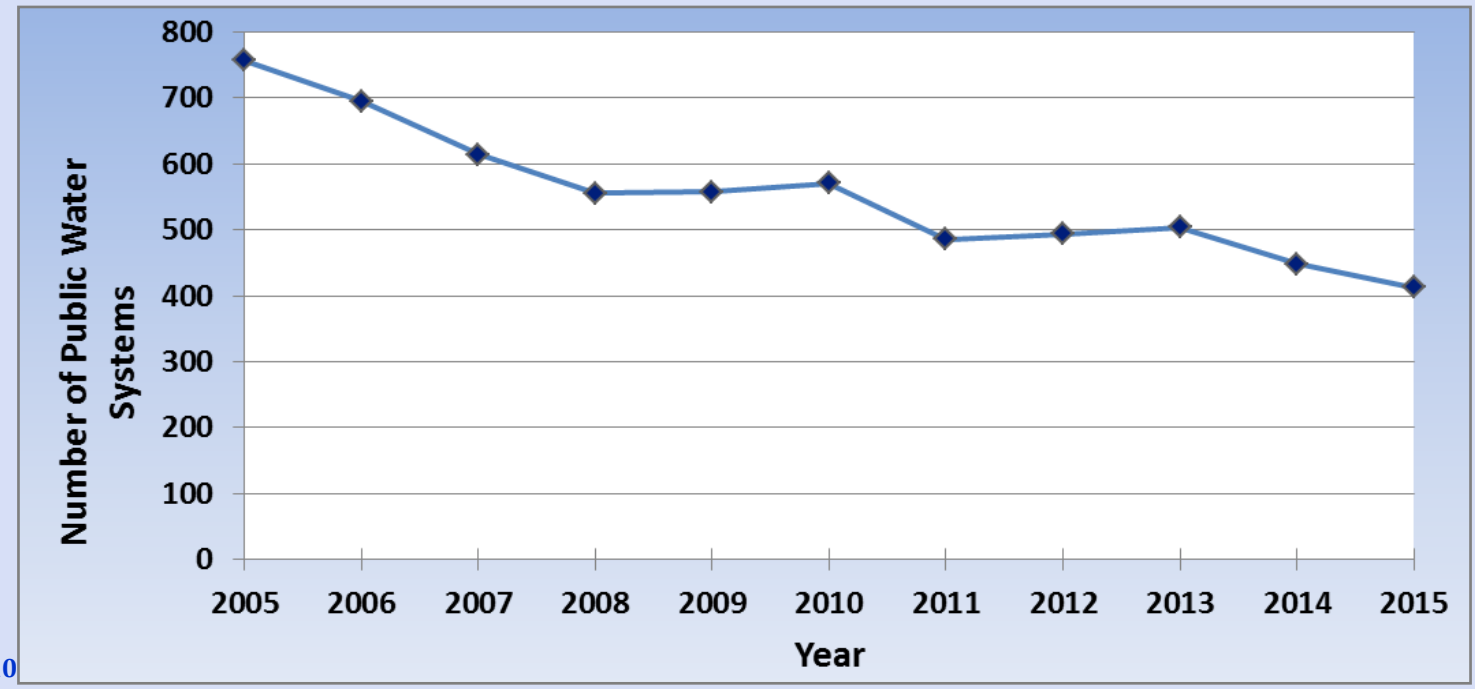
If a public water system reports contaminants within their water above a maximum contaminant level, then it may result in a "health-based violation." If a public water system fails to collect a sample when required, or fails to report the accurate type and amount of test results when required by the Drinking Water Program, then the violation is generally considered a "non health-based" violation.

MEASURES

Public Water Systems: Health-Based Violations: 2005-2015

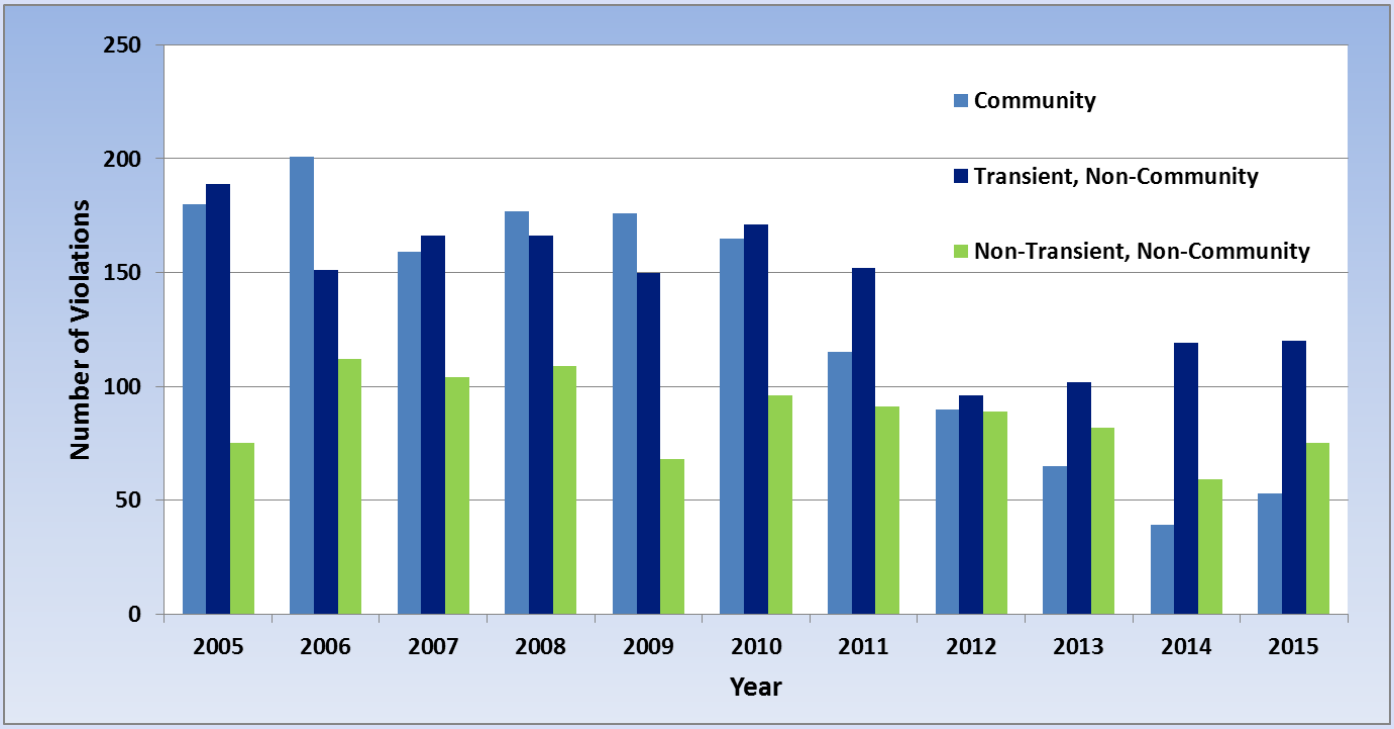


Public Water Systems: Non Health-Based Violations: 2005-2015

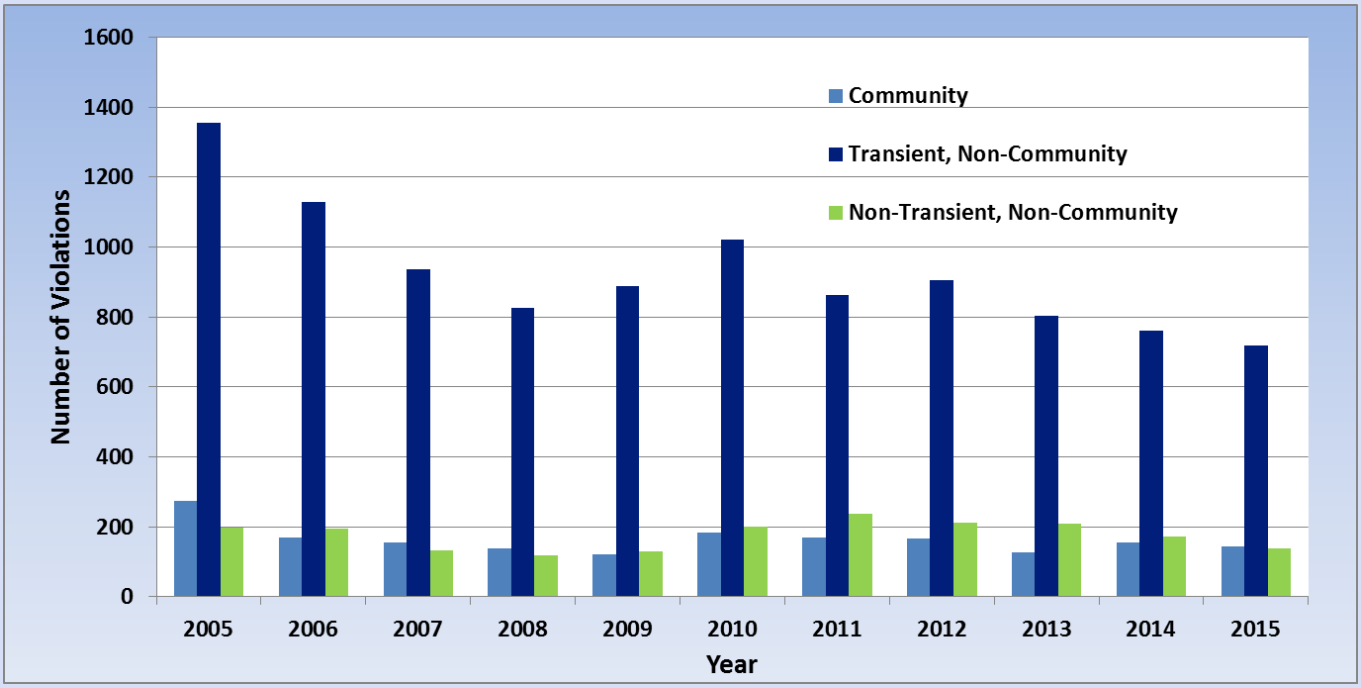


MEASURES

Health-Based Violations Issued by Public Water System Type: 2005-2014



Non Health-Based Violations Issued by Public Water System Type: 2005-2014



MEASURES

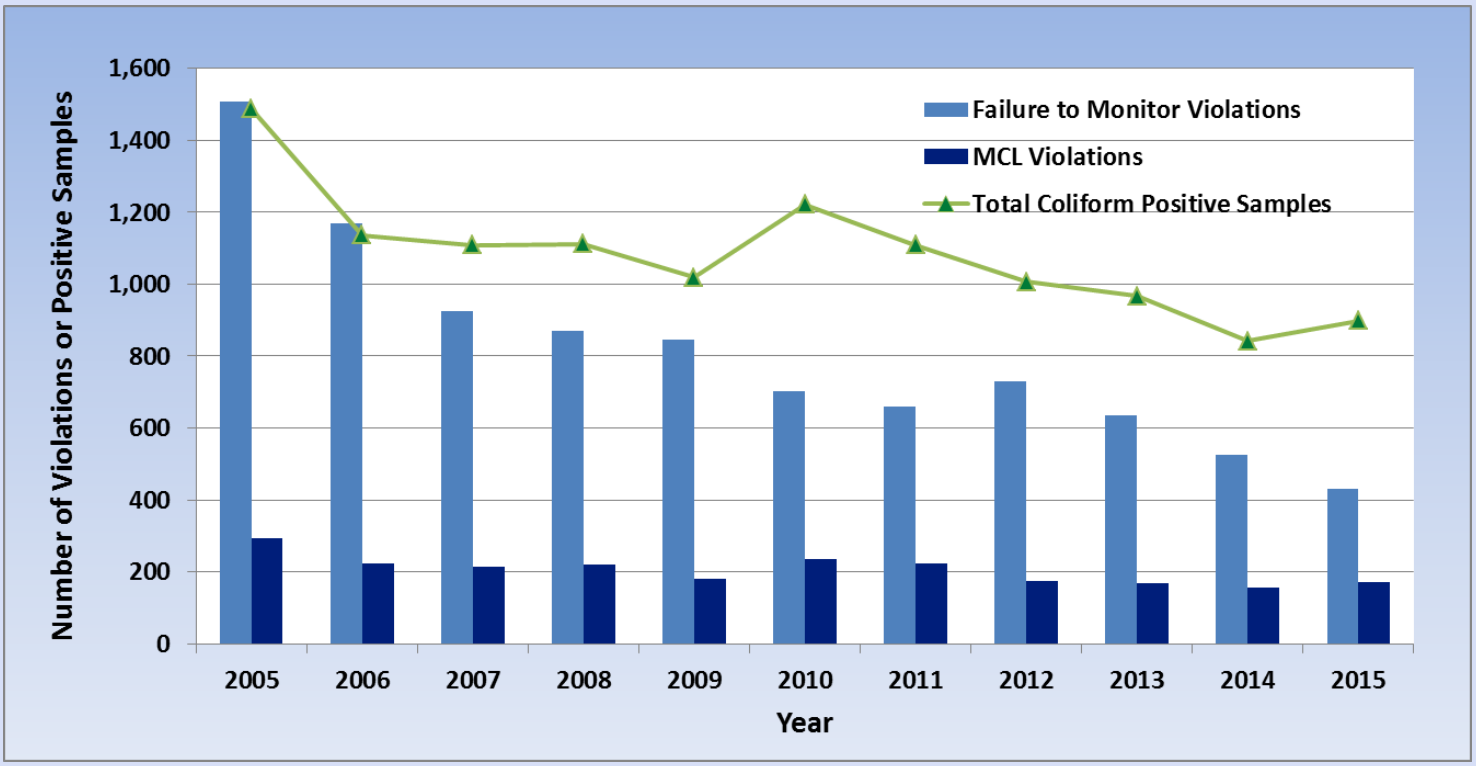
Total Coliform Bacteria: 2005-2015

Total coliform bacteria is used as an "indicator" organism to identify when microbiological contamination (potentially making people sick) may be present in the drinking water. All public water systems must test their water for total coliform bacteria on a regular basis. Many small systems are required to test only once per quarter, while the very largest systems in Maine must conduct dozens of tests each month. (For example, Portland Water District, Maine's largest water system, must test their water at least 120 times per month.)

Improper sampling for total coliform bacteria may result in bacteria positive samples. Therefore, when follow-up samples are collected to confirm the presence of total coliform, the results are clean. Consequently, many samples that initially tested positive for total coliform bacteria do not result in a violation for the public water system. A well -trained sampler knows how to collect a bacteria sample in a way that minimizes the risk of a false positive and also knows when to collect water samples to meet regulatory compliance.

Because all public water systems collect total coliform samples on a routine basis, compliance rates, including the number of total coliform positive samples, are strong indicators of the technical capability of public water systems.

The following graph shows violations incurred by public water systems for total coliform bacteria. "Failure to Monitor" violations are issued when a water system fails to collect and report required Total Coliform bacteria samples. "Maximum Contaminant Level," or "MCL" violations are issued to public water systems that receive sample results that are confirmed to be positive for total coliform bacteria. The graph also displays all samples that were reported to be positive for total coliform bacteria, not necessarily resulting in a MCL violation. As may be seen from this graph the overall trend for all three measures indicates better compliance rates and better system operations.



MEASURES

2015 Community Water Systems Performance Data

from the U.S. Environmental Protection Agency's Government Performance and Results Act (GPRA) for drinking water

	Community Systems	Community Population	Community "Person Months"
2015 U.S. Environmental Protection Agency National Target	**90%**	**92%**	**95%**
2015 Actual U.S. Environmental Protection Agency Region 1 Results	**89.6%**	**94.6%**	**98.3%**
2015 Maine Results	**94.4%**	**96.6%**	**99%**

Community Systems: Percent of community water systems meeting all health-based standards

Community Population: Percent population served by community water systems meeting all health-based standards

Community "Person Months": Percent of "person months" (i.e., all persons served by community water systems times 12 months) during which community water systems provide drinking water that meets all applicable health-based drinking water standards.

MEASURES

Site Visits to Public Water Systems: 2010-2015

Drinking Water Program inspectors provide on-site advice and assistance to public water systems regarding operation, maintenance, treatment, quality control, testing waivers and testing requirements. These inspectors also investigate complaints made by the public, provide waterborne disease investigation and provide technical advice during emergency situations.

The Drinking Water Program also partners with the Maine Rural Water Association to provide water systems with free, on-site technical assistance. Technical assistance is available for help with reviewing the operation of a treatment process, collecting samples, filling out reports, regulatory compliance assistance, leak detection and line location, and assistance in the creation of emergency response plans and vulnerability assessments.

	2010	2011	2012	2013	2014	2015
Number of Site	562	640	718	793	639	629

Sanitary Surveys Conducted: 2005-2015

Drinking Water Program inspectors conduct routine sanitary surveys for each public water system. A sanitary survey is a review of the water system to identify deficiencies and make recommendations for water system improvements. The sanitary survey also offers a chance for public water system operators to ask questions and learn about their requirements and responsibilities.

Community water systems and bottled water facilities are inspected every 3 years, while non-transient, non-community and transient water systems are inspected every 5 years.

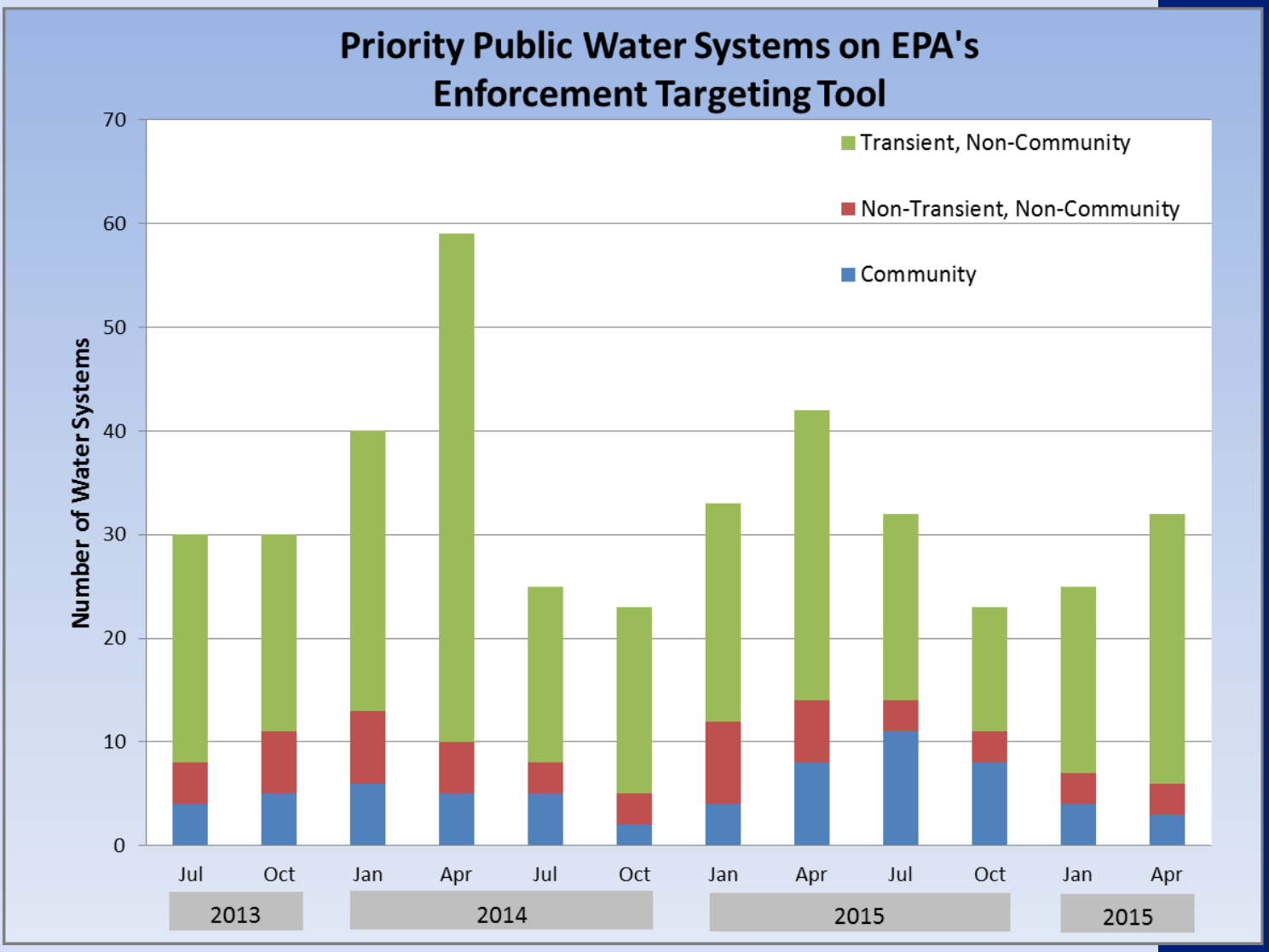
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of Sanitary	360	284	381	434	395	467	409	493	481	461	439

MEASURES

Enforcement: Serious Violators 2011-2015

One mechanism for determining which public water systems require enforcement action is the "Enforcement Targeting Tool." The United States Environmental Protection Agency extracts data from each primacy agency in the country, including the Maine Drinking Water Program, in order to identify public water systems with violations that do not appear to be resolved or addressed. The Enforcement Targeting Tool applies a set formula that is based on violation type, length of violation, type of public water system and population number served.

Any public water system scoring eleven (11) points or higher is considered "priority" status and expected to be addressed or resolved by the Maine Drinking Water Program within 60 days of the report. Each quarter, the program's enforcement staff research the accuracy of each priority public water system in Maine appearing on the Enforcement Targeting Tool list and report to the Environmental Protection Agency the progress or status of each system.



PUBLIC WATER SYSTEM RESPONSIBILITIES

OPERATION AND MAINTENANCE

Regardless of size and complexity, every public water system requires operation by people, and every piece of equipment requires some level of maintenance. Some water systems require licensed water operators with qualifications matching the complexity of the water system equipment. To ensure that public water systems serve safe drinking water to the public, inspections of all public waters systems are completed by trained Drinking Water Program inspectors every three or five years, depending on the type of public water system. These routine inspections are called sanitary surveys.

ROUTINE SAMPLING

Depending on the type of public water system, testing is required for a variety of contaminants on a routine basis. However, regardless of type, all water systems must routinely sample for total coliform bacteria and nitrates. The following table represents a general summary of sampling requirements by system type. Specific sampling requirements for public water systems may differ, based on a public water system's site-specific characteristics and water quality results.

	Total Coliform Bacteria	Nitrates	Inorganics	Volatile Organics	Synthetic Organics	Lead and Copper	Radionuclides	Disinfection Byproducts
Transient, Non-Community	Quarterly or monthly	Yearly						
Non-Transient, Non-Community	Quarterly or monthly	Yearly	Every 3 years	Every 3 years	Every 3 years	Every 3 years	Limited	Every 3 years
Community	Quarterly or monthly	Yearly	Every 3 years	Every 3 years	Every 3 years	Every 3 years	Every 9 years	Every 3 years

See Appendix A for complete list of regulated contaminants

PUBLIC WATER SYSTEM RESPONSIBILITIES

REPORTING TO MAINE DRINKING WATER PROGRAM

Sample Results

The certified laboratory conducting the analysis must report sample results to the Drinking Water Program within the timeframe set by the public water system's specific requirements. Although the certified laboratory submits sample results to the program, the public water system is ultimately responsible to ensure that their results are reported correctly and on time.

Monthly Operating Reports

All public water systems that add a chemical to their water systems for treatment are required to send in monthly operating reports by the tenth day of the following month.

REPORTING TO CONSUMERS

Consumer Confidence Reports

Community water systems must create and deliver an annual Consumer Confidence Report for the previous year to consumers and the Drinking Water Program by July 1 every year. The public water system must also certify to the Program that the Consumer Confidence Reports were delivered each year.

Public Notification

Depending on the type of violation incurred, a public water system may be required by the Public Notification Rule to provide public notice in a specific way to its consumers about the violation.

KEEPING MAINE'S DRINKING WATER SAFE

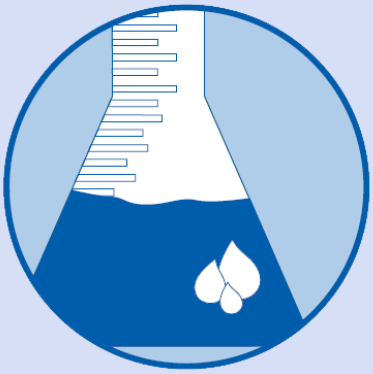
THE DRINKING WATER PROGRAM'S CORE MESSAGE

The Drinking Water Program promotes a "core message" of four principles designed to ensure that public water systems provide safe drinking water to their customers. The core message encourages water systems to continually work to identify, reduce and eliminate risks and vulnerabilities to their water systems. The Drinking Water Program works to convey this message to all of our public water systems on a daily basis through every interaction - whether it is a phone call, a site visit, a training session or article in our quarterly newsletter, the "Service Connection."

The Drinking Water Program promotes the four fundamental principles of our core message below, so that every public water system can help ensure they are keeping their drinking water safe:

Protect Your Source

Take Your Samples



Maintain Your Treatment

Inspect Your Pipes and Tanks

SOURCE PROTECTION

THE IMPORTANCE OF DRINKING WATER SOURCE PROTECTION

The ideal water source is a pure source of water in a remote, forested natural area with no sources of pollution influencing it. Most water sources, however, are geographically located near more densely populated areas, making them vulnerable to contamination. Whether it be from harmful chemicals or biological organisms (such as bacteria and viruses), contamination often comes from activities on the land near the source of water. Water systems, no matter how small or large, must produce safe water through a "multiple barrier approach." Source protection is the first and most important part of these barriers. If pollutants never get into a surface water (lake, river, stream) or groundwater (well) source, then people won't consume them, even if other barriers fail. Additionally, treating a contaminated drinking water source is typically much more costly than protecting it from contamination in the first place.

> According to the U.S. Environmental Protection Agency, the costs of Treating Contaminated Groundwater Supplies is on average 30-40 times more costly than preventing their contamination.
>
> *- "Benefits and Costs of Prevention: Case Studies of Community Wellhead Protection." Office of Groundwater and Drinking Water, U.S. Environmental Protection Agency. November 30, 1995.*

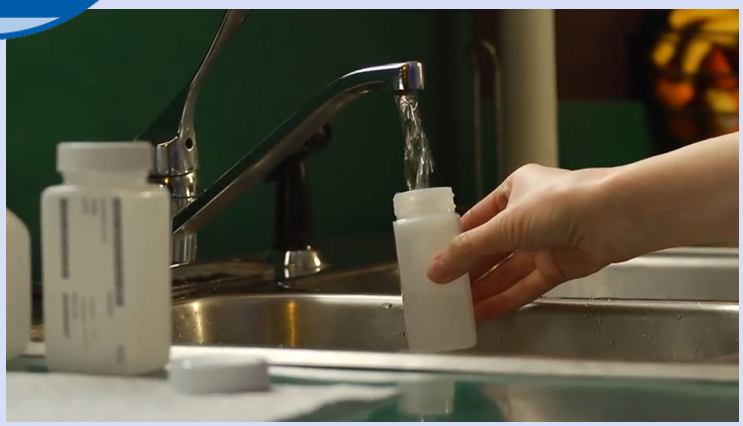
KEEPING CONTAMINATION AWAY

Approval of a new public water system well requires that contamination sources, particularly leach fields and underground fuel storage tanks, are set back a minimum distance from their drinking water well. The Maine Rules Relating to Drinking Water require all public water system wells to be 300 feet from potential contamination sources and 1,000 feet from underground fuel storage tanks. When these setback distances cannot be met for unavoidable reasons, such as limited property size or wetlands on the property, the Drinking Water Program developed setback waiver policies that help to mitigate the increased risk created by reduced setbacks. Mitigation may include increased sampling, well construction requirements or, in some cases, a pre-treated septic process or the installation of drinking water treatment to remove any fuel contaminants from the water supply. The Program's inspectors administer these setback waiver policies whenever a well with reduced setback is proposed for approval.

SAMPLING

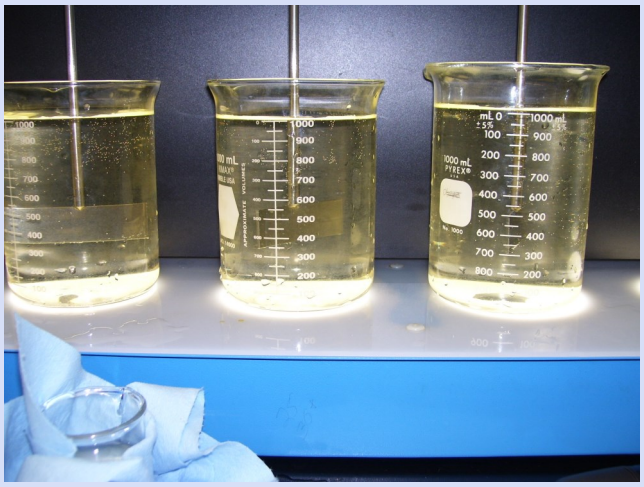
THE IMPORTANCE OF SAMPLING

In order to ensure the safety of the water being delivered, public water systems must test their water for regulated drinking water contaminants and report the results to the Drinking Water Program on a regular basis. The federal Safe Drinking Water Act set maximum levels (or standards) for 86 contaminants. Water systems monitor for these contaminants on a regular basis and report the results to the Drinking Water Program. Test results exceeding any of these standards may require treatment, replacement of source or blending with other sources to reduce the contaminant. Testing schedules are based on a frequency that is reasonable to protect public health, according to analyzing these test results.



ENSURING SAFE DRINKING WATER

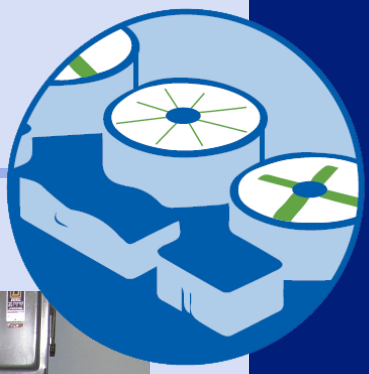
Drinking water sampling is not only a requirement of all public water systems, but it also provides assurance that the water is safe to drink. Sampling on a regular schedule provides an assurance that the water system is performing the way it's designed and can also help to signal if there is a problem within the water system, whether it be in the source, treatment system or out in the piping and tanks of the distribution system.



In 2015, 96.6% of Maine's population served by Community Public Water Systems received water meeting all health-based drinking water standards.

-Data based on average of quarterly data from the U.S. Environmental Protection Agency's Government Performance and Results Act (GPRA) for drinking water.

TREATMENT



THE IMPORTANCE OF DRINKING WATER TREATMENT

Public water systems come in all shapes and sizes, and no two are exactly the same. Whether publicly or privately owned, with a variety of designs, they all share the same goal: providing safe, reliable drinking water to the communities they serve. To meet this goal, many water systems must treat their water to remove harmful contaminants. The types of treatment provided by a specific public water system vary, depending on the size of the system, whether the source and the quality of the source water. Treatment systems are an important part of delivering safe drinking water for many public water systems throughout the state. However, treatment only works when the proper chemicals are applied in the right amounts, with the equipment and materials maintained and monitored. Regular and effective oversight of treatment systems help ensure the quality of the water delivered to the public.

MONITORING TREATMENT SYSTEMS THROUGH MONTHLY OPERATING REPORTS

All public water systems that add chemicals to their water must submit a monthly operating report to the Drinking Water Program. These reports help track the amount of chemical used, daily production of the water system, and the amount of chemical (residual) present in the distribution system. The Drinking Water Program reviews monthly operating reports to ensure that each public water system's treatment is operating properly to provide proper protection of the drinking water.

Approximately 57% of Maine's nearly 1,900 Public Water Systems have at least one type of water treatment system.

MAINTAINING PIPES AND STORAGE TANKS

THE IMPORTANCE OF MAINTAINING PIPES AND STORAGE TANKS

Storage tanks and a network of piping, (also known as a distribution system), is an integral part of a public water system's ability to provide safe, clean water to consumers. If not regularly inspected and properly maintained, contaminants can enter the drinking water through the pipes and tanks or could result in an inability to maintain the pressure needed to deliver water to each tap.

THROUGH A FUNDING PROGRAM ADMINISTERED BY THE MAINE DRINKING WATER PROGRAM, MAINE PUBLIC WATER SYSTEMS INVESTED OVER $10 MILLION TO MAINTAIN THEIR DRINKING WATER STORAGE AND PIPING INFRASTRUCTURE IN 2015.

- Data from the Maine Drinking Water State Revolving Fund (DWSRF)

APPENDIX A

Regulated drinking water contaminants

MICROORGANISMS:

- Total Coliform
- E. coli
- Turbidity
- Viruses
- Giardia lamblia
- Cryptosporidium
- Legionella
- Heterotrophic Plate Count (HPC)

INORGANIC CHEMICALS:

- Antimony
- Asbestos
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium (Total)
- Copper
- Fluoride
- Lead
- Mercury
- Nickel
- Nitrates
- Nitrites
- Selenium
- Thallium

ORGANIC CHEMICALS:

- Acrylamide
- Alachlor
- Atrazine
- Benzene
- Benzo(a)pyrene (PAH's)
- Carbofuran
- Carbon Tetrachloride
- Chlordane
- Chlorobenzene
- 2, 4-D
- Dalapon
- o-Dichlorobenzene
- p-Dichlorobenzene
- 1,2-Dichloroethane
- 1,1-Dichloroethylene
- Cis-1,2-Dichloroethylene
- Trans-1,2-Dichloroethylene
- Dichloromethane
- 1,2-Dichloropropane
- Di (2-ethylhexyl) adipate
- Di (2-ethylhexyl) phthalate
- Dinoseb
- Dioxin (2,3,7,8-TCDD)
- Diquat
- Endothall
- Endrin
- Epichlorohydrin
- Ethylbenzene
- Heptachlor
- Heptachlor epoxide
- Hexachlorobenzene
- Hexachlorocyclopentadiene
- Hexazanone (Velpar)
- Lindane
- Methoxychlor
- Methyl Tertiary Butyl Ether (MTBE)
- Oxamyl (Vydate)
- Polychlorinated biphenyls (PCBs)
- Pentachlorophenol
- Picloram
- Simazine
- Styrene
- Toluene
- Toxaphene
- 2,4,5 – TP (Silvex)
- 1,2,4- Trichlorobenzene
- 1,1,1-Trichloroethane
- 1,1,2-Trichloroethane
- Trichloroethylene
- Vinyl chloride
- Xylenes (total)

RADIONUCLIDES:

- Gross Alpha
- Uranium
- Radium 226 and Radium 228 (combined)
- Radon

DISINFECTANTS AND DISINFECTION BY-PRODUCTS

- Bromate
- Chloramines
- Chlorine
- Chlorine Dioxide
- Ozone
- Chlorite
- Haloacetic Acids (HAA5)
- Total Trihalomethanes (TTHM)

Department of Health and Human Services

Maine People Living Safe, Healthy and Productive Lives

Paul R. LePage, Governor

Mary C. Mayhew, Commissioner

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