

Pennsylvania Public Water System Compliance Report for 2009

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Pennsylvania Compliance Report for 2009 Public Water System

1.

Introduction to Pennsylvania's Safe Drinking Water Program

Section 1414(C)(3)(A)(i) of the amended federal Safe Drinking Water Act (SDWA) requires States with primacy to prepare and submit to the U.S. Environmental Protection Agency (EPA) an annual report on public water system violations. This report fulfills that requirement by providing a summary of the incidence of Pennsylvania public water system (PWS) maximum contaminant level (MCL), maximum residual disinfectant level (MRDL), significant monitoring/reporting (M/R), treatment technique (TT), consumer confidence report rule (CCR), and public notification (PN) violations for the calendar year 2009. The level of compliance and efforts being undertaken to provide safe drinking water to the residents and travelers of Pennsylvania are also highlighted. The full report is available on the Department of Environmental Protection (DEP) web site and in hard copy. See the last page of this report for details on how to obtain additional information.

Public Water System Definitions

Public Water System (PWS): A system that provides piped water for human consumption to at least 15 service connections or serves an average of at least 25 people for at least 60 days each year. PWSs can be community, nontransient noncommunity, or transient noncommunity systems.

Community Water System (CWS): A PWS that provides water to the same population year-round. Examples are municipal systems, authorities, and mobile home parks or residential developments with their own water supplies.

- **Large CWS** - Serves greater than 50,000 people.
- **Medium CWS** - Serves 3,301 - 50,000 people.
- **Small CWS** - Serves 3,300 or fewer people.

Nontransient Noncommunity Water System (NTNCWS): A PWS that is not a CWS, but that regularly serves at least 25 of the same people at least six months of the year. Examples include schools, factories, and hospitals that have their own water supplies.

Transient Noncommunity Water System (TNCWS): A system that caters to transitory customers in non-residential areas such as campgrounds, motels, and restaurants having their own water supplies.

Bottled Water System: A public water system which provides water for bottling in sealed bottles or other sealed containers.

Bulk Water Hauling System: A public water system which provides water piped into a carrier vehicle and withdrawn by a similar means into the user's storage facility or vessel.

Retail Water Facility: A public water system which provides water for bottling without the use of a water vending machine by dispensing unit servings of water in containers whether or not the containers are provided by the customers.

Vended Water System: A public water system which provides water for bottling through the use of one or more water vending machines.

Background

Under the authority of the 1974 Safe Drinking Water Act (SDWA), the EPA established the Public Water System Supervision (PWSS) Program. With the 1986 Amendments to the SDWA, EPA set national limits on contaminant levels in drinking water to ensure that the water is safe for human consumption. These limits are known as MCLs. For some regulations, EPA established treatment techniques in lieu of an MCL to control unacceptable levels of contaminants in drinking water. The Agency's regulations also establish how often public water systems monitor their water for contaminants and report the monitoring results to the states or EPA. Generally, the larger the population served by a water system, the more frequent the monitoring and reporting requirements. In addition, EPA requires PWSs to monitor for unregulated contaminants to provide data for future regulatory development. Finally, EPA requires PWSs to notify the public when they have violated these regulations. The 1996 amendments to the SDWA require public notification to include a clear and understandable explanation of the nature of the violation, its potential adverse health effects, steps that the PWS is undertaking to correct the violation and the possibility of alternative water supplies during the violation.

Drinking water first came under regulation in Pennsylvania in 1905 with the passage of the Public Water Supply Law. The 1905 law was passed in response to widespread disease outbreaks that had been attributed to microbiological contamination of public water supplies. Approximately 1,200 systems were regulated under the law for about 20 contaminants for which the U.S. Public Health Service had established drinking water standards. Public water supplies were regulated under the 1905 law for almost 80 years when a new wave of waterborne disease outbreaks necessitated the establishment of better authorities to protect public health.

The SDWA allows states and territories to seek EPA approval (primacy) to administer their own PWSS programs. The Pennsylvania Safe Drinking Water Act was signed into law in 1984 after several communities experienced waterborne disease outbreaks caused by the presence of *Giardia* in their drinking water. In the following year Pennsylvania was awarded primacy under the SDWA. The DEP's Bureau of Water Standards and Facility Regulation (formerly the Bureau of Water Supply and Wastewater Management) administered the PWSS program in 2009. Under the 1905 Public Water Supply Law, Pennsylvania led the nation in waterborne disease outbreaks, averaging eight to ten per year. Today, DEP regulates nearly 10,000 public water systems serving over ten million people. Through improved water quality regulation under the 1984 Act, waterborne disease outbreaks are now a very rare occurrence in Pennsylvania's public water systems.

In addition to this report, DEP prepares a separate semi-report on the financial, technical and educational assistance programs for Pennsylvania's water systems. The reporting requirements are part of DEP's work plan obligations under the set-aside grant for the drinking water program.

Sources of Drinking Water Contamination

Contaminants may enter drinking water before, during, or after treatment. The majority of PWSs treat their water, as necessary, to ensure that their customers receive water that is safe to drink. Some sources of drinking water contaminants are as follows:

Before Treatment

- Bacteria, viruses and protozoa from human or animal sources
- Turbidity in water caused by suspended matter such as clay, silt, and microscopic organisms
- Inadequately treated wastewater, sanitary sewer overflows, and leaking sewer lines
- Defective storage tanks
- Leaking hazardous landfills, ponds, and pits
- Pesticides, fertilizers, and other agricultural run-off
- Run-off from oil-slicked or salt-treated highways
- Underground injection of hazardous wastes
- Underground storage tanks
- Naturally-occurring metals such as arsenic and cadmium
- Decay products of naturally-occurring radionuclides such as radon, radium, and uranium
- Industrial chemicals, such as solvents

During Treatment

- Treatment malfunction or chemical overfeed
- By-products of disinfectants such as trihalomethanes and haloacetic acids

After Treatment

- Lead, copper, asbestos, and other materials from corroding pipes
- Microbes and sediment entering through leaking pipes or water line breaks
- Improper connections with other systems or cross-connections with non-potable water that allow contaminants to enter drinking water pipes
- Permeation of contaminants through certain pipe materials

Improved Public Health Protection

The reduction in waterborne disease outbreaks in Pennsylvania over the last 20 years is due in part to Pennsylvania's filtration requirements. On March 25, 1989, when the Commonwealth of Pennsylvania adopted the filtration regulations, 231 public water systems were using unfiltered surface water sources. These systems ultimately filtered or abandoned the sources. Filtration plants have been constructed for nearly all of the state's unfiltered surface water sources.

Currently, only 36 unfiltered surface and GUDI systems remain, while the number of surface and GUDI filtration plants has increased from 204 to 353. Pennsylvanians benefit from the improved public health protection provided by these filtration plants.

To assure that Pennsylvania's filtration plants maximize public health protection for their customers, DEP initiated the Filter Plant Performance Evaluation Program in 1988. DEP is also helping to prevent waterborne diseases through the Partnership for Safe Water Program and the Area Wide Optimization Program. These programs are a cooperative effort between DEP and plant personnel to assure workers optimize the removal of disease-causing organisms at their facilities.

In addition to these special efforts to improve the microbiological safety of drinking water, DEP currently regulates 97 primary contaminants and 15 secondary contaminants – an increase from about 20 in 1984. Current regulations are set for 16 inorganic contaminants, 5 radionuclides, turbidity, 8 microbial contaminants or indicator organisms, 3 disinfectants, 11 disinfection byproducts and 53 organic contaminants. Primary maximum contaminant levels (MCLs) have been set for 87 contaminants, secondary MCLs have been set for 15 contaminants and 10 contaminants have treatment technique requirements. See Chapter 2 for additional information.

Waterborne Disease Outbreaks

The Pennsylvania DEP has the responsibility of assuring that the drinking water industry delivers a safe and reliable supply of water to consumers through efficiently operated facilities. Water systems that derive some or all of their drinking water from surface water sources (including groundwater under the direct influence of surface water) serve over 8.4 million Pennsylvanians as well as millions of visitors to the state. As a result, Pennsylvania has a tremendous interest in the potential for waterborne diseases associated with surface water. Between 1971 and 1980, Pennsylvania reported 20 percent of all waterborne outbreaks in the United States – more than any other state in the nation. Since 1979, 8 documented waterborne giardiasis outbreaks and one cryptosporidiosis outbreak have occurred in the Commonwealth. These outbreaks had widespread health implications and cost families, businesses, and local/state governments millions of dollars. While the more significant outbreaks took place among communities that were served unfiltered surface or GUDI source water, the adoption of Pennsylvania's mandatory surface water filtration regulation has shifted the focus to filtration facilities that use surface or GUDI source water.

For Pennsylvanians, the bottom line is that reported waterborne diseases are on a steep decline. In fact, reported waterborne disease outbreaks associated with public drinking water are at an all-time low in Pennsylvania. Currently, there were no reported outbreaks since 2006.

Not all outbreaks are recognized, investigated, and then reported to federal agencies. The federal Centers for Disease Control's reports typically lag a few years while the agency compiles and analyzes national outbreak data from all fifty states. The Pennsylvania Department of Health provides DEP with more current information on waterborne disease outbreaks. The sensitivity of the disease surveillance system is affected by the following factors: the size of the outbreak; severity of disease caused by the outbreak; public awareness of the outbreak; routine laboratory testing for organisms; requirements for reporting cases of diseases; and resources available to the local health departments for surveillance and investigation of probable outbreaks. Thus, the surveillance system probably underreports the true number of outbreaks because of these factors.

With the help of local public health agencies, DEP and the Pennsylvania Department of Health are continuing to even further improve the state's disease detection, investigation and reporting system.

Reducing Lead In Drinking Water

Water coolers and home plumbing have long been identified as sources of lead in drinking water. Under the Lead and Copper Rule, DEP is working with water systems to reduce lead levels that may be caused by the distribution system and household plumbing fixtures by requiring treatment to address the corrosivity of the water.

Additionally, DEP has been implementing a surveillance program under the Pennsylvania Plumbing System Lead Ban and Notification Act (Lead Ban Act) since 1991. Under this legislative initiative, materials not meeting the definition of "lead-free" are banned from sale or use in all plumbing systems in Pennsylvania. Specifically, the Act prohibits the sale or use of 50/50 or 85/15 tin-lead acid core or solid wire solders or any leaded solder that does not contain a warning statement on the label and restricts the use of all other leaded solders to only non-plumbing uses.

Lead Ban surveillance activities have been done throughout the Commonwealth by summer interns for over 15 years. The annual surveillance conducted by an intern is the most effective method of educating the business community about the requirements of the Lead Ban Act. These surveillance activities include locating hardware stores, home centers, and other retail facilities in which solder is sold and educating these facilities (as well as solder wholesalers and manufacturers) of the provisions of the Lead Ban Act. There has been a significant reduction of the availability of banned solder (and in the number of facilities out of compliance) as a result of this effort because the majority of stores in violation of the Act are first time offenders.

Details of the 2009 Lead Ban Surveillance Project include:

- 378 stores were surveyed; of these, 306 sell solder.
- 283 of the 306 stores sell lead-free solder (48% sell *only* lead free solder);
- 13 stores (4.3%) were in violation of the PA Lead Ban Act;
- 11 (3.6%) were selling banned solder; and
- 2 (0.7%) were selling restricted solder in the plumbing section.

To view the *2009 Lead Ban Surveillance Project* report, click on the link below.

http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/DrinkingWaterPortalFiles/watersupply/pb_ban_rpt_2009.pdf

Monitoring/Reporting Requirements

All PWSs are required to supply drinking water that complies with the primary and secondary MCLs. However, monitoring and reporting (M/R) requirements are specific to each system type. All PWSs, at a minimum, conduct routine monitoring for total coliform bacteria, nitrate and nitrite, and if using a surface water source, conduct monitoring for other microbiological contaminants. In addition, CWSs and NTNCWSs conduct routine monitoring for other chemicals and radiological contaminants. DEP may require any PWS to conduct additional monitoring if DEP has reason to believe that the PWS is not in compliance with the MCLs, MRDLs, or treatment technique requirements.

In addition to MCL, MRDL, and TT violations, this Annual Compliance Report summarizes the number of *significant* M/R violations that occurred during the report year. For this report, significant M/R violations are generally defined as having taken no samples or no results were submitted during a compliance period for a particular contaminant. For the Surface Water Treatment Rule, a significant M/R violation occurs when fewer than 90% of the required samples are taken or no results are reported during a reporting interval.

Variances and Exemptions

Variances and exemptions to specific requirements under the Safe Drinking Water Act may be granted under certain circumstances. Occasionally, a PWS cannot meet the MCL due to the characteristics of the raw water sources, and no alternate sources are reasonably available. In such cases, a primacy state can grant the PWS a variance from the applicable primary drinking water regulation upon finding that the system has installed and is using the best available technology, treatment techniques, or other means which the EPA Administrator finds are available (cost is not a consideration in Pennsylvania). The state must find that the variance will not result in an unreasonable risk to health, and shall prescribe at the time the variance is granted a schedule in accordance with which the PWS must come into compliance with the MCL. In 2009, DEP received no new applications for a variance or exemption. There were no variances or exemptions in effect for any Pennsylvania PWSs during the 2009 report period.

Consumer Confidence Reports

To ensure that customers are aware of the quality of the drinking water supplied to them, community water systems have been required by Federal regulations to prepare an annual Consumer Confidence Report (CCR) since 1999. The CCR covering calendar year 2008 was due by July 1, 2009. Details about CCR violations may be found in Figure 12 of this report. DEP continued to work with water suppliers to improve the timeliness and quality of CCRs.

Public Notification

Public water systems are required to issue public notification (PN) to their consumers in response to a violation of an MCL, MRDL or TT requirement; for monitoring/reporting violations; and for other emergency situations. Public notices must contain minimum elements, including a description of the violation, actions consumers should take, and when the supplier expects to return to compliance. A system can incur a PN violation for failure to issue a complete notice that is delivered on time and in a manner appropriate to the violation/situation. In 2009, there were 1194 PN violations. Charts and tables in following sections of this report show the PN violation count by the rule violated.

Regulation Development

DEP published final revisions to the Public Notification Rule in the *Pennsylvania Bulletin* on May 9, 2009. The revisions strengthen the pre-planning and delivery requirements for Tier 1 violations/situations by expanding the Operation and Maintenance (O&M) and Emergency Response Plan requirements, and by mandating direct delivery of Tier 1 PN.

DEP published the final General Update to Chapter 109 in the on May 23, 2009. The General Update: (1) incorporates necessary federal requirements needed to obtain and/or maintain primacy for the Phase II/IIB/V, Filter Backwash Recycling Rule, Lead and Copper Rule, and Radionuclides Rule; (2) amends several sections to improve data quality; (3) coordinates efforts with several other drinking water regulatory packages, including Operator Certification and Environmental Laboratory Accreditation; and (4) clarifies several other existing requirements in order to improve compliance.

DEP published the final Stage 2 Disinfectants and Disinfection Byproducts Rule (DBPR) on December 26, 2009. The Stage 2 DBPR augments the Stage 1 DBPR and provides increased protection against the potential risks for cancer and reproductive and developmental health effects associated with disinfection byproducts by reducing peak and average levels of these contaminants in drinking water supplies. The final Stage 2 DBPR contains maximum contaminant level goals for chloroform, monochloroacetic acid and trichloroacetic acid; National Primary Drinking Water Regulations, which consist of MCLs and monitoring, reporting, and public notification requirements for total trihalomethanes and haloacetic acids; and revisions to the reduced monitoring requirements for bromate. The rule also specifies the best available technologies for the final MCLs.

DEP published the final Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) on December 26, 2009. The goal of this rule is to reduce the risk of disease caused by *Cryptosporidium* and other microorganisms by identifying the system at the greatest risk for source water contamination.

DEP published the final Groundwater Rule (GWR) on December 26, 2009. The GWR provides increased protection against microbial pathogens, specifically viral and bacterial pathogens, in public water systems that use ground water sources. A goal of the GWR is to identify and target ground water systems that are susceptible to fecal contamination because such contamination is the likely source of viral and bacterial pathogens in drinking water supplies. Another goal is to protect public health by requiring these higher risk systems to monitor, and when necessary, take corrective action.

The EPA promulgated the final Lead and Copper Short Term Revisions (LCRSTR) on October 10, 2007. The LCRSTR will amend several provisions of the Lead and Copper Rule to strengthen implementation of existing requirements regarding monitoring, treatment processes, public education, customer awareness, and lead service line replacement. DEP's proposed regulations were approved by the EQB on June 16, 2009, and were published in the *Pennsylvania Bulletin* on September 26, 2009 with a 30-day comment period.

The Unregulated Contaminant Monitoring Rule 2 (UCMR) is a direct federal implementation rule that establishes a monitoring program to gather occurrence data on unregulated contaminants. UCMR 2 includes both Assessment (List 1) and Screening Survey (List 2) monitoring. All PWSs serving more than 10,000 people, and a representative sample of PWSs serving less than 10,000 people are required to conduct List 1 monitoring for 10 contaminants. All PWSs serving more than 100,000 people, and select PWSs serving less than 100,000 people are required to conduct List 2 monitoring for 15 contaminants. Monitoring must be conducted during a 12-month period during January 2008 – December 2010. In Pennsylvania, 197 PWSs are participating in UCMR 2. During 2009, DEP supported the UCMR 2 program by: assisting systems with using the national database,

communicating the system's monitoring requirements and schedule; and sending out reminder letters.

In summary, 2009 was a very active year for regulation development in Pennsylvania's Safe Drinking Water Program. Work is continuing to roll-out implementation of the new rules.

2. Public Water System Profile and Compliance Summary

The following pages display some fundamental Pennsylvania PWS statistics, a table of the incidence of MCL, MRDL, TT, and significant monitoring violations, and graphics to illustrate the general picture of PWS compliance in Pennsylvania in 2009.

Data in the federal Safe Drinking Water Information System (SDWIS) may differ from the information in this report. The 2009 report data originates in the Pennsylvania Drinking Water Information System (PADWIS) from a snapshot dated May 18, 2010. DEP transmits the violation data from PADWIS to SDWIS several times a year. As a result, PADWIS and SDWIS may not match if the data extracts occurred on different dates. DEP is confident in the accuracy of the following fundamental statistics; the incidence of MCL, MRDL, TT, and significant monitoring violations; and the general picture of public water system compliance in Pennsylvania.

General Statistics

- Total Population of Pennsylvania: 12,604,767
- Percent of Population Served by Individual Wells: 12%
- Percent of Population Served by Community Water Systems: 85%
- 95 of 104 drainage basins in Pennsylvania are used as sources for public water systems. Major river basins include the Delaware, Susquehanna, Potomac and Ohio.
- 478 ground water basins are located in Pennsylvania.
- 82.3% of the population was covered by source water protection programs
- 96.6% of all CWSs have received a Surface Water Identification Program (SWIP) evaluation.*
- No confirmed waterborne disease outbreaks occurred during 2009..
- 2,995 on-site assessments (full inspections) were performed.
- 96.9% of the population served by CWSs with surface-water sources or ground water under the direct influence of surface water receive filtered water.*
- 78% of all surface water systems have optimized filtration treatment.
- 80 Filter Plant Performance Evaluations were performed during 2009.
- 97.9% of the population served by CWSs are protected by optimized corrosion control.*
- 94.0% of all children at day-care and school facilities that have their own water supply are protected by optimized corrosion control treatment.*
- Over 99.9% of the population served by CWSs are protected from nitrate/nitrite.*
- Over 99.9% of the population of CWSs are protected from carcinogenic contaminants.*

**Statistic compiled in June 2010*

Compliance Action Summary

Action	Number
Compliance Letters	4,836
Consent & Administrative Orders	127
Consent Assessments	41
Boil Water Advisories (Community Systems)	12
Boil Water Advisories (Noncommunity Systems)	56
Civil Penalties Collected	\$250,155.32

This year, compliance actions in the table above, are counted only once for each contaminant group for a PWS on a given date.

PWS Profile

Figure 1. Number of Pennsylvania Systems and Population Served by Size Category

SMALL	1,746	1,135	6,144	SMALL	940,071	401,677	773,512
MEDIUM	299	16	8	MEDIUM	3,721,926	88,577	40,000
LARGE	32	0	0	LARGE	6,095,032	0	0
TOTAL	2,077	1,151	6,152	TOTAL	10,757,029	490,254	813,512

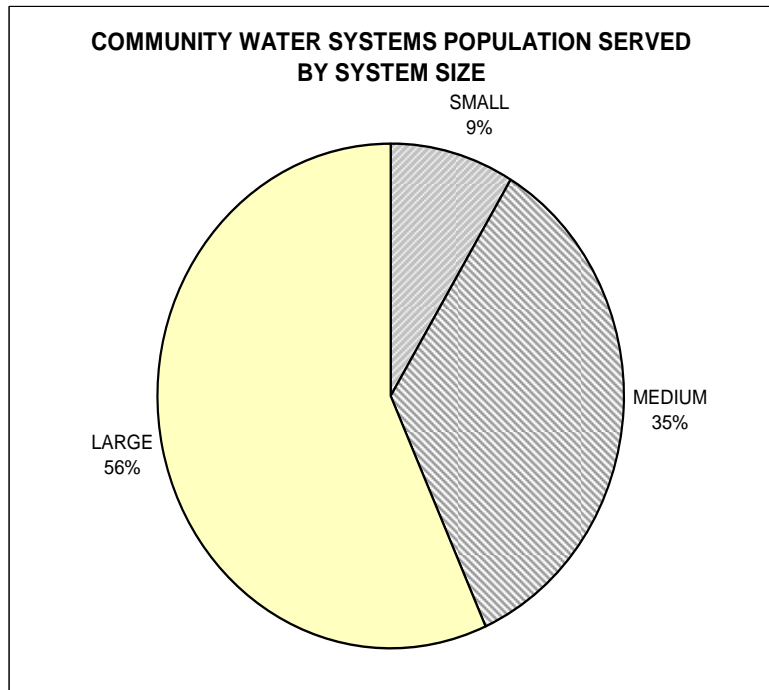
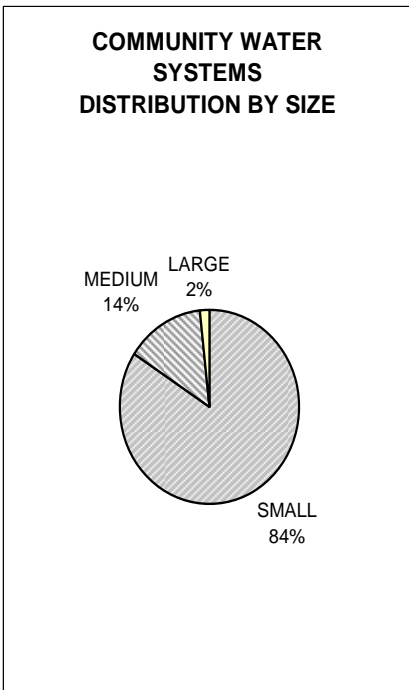


Figure 2. PWSs by Source and System Type

PWSs BY SOURCE AND SYSTEM TYPE

	CWS		NTNC		TNC		TOTAL	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
GROUND	1,605	77.3%	1,126	97.8%	6,085	98.9%	8,816	94.0%
SURFACE	472	22.7%	25	2.2%	67	1.1%	564	6.0%
TOTAL	2,077	100.0%	1,151	100.0%	6,152	100.0%	9,380	100.0%

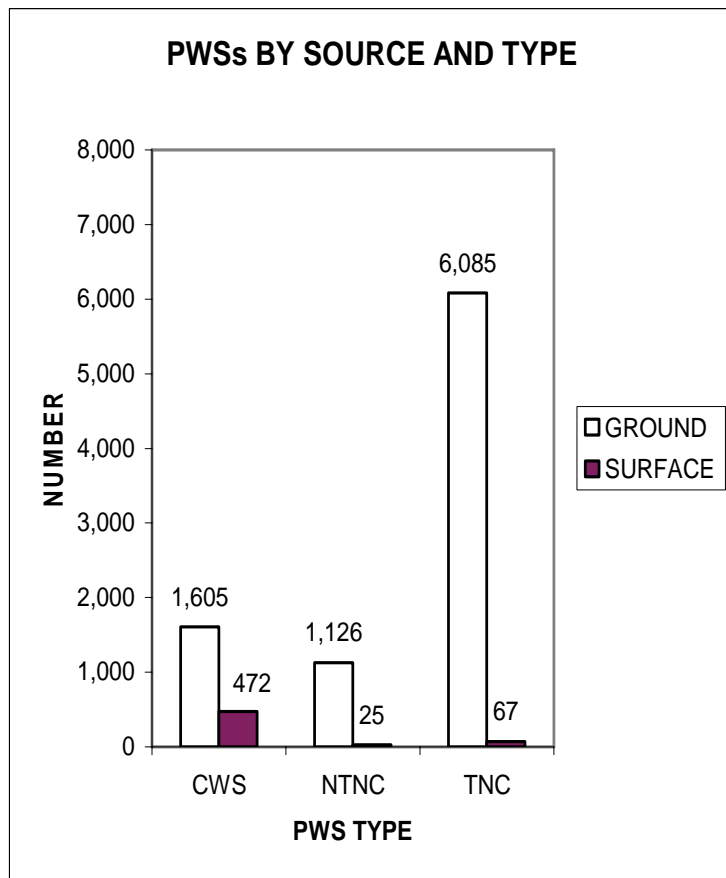
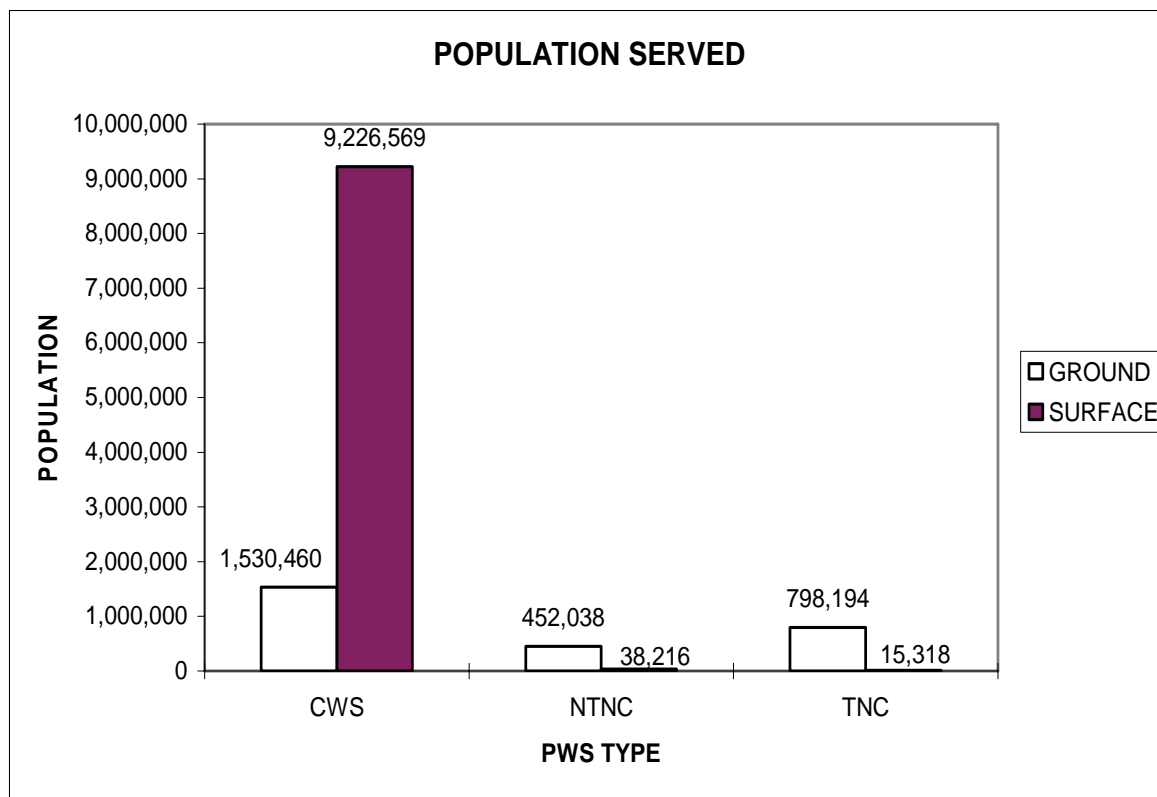


Figure 3. Population Served by Source Type

	CWS		NTNC		TNC		TOTAL	
	POPL SERVED	PER CENT	POPL SERVED	PER CENT	POPL SERVED	PER CENT	POPL SERVED	PER CENT
GROUND	1,530,460	14.2%	452,038	92.2%	798,194	98.1%	2,780,692	23.1%
SURFACE	9,226,569	85.8%	38,216	7.8%	15,318	1.9%	9,280,103	76.9%
TOTAL	10,757,029	100.0%	490,254	100.0%	813,512	100.0%	12,060,795	100.0%



Summary of Violations

The following definitions apply to the Summary of Violations table.

Consumer Confidence Reports (CCR): Community water systems must prepare annual water quality reports (CCRs or drinking water quality reports) for their customers. The first reports were due by October 1999. Subsequent reports are due each year by July 1. The reports tell where drinking water comes from, what's in it, and how consumers can help protect it. Violations associated with CCRs include late and missing reports and certification forms.

Stage 1 Disinfectants and Disinfection Byproducts Rule (DBPR): Beginning in January 2004, the Stage 1 DBPR applies to community water systems and non-transient non-community systems that add a disinfectant or oxidant to the drinking water during any part of the treatment process. Violations of the DBPR are reported for the following categories: M/R, MCL and MRDL.

Filtered Systems: Water systems that have installed filtration treatment [40 CFR 141, Subpart H].

Inorganic Contaminants: Non-carbon-based compounds such as metals, nitrates, and asbestos. These contaminants are naturally-occurring in some water, but can get into water through farming, chemical manufacturing, and other human activities. EPA has established MCLs for 15 inorganic contaminants [40 CFR 141.62].

Lead and Copper Rule (LCR): This rule established national limits on lead and copper in drinking water [40 CFR 141.80-91]. Lead and copper corrosion pose various health risks when ingested at any level, and can enter drinking water from household pipes and plumbing fixtures. Pennsylvania reports violations of the LCR in the following six categories:

Initial lead and copper tap M/R: A violation where a system did not meet initial lead and copper testing requirements, or failed to report the results of those tests to the State.

Follow-up or routine lead and copper tap M/R: A violation where a system did not meet follow-up or routine lead and copper tap testing requirements, or failed to report the results.

Treatment installation: Violations for a failure to install optimal corrosion control treatment system or source water treatment system which would reduce lead and copper levels in water at the tap. [One number is to be reported for the sum of violations in both categories].

Lead service line replacement: A violation for a system's failure to replace lead service lines on the schedule required by the regulation.

Public education: A violation where a system did not provide required public education about reducing or avoiding lead intake from water.

Maximum Contaminant Level (MCL): The highest amount of a contaminant that EPA allows in drinking water. MCLs ensure that drinking water does not pose either a short-term or long-term health risk. MCLs are defined in milligrams per liter (parts per million) unless otherwise specified.

Maximum Residual Disinfectant Level (MRDL): The maximum permissible level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. MRDLs are defined in milligrams per liter (parts per million) unless otherwise specified.

Monitoring: EPA specifies which water testing methods the water systems must use, and sets schedules for the frequency of testing. A water system that does not follow EPA's schedule or methodology is in violation [40 CFR 141].

States must report monitoring violations that are significant as determined by the EPA Administrator in consultation with the States. For purposes of this report, significant monitoring violations are major violations and they occur when no samples are taken or no results are reported during a compliance period. A major monitoring violation for the surface water treatment rule occurs when at least 10% of the required samples are not taken or results are not reported during the compliance period.

Organic Contaminants: Carbon-based compounds, such as industrial solvents and pesticides. These contaminants generally get into water through runoff from cropland or discharge from factories. EPA has set legal limits on 54 organic contaminants that are to be reported [40 CFR 141.61].

Radionuclides: Radioactive particles which can occur naturally in water or result from human activity. EPA has set legal limits on five radionuclides: gross alpha, radium-226, radium-228, uranium and beta particle/photon radioactivity [40 CFR 141].

Violations for these contaminants are to be reported using the following four categories:

Gross alpha: A running annual average value for alpha radiation above MCL of 15 picocuries/liter. Gross alpha includes radium-226 but excludes radon and uranium.

Combined radium-226 and radium-228: A running annual average value for combined radium from these two isotopes above MCL of 5 pCi/L.

Uranium: A running annual average value for alpha radiation above MCL of 30 ug/L.

Gross beta: A running annual average value for beta particle and photon radioactivity from man-made radionuclides above 4 millirem/year.

Reporting Interval: Annual Compliance Reports are to be submitted to EPA by July 1 for the preceding calendar year.

Surface Water Treatment Rule (SWTR): The SWTR establishes criteria under which water systems supplied by surface-water sources, or ground-water sources under the direct influence of surface water, must filter and disinfect their water [40 CFR 141, Subpart H]. The rule was amended in 2001 to include the Interim Enhanced SWTR requirements for surface water and GUDI systems serving at least 10,000 people. The rule was further amended in 2002 to include the Long Term 1 Enhanced SWTR requirements for surface water and GUDI systems serving less than 10,000 people. Violations of the SWTR (labeled "Filter Rule" in Figures 9, 13, and 14) are to be reported for the following four categories:

Monitoring, routine/repeat (for filtered systems): A violation for a system's failure to carry out required tests, or to report the results of those tests.

Treatment techniques (for filtered systems): A violation for a system's failure to properly treat its water.

Monitoring, routine/repeat (for unfiltered systems): A violation for a system's failure to carry out required water tests, or to report the results of those tests.

Failure to filter (for unfiltered systems): A violation for a system's failure to properly treat its water. Data for this violation code will be supplied to the States by EPA.

Total Coliform Rule (TCR): The TCR establishes regulations for microbiological contaminants in drinking water. These contaminants can cause short-term health problems. If no samples are collected during the one month compliance period, a significant monitoring violation occurs. States are to report four categories of violations:

Acute MCL violation: A violation where the system found fecal coliform or *E. coli*, potentially harmful bacteria, in its water, thereby violating the rule.

Non-acute MCL violation: A violation where the system found total coliform in samples of its water at a frequency or at a level that violates the rule. For systems collecting fewer than 40 samples per month, more than one positive sample for total coliform is a violation. For systems collecting 40 or more samples per month, more than 5% of the samples positive for total coliform is a violation.

Major routine and follow-up monitoring: A violation where a system did not perform any monitoring. [One number is to be reported for the sum of violations in these two categories.]

Sanitary Survey: A major monitoring violation if a system fails to collect 5 routine monthly samples if sanitary survey is not performed.

Treatment Techniques (TT): A water disinfection process that EPA requires instead of an MCL for contaminants that laboratories cannot adequately measure. Failure to meet other operational and system requirements under the SWTRs and LCR have also been included in this category of violation for purposes of this report.

Unfiltered Systems: Water systems that do not need to filter their water before disinfecting it because the source is very clean [40 CFR, Subpart H].

Violation: A failure to meet any state or federal drinking water regulation.

Figure 4.

**Pennsylvania—SUMMARY OF VIOLATIONS
MCL and MCL Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2009 to December 31, 2009**

	MCL (mg/L)	MCL Violations		Significant Monitoring/Reporting Violations	
		Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
ORGANIC CONTAMINANTS					
1,1,1-Trichloroethane	0.2	0	0	131	114
1,1,2-Trichloroethane	0.005	0	0	129	112
1,1-Dichloroethylene	0.007	0	0	130	113
1,2-Dichloroethane	0.005	0	0	130	113
1,2-Dichloropropane	0.005	0	0	130	113
1,2 Dibromo-3-Chloropropane (DBCP)	0.0002	0	0	26	18
1,2,4-Trichlorobenzene	0.07	0	0	132	114
2,3,7,8-TCDD (Dioxin)	3X10 ⁻⁸	0	0	27	21
2,4,5-TP (Silvex)	0.05	0	0	33	23
2,4-D	0.07	0	0	27	21
Alachlor (Lasso)	0.002	0	0	33	23
Atrazine	0.003	0	0	40	30
Benzene	0.005	0	0	129	112
Benzo (A) Pyrene	0.0002	0	0	35	23
BHC-gamma (Lindane)	0.0002	0	0	25	17
Carbofuran	0.04	0	0	22	16
Carbon Tetrachloride	0.005	0	0	132	115
Chlordane	0.002	0	0	23	16
cis-1,2-Dichloroethylene	0.07	0	0	130	113
Dalapon	0.2	0	0	0	0
Di(2-Ethylhexyl) Adipate	0.4	0	0	31	20
Di(2-Ethylhexyl) Phthalate	0.006	1	1	34	23
Dichloromethane (Methylene Chloride)	0.005	0	0	132	115
Dinoseb	0.007	0	0	0	0
Diquat	0.02	0	0	0	0
Endothall	0.1	0	0	22	16
Endrin	0.002	0	0	0	0
Ethylbenzene	0.7	0	0	129	112
Ethylene Dibromide (EDB)	0.00005	1	1	22	16

Pennsylvania Public Water System Compliance Report – 2009

	MCL (mg/L)	MCL Violations		Significant Monitoring/Reporting Violations	
		Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
Glyphosate	0.7	0	0	0	0
Heptachlor	0.0004	0	0	0	0
Heptachlor Epoxide	0.0002	0	0	0	0
Hexachlorobenzene (HCB)	0.001	0	0	0	0
Hexachlorocyclopentadiene	0.05	0	0	28	18
Methoxychlor	0.04	0	0	24	17
Monochlorobenzene (Chlorobenzene)	0.1	0	0	129	112
o-Dichlorobenzene	0.6	0	0	130	113
Oxamyl (Vydate)	0.2	0	0	20	14
p-Dichlorobenzene	0.075	0	0	130	113
Pentachlorophenol	0.001	0	0	24	16
Picloram	0.5	0	0	22	16
Simazine	0.004	0	0	34	22
Styrene	0.1	0	0	129	112
Tetrachloroethylene	0.005	0	0	129	112
Toluene	1	0	0	129	112
Total Polychlorinated Biphenyls (PCBS)	0.0005	0	0	3	3
Toxaphene	0.003	0	0	0	0
trans-1,2-Dichloroethylene	0.1	0	0	130	113
Trichloroethylene	0.005	5	2	132	115
Vinyl Chloride	0.002	0	0	1	1
Xylenes, Total	10	0	0	130	113
Subtotal		7	4	3,098	156
INORGANIC CONTAMINANTS					
Antimony, Total	0.006	0	0	58	53
Arsenic	0.010	70	28	154	135
Barium	2	0	0	52	48
Beryllium, Total	0.004	0	0	54	49
Cadmium	0.005	0	0	53	48
Chromium	0.1	0	0	53	48
Cyanide	0.2	0	0	44	43
Fluoride	2	0	0	47	44
Mercury	0.002	0	0	52	47
Nickel	0.1	0	0	54	50
Nitrate	10 (as Nitrogen)	65	45	398	336

	MCL (mg/L)	MCL Violations		Significant Monitoring/Reporting Violations	
		Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
Nitrite	1 (as Nitrogen)	0	0	263	218
Selenium	0.05	0	0	53	48
Thallium, Total	0.002	0	0	61	56
Subtotal		135	73	1,396	538
RADIONUCLIDE CONTAMINANTS					
Radium 226	-----	0	0	38	21
Radium 228	-----	0	0	38	21
Combined Radium (-226 & -228)	5 pCi/L	6	2	0	0
Combined Uranium	30 µg/L	3	1	37	20
Gross Alpha, Excl. Radon & Ura	15 pCi/L	0	0	32	18
Gross Beta & Photo Emitters	4 mrem/yr	0	0	0	0
38-Strontium-90	8 pCi/L	0	0	0	0
Tritium	20,000 pCi/L	0	0	0	0
Subtotal		9	3	145	80
TOTAL CHEMICAL CONTAMINANTS		151	80	4,639	1459
TOTAL COLIFORM RULE					
MCL, Acute	Present	62	61		
MCL, Monthly	Present	471	381		
Monitoring Routine & Repeat Major				1466	1,141
Subtotal		533	442	1466	1,141

Figure 5A.

Pennsylvania—SUMMARY OF VIOLATIONS
Surface Water Treatment/IESWTR and Lead and Copper Rules
Treatment Techniques (TT) and TT Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2009 to December 31, 2009

	Treatment Technique Violations		Significant Monitoring/Reporting Violations	
	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
SURFACE WATER TREATMENT RULE/IESWTR				
Filtered systems				
Monitoring, routine/repeat			216	57
Treatment techniques	51	5		
Unfiltered systems				
Monitoring, routine/repeat			14	7
Treatment techniques	5	2		
Subtotal	56	7	230	64
LEAD AND COPPER RULE				
Initial lead and copper tap M/R			22	18
Follow-up or routine lead and copper tap M/R			29	26
Treatment installation/technique	8	8		
Subtotal	8	8	51	44

Figure 5B.

Pennsylvania—SUMMARY OF VIOLATIONS
Disinfectants and Disinfection Byproducts
MCL, MRDL, TT and MCL, MRDL, TT Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2009 to December 31, 2009

	MCL (mg/L)	Type	MCL, MRDL and TT Violations		Significant Monitoring/Reporting Violations	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
DISINFECTANTS/ DISINFECTION BYPRODUCTS CONTAMINANTS						
Bromate	0.01	MCL	1	1	6	6
Chloramine	4.0	TT	0	0	0	0
Chlorine	4.0	TT	30	9	1591	619
Chlorine Dioxide	0.8	MR	0	0	0	0
Chlorite	1.0	MR	0	0	0	0
Total Alkalinity		PN	0	0	90	35
Total Organic Carbon		TT	29	19	72	33
Haloacetic Acids (Five)	0.06	MCL	19	8	58	54
Trihalomethanes	0.08	MCL	61	28	54	52
Subtotal			140	65	1871	799

Figure 6.

Pennsylvania—SUMMARY OF VIOLATIONS
MCL, MRDL, Treatment Technique, and Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2009 to December 31, 2009

	Number of Violations	Number Of Systems
GRAND TOTAL	11,997	2,779

NOTE: Grand totals include 139 consumer confidence reporting violations involving 139 community water systems and 1,194 Public Notification violations.

Violations Summary by Violation Type and PWS Type and Size

Figure 7.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
TOTAL COLIFORM RULE**

	M/R	MCL	PN
SMALL	173	58	81
MEDIUM	7	22	10
LARGE	0	0	0
TOTAL	180	80	91

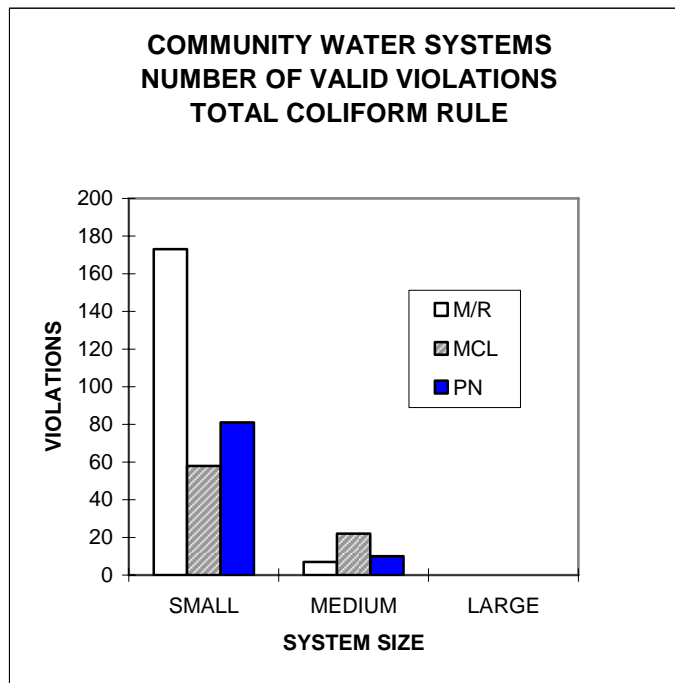


Figure 8.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
CHEMICALS - RADIONUCLIDES**

	M/R	MCL	PN
SMALL	2,250	59	0
MEDIUM	217	6	0
LARGE	1	0	0
TOTAL	2,468	65	0

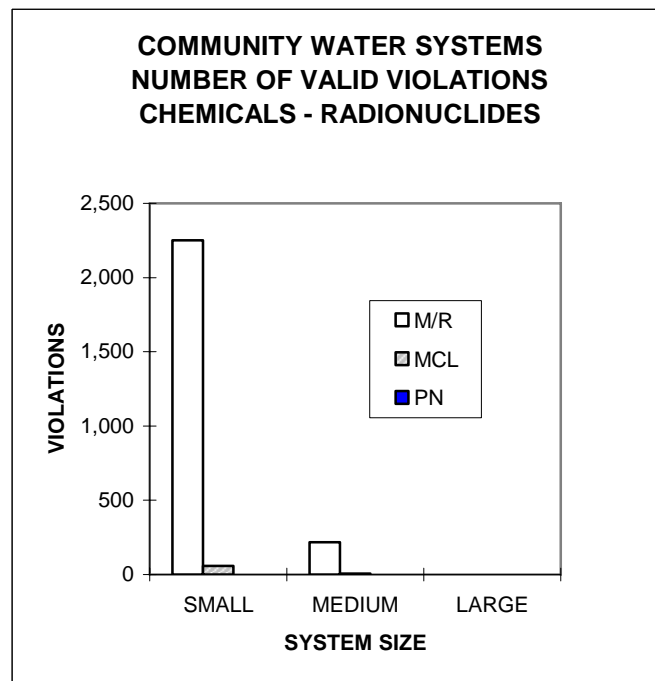


Figure 9.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
FILTER RULE**

	M/R	TT	PN
SMALL	111	8	57
MEDIUM	65	47	8
LARGE	5	1	0
TOTAL	181	56	65

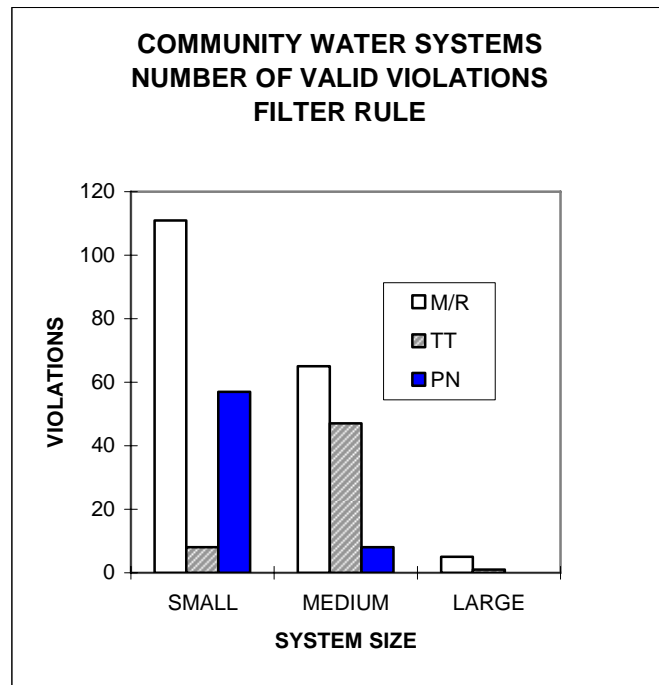


Figure 10.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
LEAD AND COPPER RULE**

	M/R	TT	PN
SMALL	18	2	16
MEDIUM	0	0	0
LARGE	0	0	0
TOTAL	18	2	16

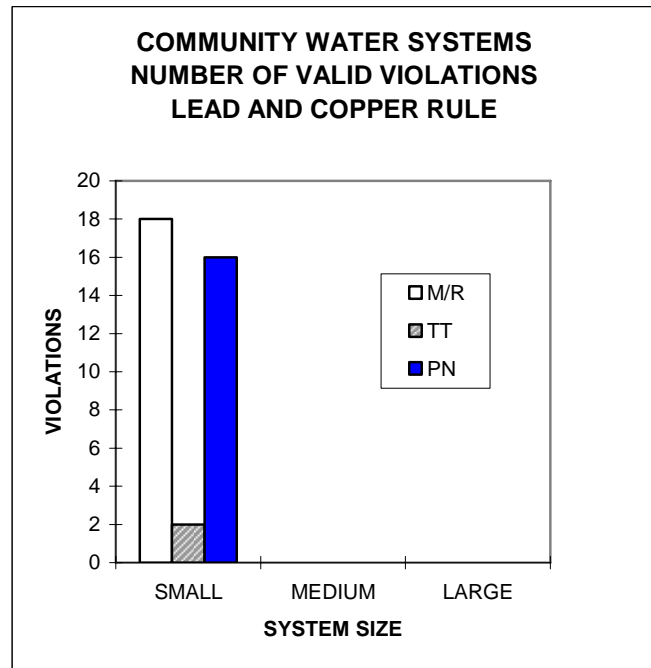


Figure 11.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
DISINFECTANTS/BYPRODUCTS**

	M/R	MCL	MRDL	T/T	PN
SMALL	1,283	53	0	19	289
MEDIUM	252	24	0	32	76
LARGE	6	0	0	0	0
TOTAL	1,541	77	0	51	365

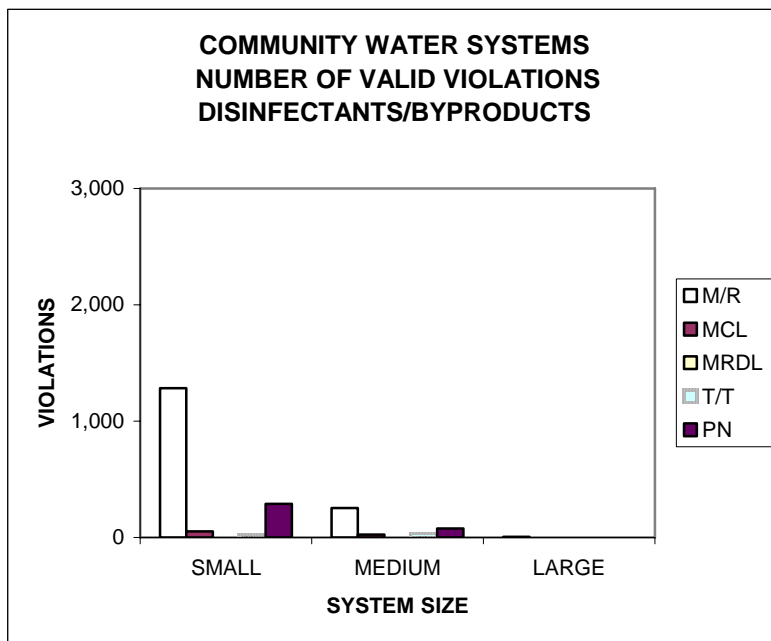


Figure 12.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
CONSUMER CONFIDENCE REPORTS**

	M/R
SMALL	132
MEDIUM	6
LARGE	1
TOTAL	139

Violations for missing reports.

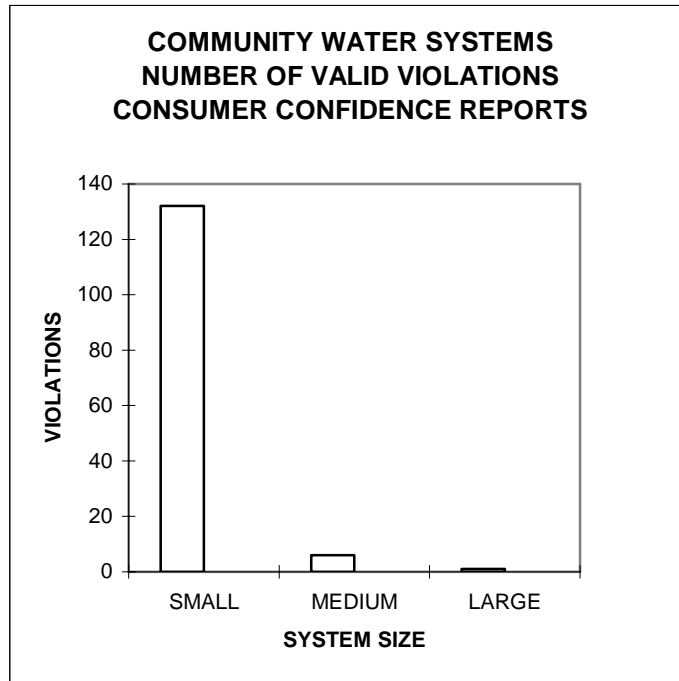


Figure 13.

**NONTRANSIENT NONCOMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS**

	M/R	MCL	MRDL	TT	PN
TCR	89	55	0	0	47
CHEM/RAD	1,552	48	0	0	0
FILTER	31	0	0	0	1
LCR	33	0	0	6	10
DBPR	265	4	0	7	52
TOTAL	1,970	107	0	13	110

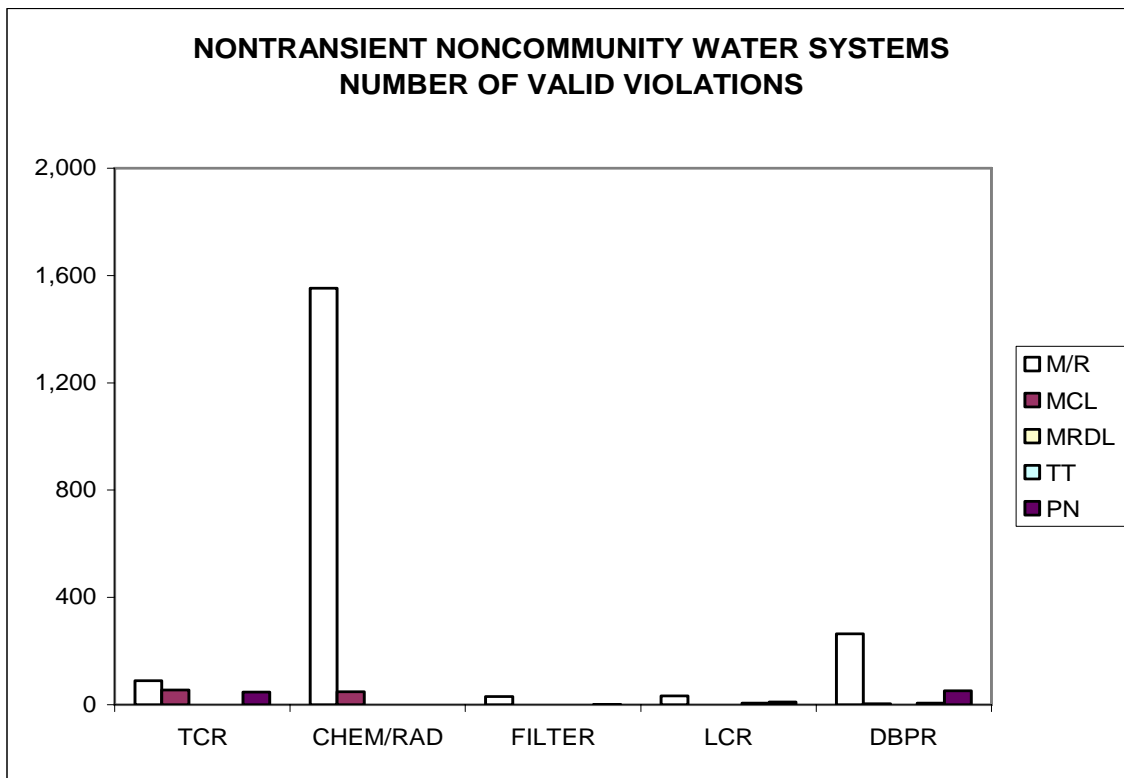
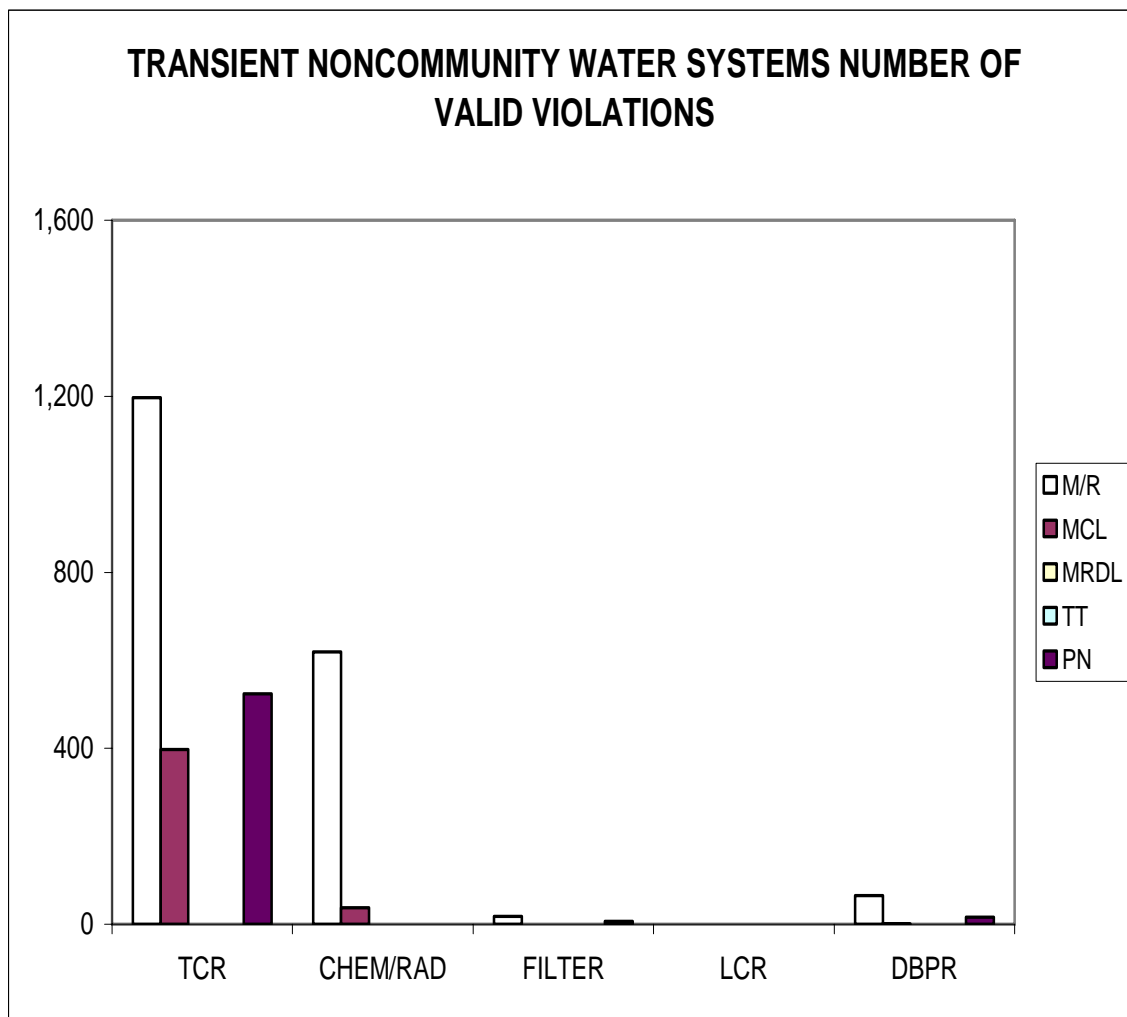


Figure 14.

**TRANSIENT NONCOMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS**

	M/R	MCL	MRDL	TT	PN
TCR	1,197	397	0	0	524
CHEM/RAD	619	38	0	0	0
FILTER	18	0	0	0	7
LCR	0	0	0	0	0
DBPR	65	1	0	0	16
TOTAL	1,899	436	0	0	547



Compliance Rates

A public water system is counted as being in compliance if there were no violations during the year. A public water system is counted as out of compliance if there was any time period within the year when there was an outstanding violation. Being counted as out of compliance does not imply that the violation spanned the entire year.

Figure 15.

**COMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE FOR
MONITORING AND REPORTING**

	SYSTEMS POPULATION	
SMALL	62.1%	66.6%
MEDIUM	66.9%	69.8%
LARGE	78.1%	50.7%

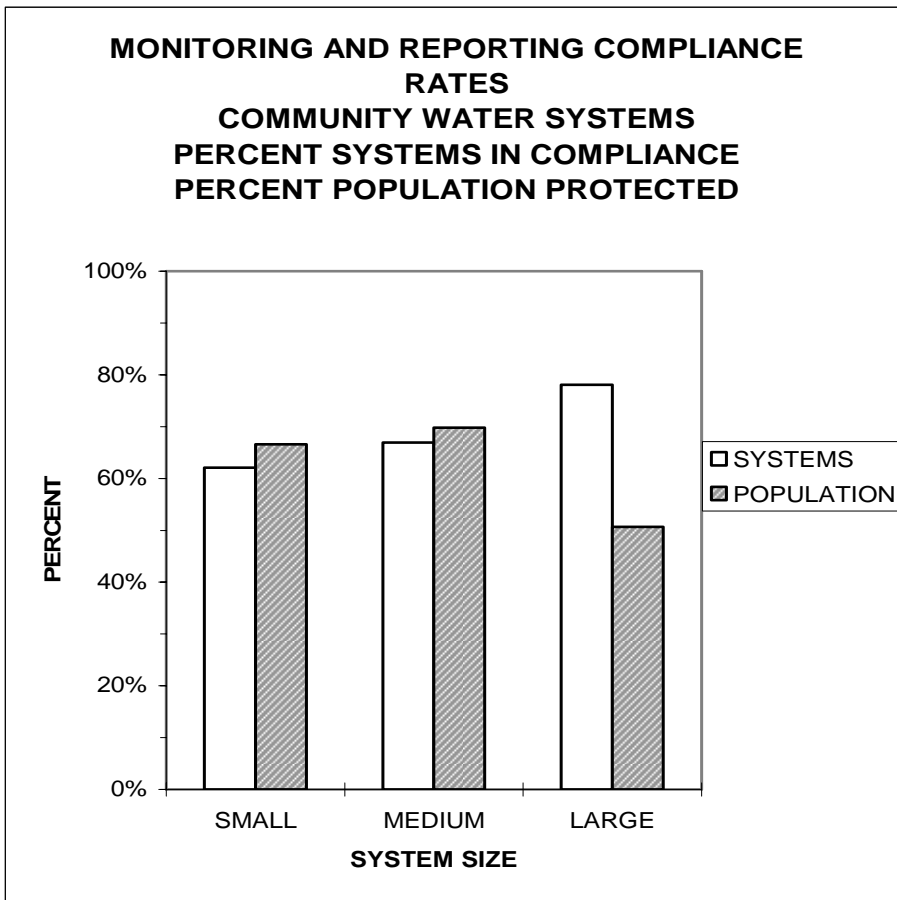


Figure 16.

**COMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE FOR
MAXIMUM CONTAMINANT LEVELS**

	SYSTEMS POPULATION	
SMALL	95.0%	93.5%
MEDIUM	91.3%	91.8%
LARGE	100.0%	100.0%

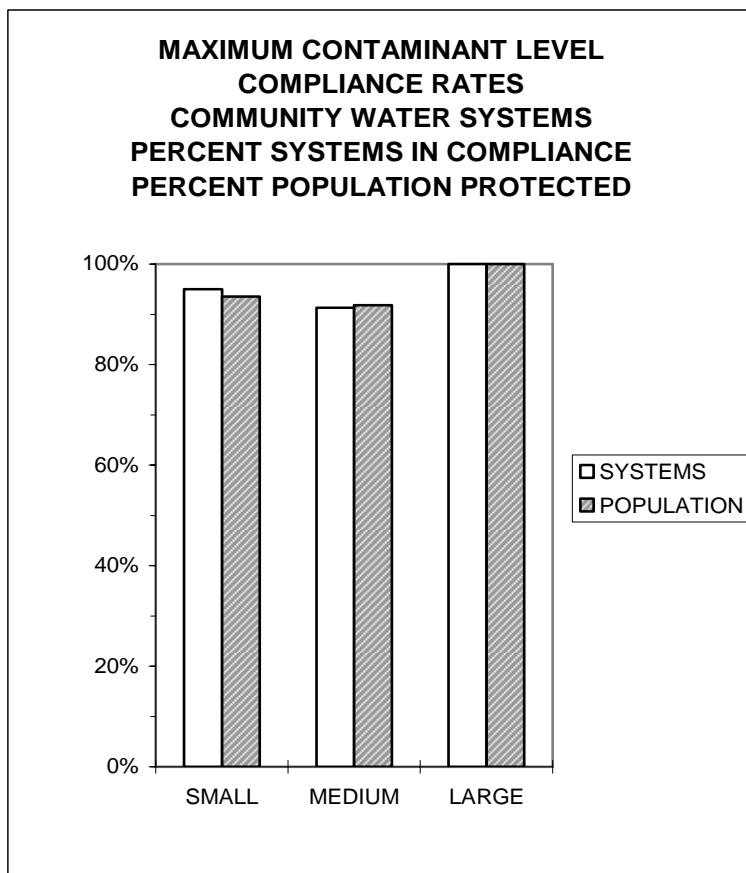


Figure 17.

**COMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE FOR
TREATMENT TECHNIQUES**

SYSTEMS POPULATION		
SMALL	99.0%	98.2%
MEDIUM	96.3%	97.3%
LARGE	96.9%	98.6%

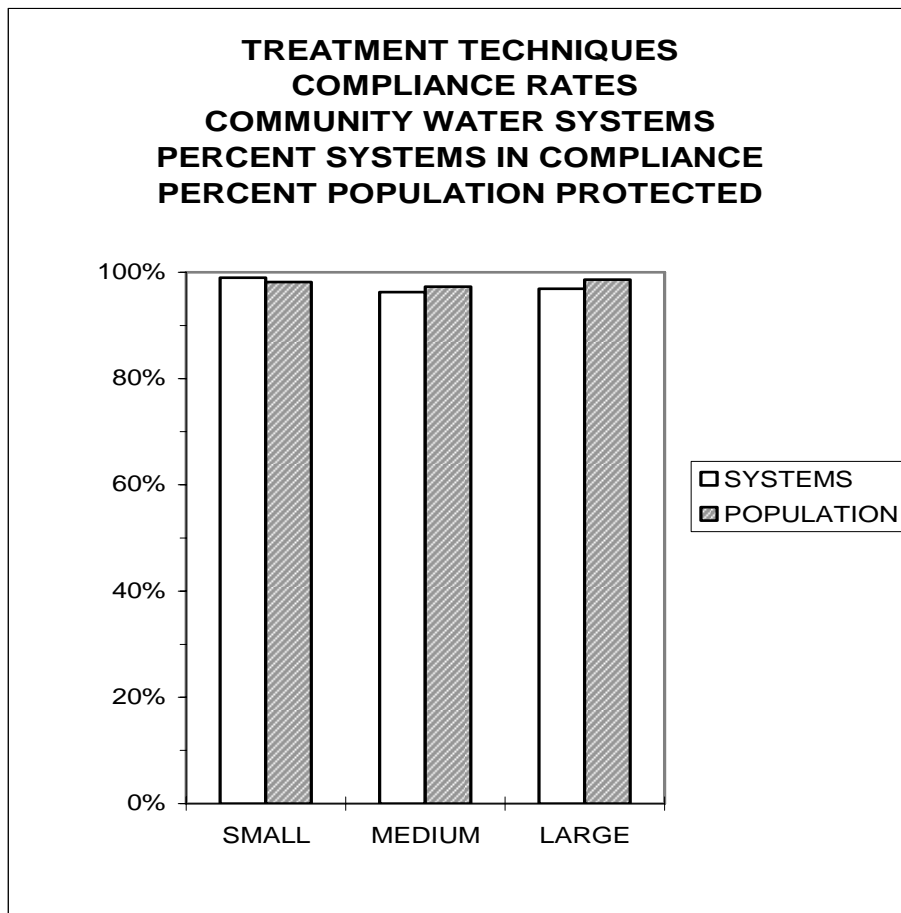


Figure 18.

**COMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE FOR
MAXIMUM RESIDUAL DISINFECTANT LEVELS**

	SYSTEMS POPULATION	
SMALL	100.0%	100.0%
MEDIUM	100.0%	100.0%
LARGE	100.0%	100.0%

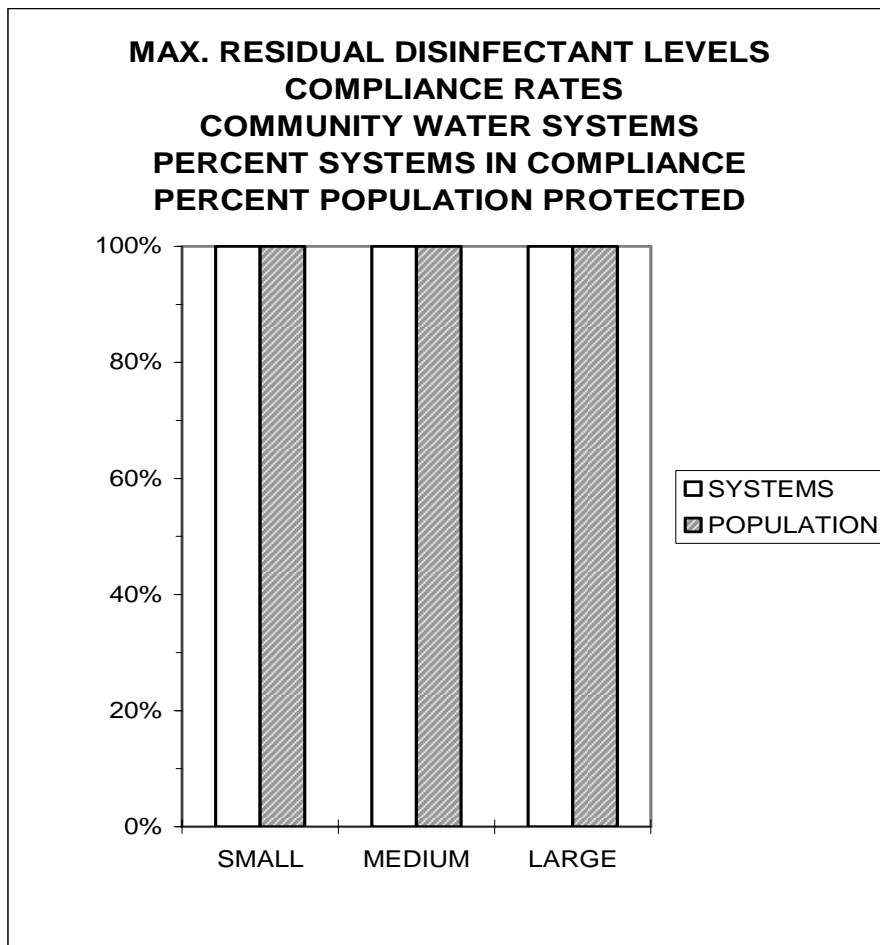


Figure 19.

**NONTRANSIENT NONCOMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE**

	SYSTEMS POPULATION	
M/R	75.2%	73.1%
MCL	94.5%	92.1%
MRDL	100.0%	100.0%
TT	99.4%	99.7%
PN	93.0%	91.7%

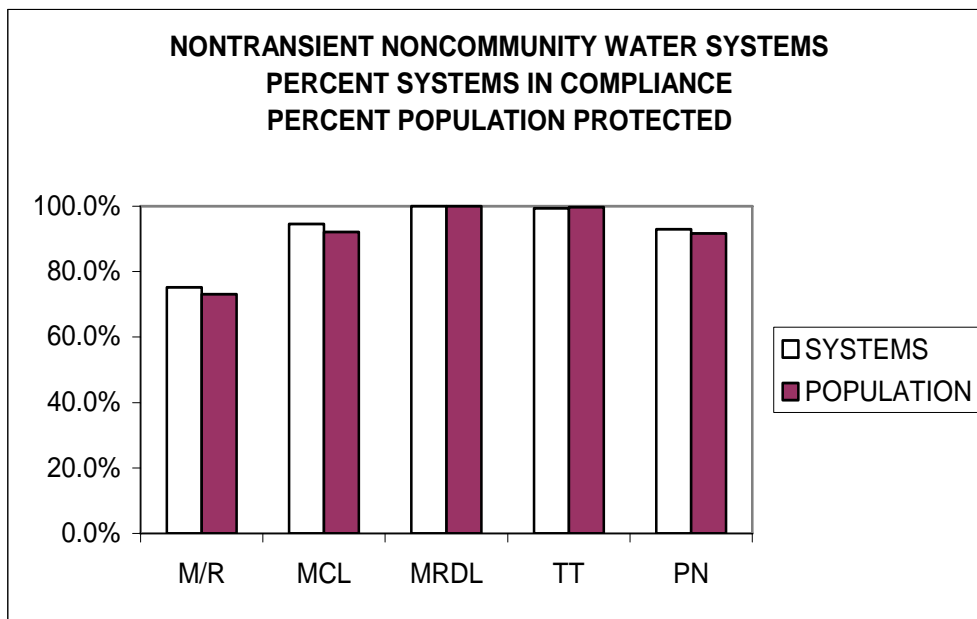


Figure 20.

**TRANSIENT NONCOMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE**

	SYSTEMS POPULATION	
M/R	82.4%	83.7%
MCL	94.9%	95.1%
MRDL	100.0%	100.0%
TT	100.0%	100.0%
PN	93.0%	92.6%

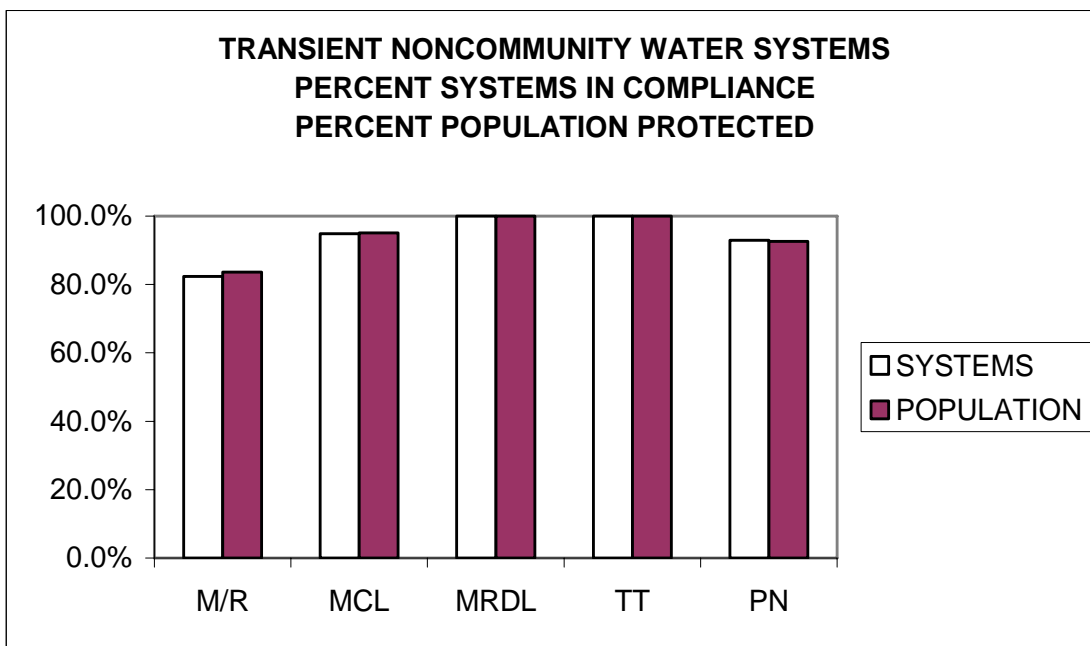


Figure 21.

**ALL PUBLIC WATER SYSTEMS
PERCENT IN COMPLIANCE**

	SYSTEMS	POPULATION
M/R	77.2%	61.0%
MCL	94.8%	96.3%
MRDL	100.0%	100.0%
TT	99.6%	98.3%
PN	92.3%	95.6%

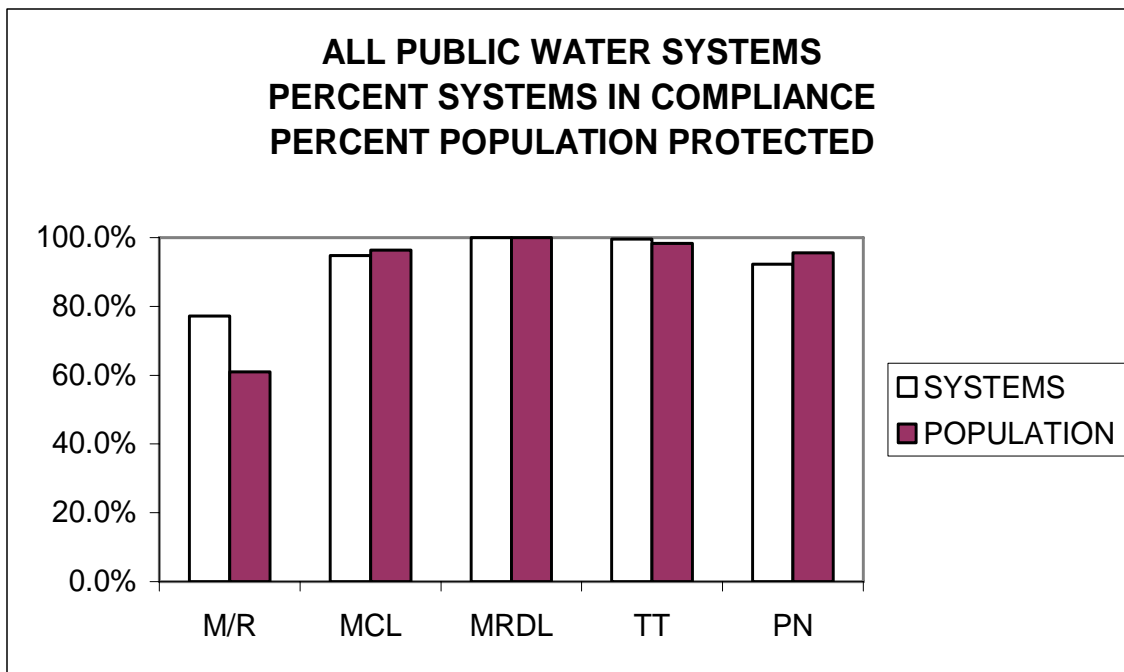
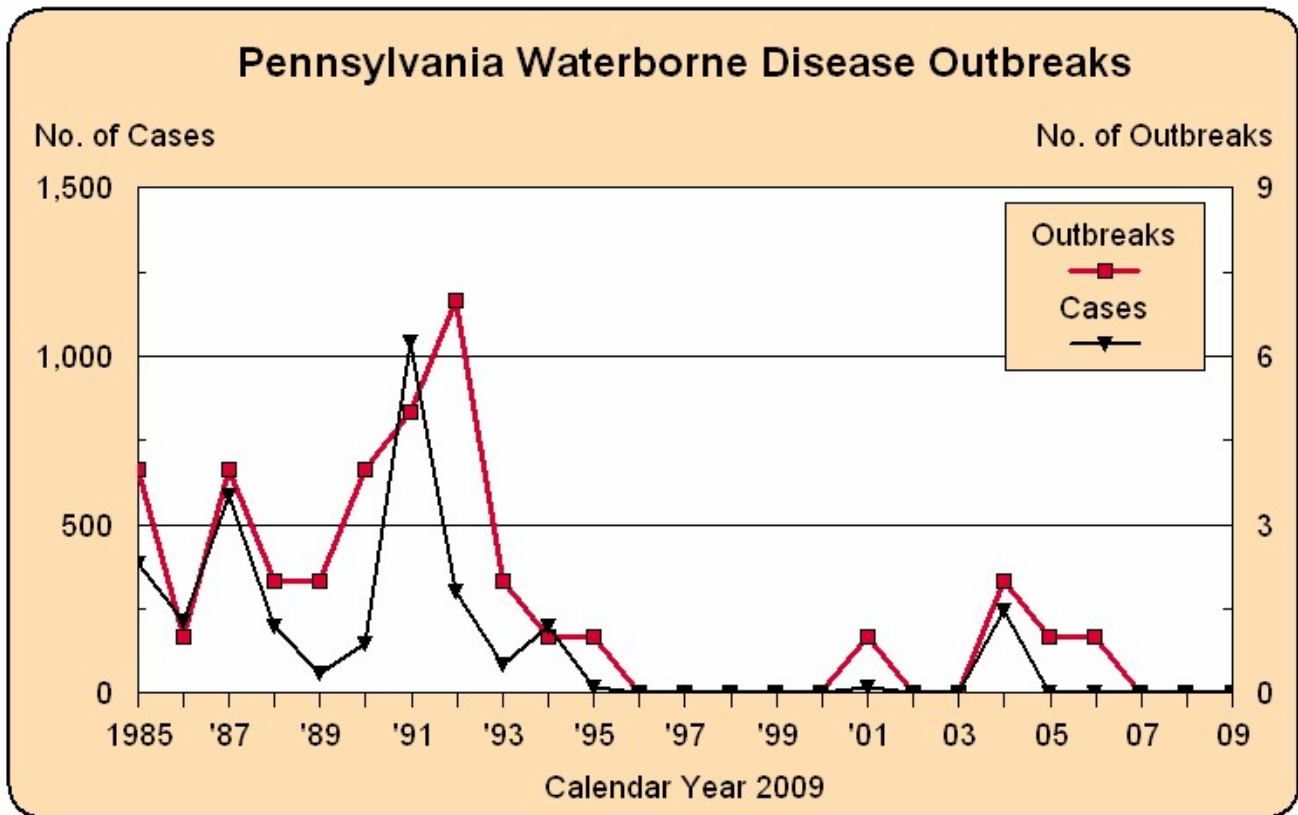


Figure 22. The U.S. Centers for Disease Control and Prevention (CDC) and the U.S. Environmental Protection Agency periodically release disease information. The reports typically lag a few years while the agencies compile and analyze national outbreak data from all fifty states. CDC’s last report included data up to and including 2006. According to the Pennsylvania Department of Health no waterborne disease outbreaks related to drinking water were reported in Pennsylvania during the period of 2007 through 2009. The following graph shows the occurrence of waterborne diseases in Pennsylvania that were caused by viruses, bacteria and protozoa—the three main culprits in disease outbreaks. The graph reveals a declining trend in the number of people (cases) affected by waterborne disease outbreaks.



3. Discussion and Conclusions

Since the Safe Drinking Water Act was reauthorized in 1998, federal and state regulations have undergone a rapid evolution, with 17 new regulations being promulgated. Five of these regulations were promulgated in 2009. As a result, public health standards have become more protective. However, the cumulative affect of the new regulations has led to a steep learning curve and a severe shortfall in resources, and many water suppliers and state agencies are struggling to keep pace.

In 2009, a large majority of Pennsylvanians received water from public water systems that reported no violations of health-based standards. The trend in compliance rates over the last nine years indicates a consistently high compliance rate for health-based standards. The compliance rate for meeting all monitoring and reporting requirements is on the rise, following a low of 70% in 2004. In 2009, 77% of all public water systems were in compliance with monitoring and reporting requirements. Refer to Figure 23 and 24 for more details about compliance trends.

Figure 23. Compliance Trends – Percent of All Public Water Systems in Compliance

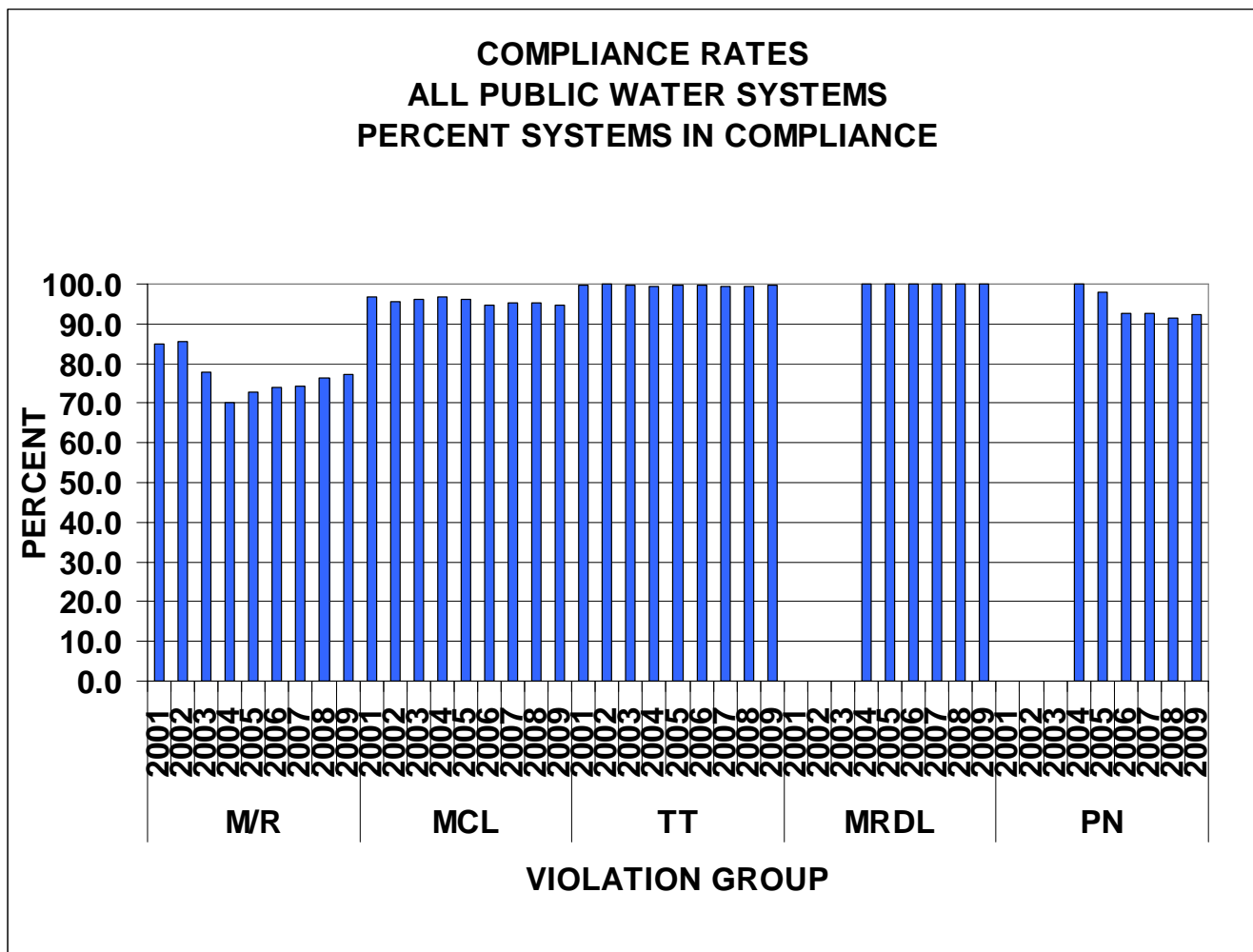
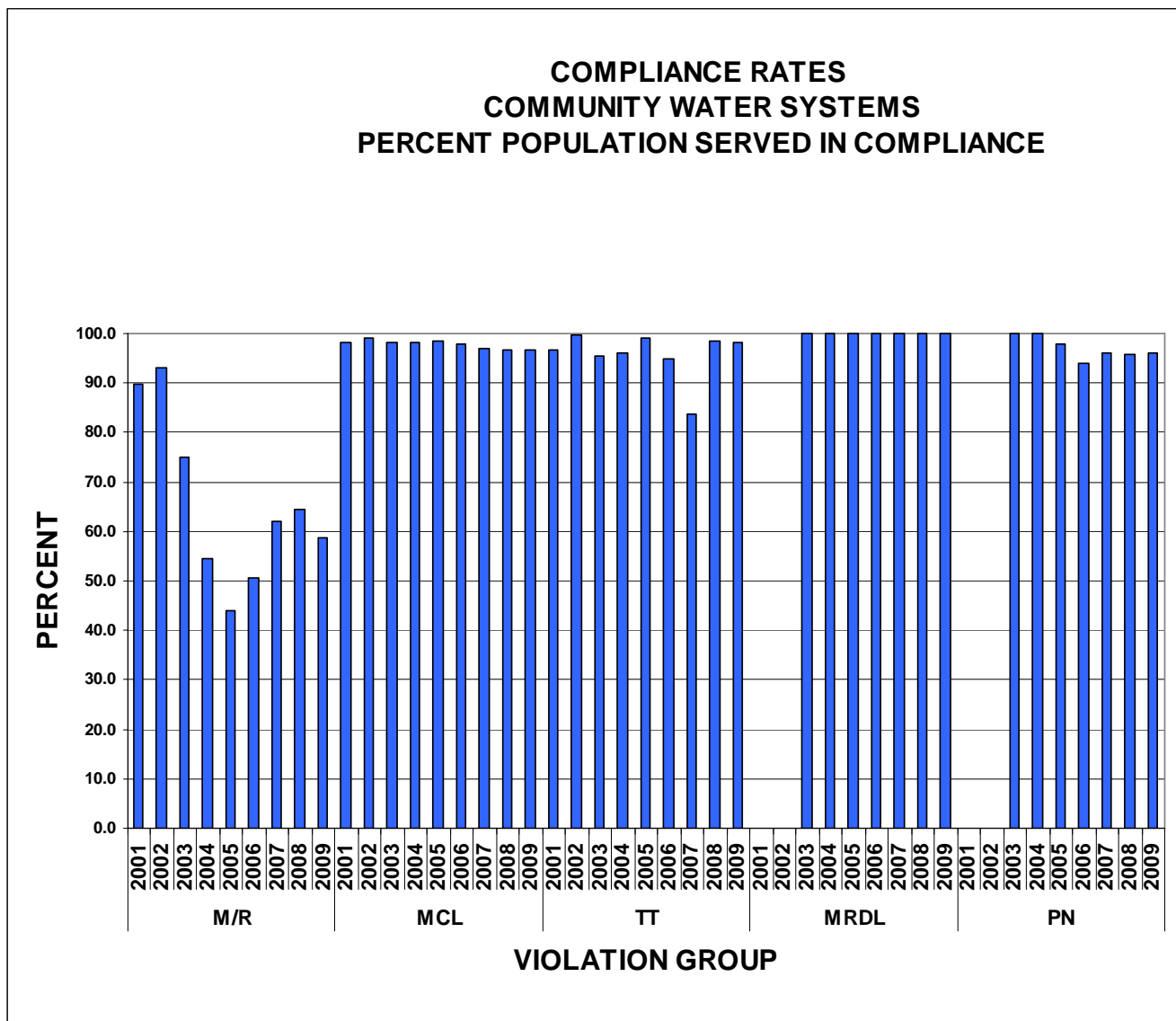


Figure 24. Compliance Trends – Percent of Population Served by Community Water Systems in Compliance



In 2009, public water systems continued to meet the challenges from existing regulations, while also complying with early implementation requirements for the Long Term 2 (LT2) Enhanced Surface Water Treatment Rule, Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR), and the Groundwater Rule (GWR). These early implementation activities included developing and submitting monitoring plans (LT2 and Stage 2), conducting early monitoring for *Cryptosporidium* and/or *E. coli* (LT2), and in some cases, disinfection byproducts (Stage 2), and submitting information to document 4-log inactivation of viruses (GWR).

Water systems continued efforts to assess the potential threats to and protect their infrastructure from acts of terrorism in 2009. DEP implemented several outreach and training events to help water suppliers prevent attacks against their systems. Additionally, DEP maintains a rapid notification system in the event of planned or actual attacks against water systems.

In 2009, DEP staff remained active in numerous areas such as source water protection; training and technical assistance; compliance monitoring; surveillance and outreach. Other efforts, such as Filter Plant Performance Evaluations and the Partnership for Safe Water, were used to optimize the operation of filter plants to consistently and reliably remove disease-causing organisms. DEP continued to build on tools to address water system needs.

As compliance is a long-term effort, DEP staff continue to work with each and every violator to address violations as they occur. In most instances, these efforts result in a voluntary return to compliance. However, when those efforts fail, progressive levels of compliance and enforcement are used.

DEP will continue to develop programs to assist water suppliers in protecting and managing their sources of supply; building technical, managerial, and financial capability; and training and certifying personnel responsible for the day-to-day operations of their drinking water systems. Congress enacted sweeping amendments to the federal Safe Drinking Water Act that will lend considerable support to DEP's efforts. In addition to establishing a state revolving loan fund for water system improvements, Congress established technical and financial assistance programs to states and suppliers for source water protection, capacity development, and training and outreach activities. These tools will enable DEP to assist Pennsylvania's public water systems in delivering a safe and adequate supply of drinking water to their consumers.

Where To Go For Additional Information

Copies of this report, an Appendix listing the public water systems having MCL, MRDL or treatment technique violations during 2009, and additional information about the Pennsylvania Safe Drinking Water Program are available. Please contact DEP at:

Department of Environmental Protection
Bureau of Water Standards and Facility Regulation
P.O. Box 8467, 11th Floor RCSOB
Harrisburg, PA 17105-8467
Phone: 717-787-5017

Web site: <http://www.dep.state.pa.us> Keyword: drinking water