

Pennsylvania Public Water System Compliance Report for 2011

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Pennsylvania Compliance Report for 2011 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 2011. 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 PWS which provides water for bottling in sealed bottles or other sealed containers.

Bulk Water Hauling System: A PWS 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 PWS 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 PWS 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 public water systems 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 public water system 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 administered the PWSS program in 2011. 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 9,300 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-annual 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, malfunctioning septic systems
- 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 22 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 13 unfiltered surface and groundwater under the direct influence of surface water (GUDI) systems remain, while the number of surface and GUDI filtration plants has increased from 204 to 356. Pennsylvanians benefit from the improved public health protection provided by these filtration plants. The Surface Water Treatment Rule has been revised several times to increase public health protection. Most recently the Long-Term 2 Surface Water Treatment Rule (LT2SWTR) is being implemented to increase the public's protection from diseases associated with cryptosporidium and other disease causing microorganisms in drinking water.

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 GUDI) 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.

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. During 2010, the Pennsylvania Department of Health reported two (2) Legionella outbreaks. During 2011, the Pennsylvania Department of Health reported four (4) Legionella outbreaks involving twenty-two (22) people (cases), eleven (11) hospitalizations and one (1) death. The potable water supply was the probable source of the Legionella in all four (4) outbreaks. Three (3) of the outbreaks occurred at long-term care facilities and one (1) at a hotel.

Waterborne disease outbreaks related to non-potable sources such as swimming and bathing facilities are not included in this report.

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. Additionally, 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 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. In recent years, surveillance activities have been expanded to include electronics, craft and auto parts stores that sell solder. 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 2011 Lead Ban Surveillance Project include:

- 230 stores were surveyed; of these, 176 sell solder.
- 175 of the 176 stores sell lead-free solder (79% sell *only* lead free solder);
- 24 stores (13.6%) were in violation of the PA Lead Ban Act;
- 3 (1.7%) were selling banned solder; and
- 21 (11.9%) were selling restricted solder in the plumbing section.

To view the *2011 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_2011.pdf

Monitoring/Reporting Requirements

All public water systems 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 public

water systems, 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 public water system to conduct additional monitoring if DEP has reason to believe that the public water system 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.

Variations and Exemptions

Variations and exemptions to specific requirements under the Safe Drinking Water Act may be granted under certain circumstances. Occasionally, a public water system 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 public water system 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 public water system must come into compliance with the MCL. In 2011, DEP received no new applications for a variance or exemption. There were no variations or exemptions in effect for any Pennsylvania public water systems during the 2011 report period.

Consumer Confidence Reports

To ensure that customers are aware of the quality of the drinking water supplied to them, community water systems are required to prepare an annual Consumer Confidence Report (CCR). The CCR covering calendar year 2010 was due by July 1, 2011. Details about CCR violations may be found in Figure 12 of this report. DEP continues 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 2011, there were 3226 PN violations. Charts and tables in following sections of this report show the PN violation count by the rule violated.

Regulation Development

No new regulations were promulgated in 2011. However, DEP continues to provide training, outreach and compliance assistance for the Stage 2 Disinfectants and Disinfection Byproducts Rule (DBPR), Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), Groundwater Rule (GWR), and Lead and Copper Short Term Revisions Rule (LCRSTR) regulations.

In 2011 DEP continued the efforts to roll-out implementation of these new rules.

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 included both Assessment (List 1) and Screening Survey (List 2) monitoring. All public water systems serving more than 10,000 people, and a representative sample of public water systems serving less than 10,000 people were required to conduct List 1 monitoring for 10 contaminants. All public water systems serving more than 100,000 people, and select public water systems serving less than 100,000 people were required to conduct List 2 monitoring for 15 contaminants. Monitoring was required during a 12-month period from January 2008 – December 2010. In Pennsylvania, 197 public water systems participated in UCMR 2. During 2011, 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 to the 3 systems that did not complete the required monitoring.

2. Public Water System Profile and Compliance Summary

The following pages display some fundamental Pennsylvania public water system statistics, a table of the incidence of MCL, MRDL, TT, and significant monitoring violations, and graphics to illustrate the general picture of public water system compliance in Pennsylvania in 2011.

Data in the federal Safe Drinking Water Information System (SDWIS) may differ from the information in this report. The 2011 report data originates in the Pennsylvania Drinking Water Information System (PADWIS) from a snapshot dated May 21, 2012, 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: 12,742,886
- Percent of Population Served by Individual Wells: 16%
- Percent of Population Served by Community Water Systems: 84%
- 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.
- 78% of the population was covered by source water protection programs
- 97% of all CWS ground water sources have had a Surface Water Identification Protocol (SWIP) evaluation.*
- 4 confirmed waterborne disease outbreaks occurred during 2011.
- 2,103 on-site assessments (full inspections) were performed.
- 99.93% of the population served by CWSs with surface-water sources or ground water under the direct influence of surface water receive filtered water.*
- 73% of all surface water systems have optimized filtration treatment.
- 55 Filter Plant Performance Evaluations were performed during 2011.
- 97 % of the population served by CWSs is protected by optimized corrosion control.*
- 93% of all children at day-care and school facilities that have their own water supply are protected by optimized corrosion control treatment.*
- Over 99.92% of the population served by CWSs are protected from nitrate/nitrite.*
- Over 98% of the population of CWSs are protected from carcinogenic contaminants.*

* Statistics compiled in June 2012

Compliance Action Summary

Action	Number
Compliance Notices and NOV's	6624
Consent & Administrative Orders	170
Consent Assessments	8
Boil Water Advisories (Community Systems)	44
Boil Water Advisories (Noncommunity Systems)	111
Civil Penalties Collected	\$330,597.78

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

PWS Profile

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

	NUMBER OF PWSs			POPULATION SERVED		
	CWS	NTNC	TNC	CWS	NTNC	TNC
SMALL	1,708	1,087	5,898	933,259	389,901	739,049
MEDIUM	296	12	6	3,657,473	68,584	26,100
LARGE	33	0	0	6,137,291	0	0
TOTAL	2,037	1,099	5,904	10,728,023	458,485	765,149

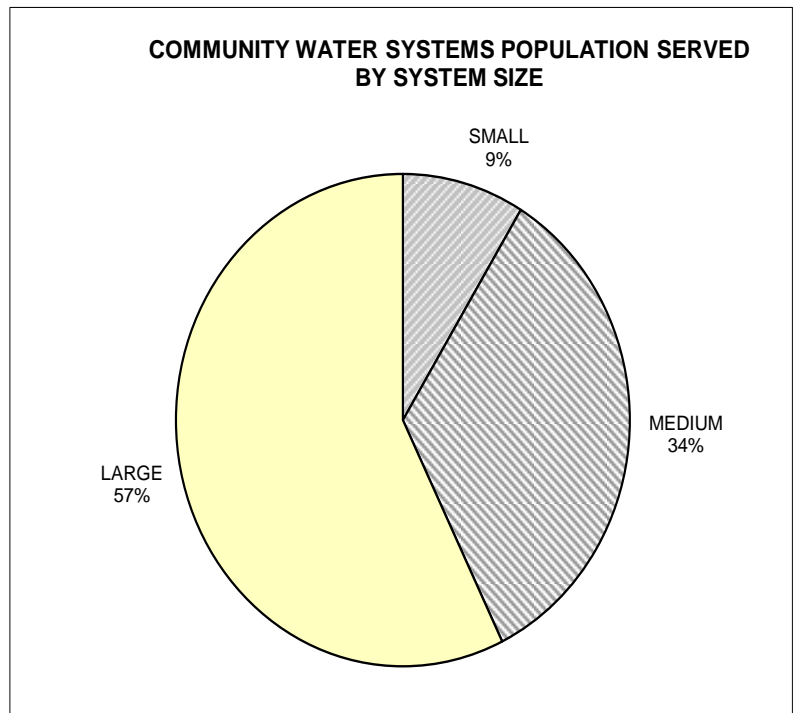
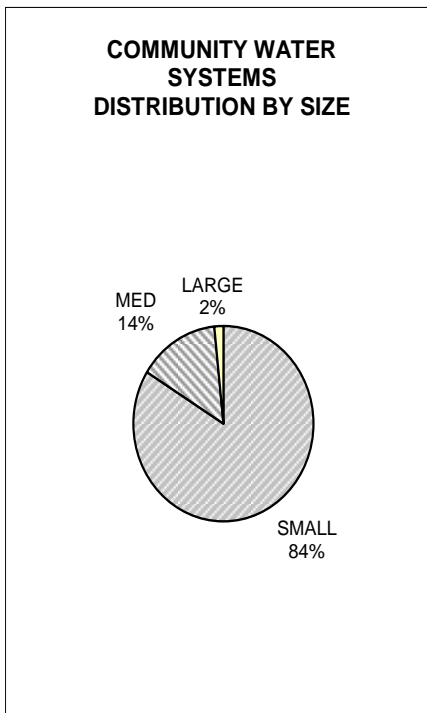


Figure 2. PWSs by Source and System Type

	CWS		NTNC		TNC		TOTAL	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
GROUND	1,570	77.1%	1,081	98.4%	5,836	98.8%	8,487	93.9%
SURFACE	467	22.9%	18	1.6%	68	1.2%	553	6.1%
TOTAL	2,037	100.0%	1,099	100.0%	5,904	100.0%	9,040	100.0%

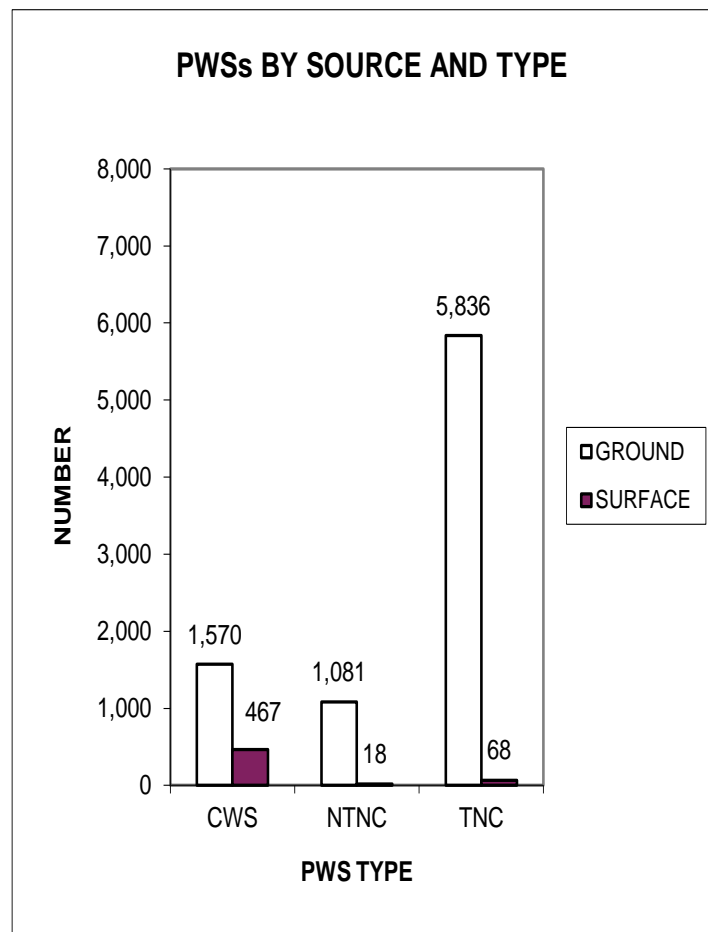
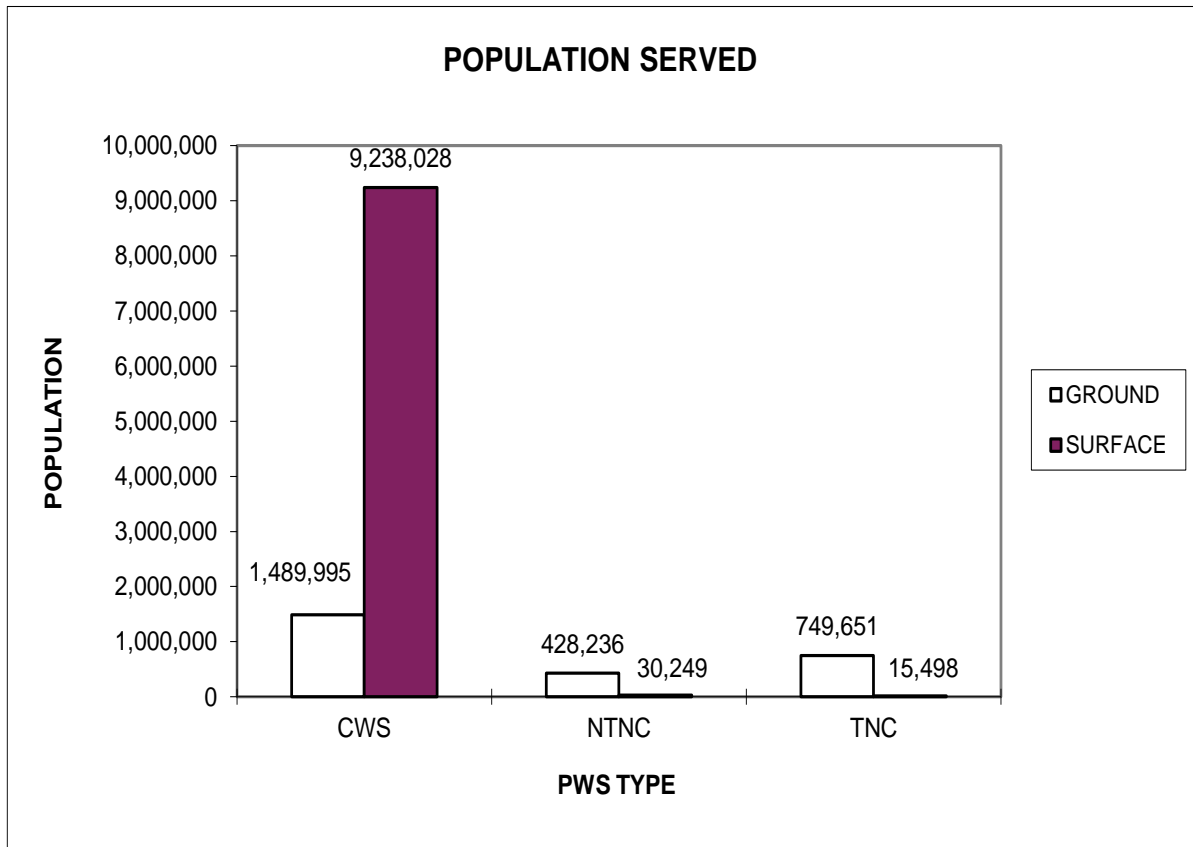


Figure 3. Population Served by Source Type

POP SERVED BY SOURCE AND SYSTEM TYPE								
	CWS		NTNC		TNC		TOTAL	
	POPL SERVED	PER CENT	POPL SERVED	PER CENT	POPL SERVED	PER CENT	POPL SERVED	PER CENT
GROUND	1,489,995	13.9%	428,236	93.4%	749,651	98.0%	2,667,882	22.3%
SURFACE	9,238,028	86.1%	30,249	6.6%	15,498	2.0%	9,283,775	77.7%
TOTAL	10,728,023	100.0%	458,485	100.0%	765,149	100.0%	11,951,657	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 are for late or missing reports, incomplete reports and missing certification forms. [40 CFR 141.151]

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

Ground Water Rule (GWR): The GWR provides increased protection against microbial pathogens, specifically viral and bacterial pathogens, in public water systems that use ground water sources. The 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. [40 CFR 141.400]

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 that exceeded the lead action level 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].

Public Notification Rule: The PN Rule establishes criteria under which public water systems must issue notification to all consumers about violations that have occurred. The rule specifies specific content and delivery requirements and deadlines. PN violations occur when the public water system fails to issue a notice, the notice is incomplete or the certification that the notice was delivered is not submitted.

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.

Stage 1 Disinfectants and Disinfection Byproducts Rule (DBPR): 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 Stage 1 DBPR are reported for the following categories: M/R, MCL and MRDL.

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. The rule was further amended in 2006 to include the Long Term 2 Enhanced SWTR requirements to increase the public’s protection from diseases associated with cryptosporidium and other disease causing microorganisms in drinking water. 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 treatment 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]. Pennsylvania requires all water systems with surface water sources to install filtration.

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, 2011 to December 31, 2011**

	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	147	111
1,1,2-Trichloroethane	0.005	0	0	147	111
1,1-Dichloroethylene	0.007	0	0	147	111
1,2-Dichloroethane	0.005	0	0	148	112
1,2-Dichloropropane	0.005	0	0	147	111
1,2 Dibromo-3-Chloropropane (DBCP)	0.0002	0	0	306	154
1,2,4-Trichlorobenzene	0.07	0	0	147	111
2,3,7,8-TCDD (Dioxin)	3X10 ⁻⁸	0	0	382	196
2,4,5-TP (Silvex)	0.05	0	0	330	169
2,4-D	0.07	0	0	350	183
Alachlor (Lasso)	0.002	0	0	300	154
Atrazine	0.003	0	0	315	171
Benzene	0.005	0	0	147	111
Benzo (A) Pyrene	0.0002	0	0	304	158
BHC-gamma (Lindane)	0.0002	0	0	300	153
Carbofuran	0.04	0	0	352	180
Carbon Tetrachloride	0.005	0	0	147	111
Chlordane	0.002	0	0	309	153
cis-1,2-Dichloroethylene	0.07	0	0	147	111
Dalapon	0.2	0	0	328	167
Di(2-Ethylhexyl) Adipate	0.4	0	0	304	158
Di(2-Ethylhexyl) Phthalate	0.006	4	1	314	164
Dichloromethane (Methylene Chloride)	0.005	2	1	149	113
Dinoseb	0.007	0	0	330	169
Diquat	0.02	0	0	299	152
Endothall	0.1	0	0	318	161
Endrin	0.002	0	0	285	146
Ethylbenzene	0.7	0	0	150	114
Ethylene Dibromide (EDB)	0.00005	0	0	308	155
Glyphosate	0.7	0	0	331	168

	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
Heptachlor	0.0004	0	0	282	144
Heptachlor Epoxide	0.0002	0	0	287	145
Hexachlorobenzene (HCB)	0.001	0	0	283	145
Hexachlorocyclopentadiene	0.05	0	0	294	148
Methoxychlor	0.04	0	0	302	157
Monochlorobenzene (Chlorobenzene)	0.1	0	0	147	111
o-Dichlorobenzene	0.6	0	0	147	111
Oxamyl (Vydate)	0.2	0	0	352	179
p-Dichlorobenzene	0.075	0	0	147	111
Pentachlorophenol	0.001	0	0	343	171
Picloram	0.5	0	0	349	178
Simazine	0.004	0	0	318	167
Styrene	0.1	0	0	146	110
Tetrachloroethylene	0.005	0	0	147	111
Toluene	1	0	0	147	111
Total Polychlorinated Biphenyls (PCBS)	0.0005	0	0	336	167
Toxaphene	0.003	0	0	302	153
trans-1,2-Dichloroethylene	0.1	0	0	147	111
Trichloroethylene	0.005	5	3	147	111
Vinyl Chloride	0.002	0	0	0	0
Xylenes, Total	10	0	0	147	111
Subtotal		11	5	12458	414
INORGANIC CONTAMINANTS					
Antimony, Total	0.006	0	0	21	19
Arsenic	0.010	22	9	29	24
Barium	2	3	1	21	19
Beryllium, Total	0.004	0	0	21	19
Cadmium	0.005	0	0	22	20
Chromium	0.1	0	0	20	18
Cyanide	0.2	0	0	18	16
Fluoride	2	2	1	24	22
Mercury	0.002	0	0	21	19
Nickel	0.1	0	0	21	19
Nitrate	10 (as Nitrogen)	55	38	578	480

	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	575	477
Selenium	0.05	0	0	21	19
Thallium, Total	0.002	0	0	22	20
Subtotal		82	49	1414	524
RADIONUCLIDE CONTAMINANTS					
Radium 226	-----	0	0	59	36
Radium 228	-----	0	0	60	37
Combined Radium (-226 & -228)	5 pCi/L	7	3	0	0
Combined Uranium	30 µg/L	0	0	73	40
Gross Alpha, Excl. Radon & U	15 pCi/L	2	1	47	27
Gross Beta & Photo Emitters	4 mrem/yr	0	0	1	1
38-Strontium-90	8 pCi/L	0	0	0	0
Tritium	20,000 pCi/L	0	0	0	0
Subtotal		9	4	240	48
TOTAL CHEMICAL CONTAMINANTS		102	58	14,112	986
TOTAL COLIFORM RULE					
MCL, Acute	Present	77	74		
MCL, Monthly	Present	608	437		
Monitoring Routine & Repeat Major				1,613	1,195
Subtotal		685	443	1613	1,195

Figure 5A.

Pennsylvania—SUMMARY OF VIOLATIONS
Surface Water Treatment/IESWTR/LT2SWTR and Lead and Copper Rules
Treatment Techniques (TT) and TT Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2011 to December 31, 2011

	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/LT2SWTR				
Filtered systems				
Monitoring, routine/repeat			174	50
Treatment techniques	7	4		
Unfiltered systems				
Monitoring, routine/repeat			56	12
Treatment techniques	0	0		
Subtotal	7	4	230	62
LEAD AND COPPER RULE				
Initial lead and copper tap M/R			18	16
Follow-up or routine lead and copper tap M/R			161	159
Treatment installation/technique	19	17		
Subtotal	19	17	179	175

Figure 5B.

**Pennsylvania—SUMMARY OF VIOLATIONS
Ground Water Rule
Treatment Techniques (TT) and TT Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2011 to December 31, 2011**

	Treatment Technique Violations		Significant Monitoring/Reporting Violations	
	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
GROUNDWATER RULE	61	35	500	176

Figure 5C.

**Pennsylvania—SUMMARY OF VIOLATIONS
Disinfectants and Disinfection Byproducts
MCL, MRDL, TT and MCL, MRDL, TT Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2011 to December 31, 2011**

	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	2	1	5	4
Chloramine	4.0	TT	1	1	0	0
Chlorine	4.0	TT	5	5	1453	596
Chlorine Dioxide	0.8	MR	0	0	0	0
Chlorite	1.0	MR	0	0	3	1
Total Alkalinity		MR	0	0	57	24
Total Organic Carbon		TT	44	21	51	25
Haloacetic Acids (Five)	0.06	MCL	42	20	97	87
Trihalomethanes	0.08	MCL	71	30	82	73
Subtotal			165	78	1748	810

Figure 6.

**Pennsylvania—SUMMARY OF VIOLATIONS
MCL, MRDL, Treatment Technique, PN, and Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2011 to December 31, 2011**

	Number of Violations	Number Of Systems
GRAND TOTAL	22,668	3,012

NOTE: Grand totals include 157 consumer confidence reporting violations involving 157 community water systems and 3226 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	233	55	101
MEDIUM	7	13	3
LARGE	0	1	0
TOTAL	240	69	104

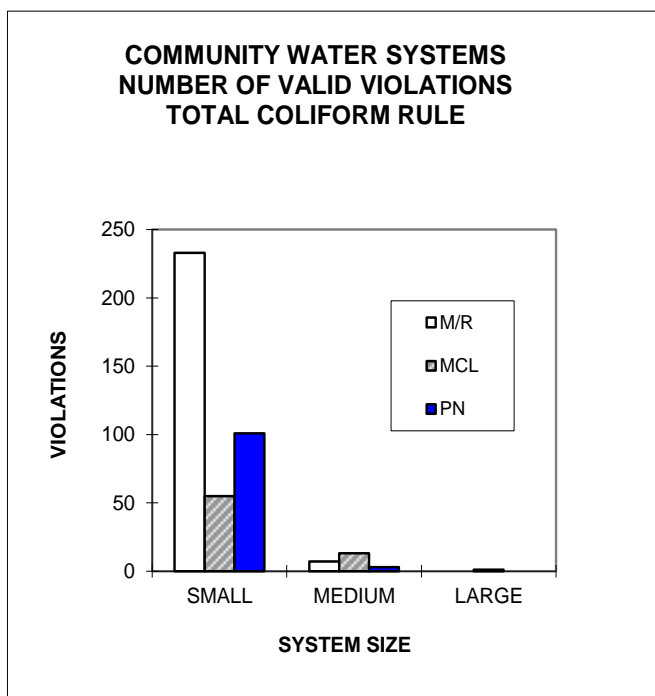


Figure 8.

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

	M/R	MCL	PN
SMALL	6,264	25	0
MEDIUM	2,422	2	0
LARGE	89	0	0
TOTAL	8,775	27	0

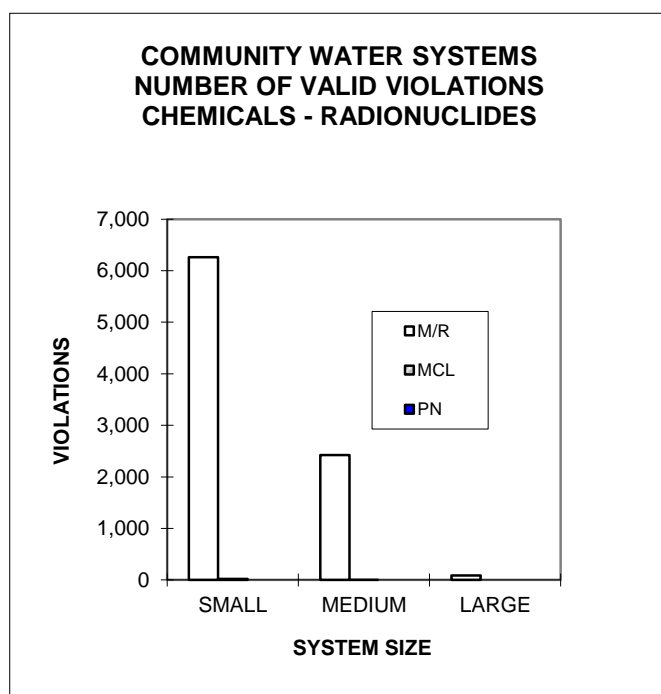


Figure 9.

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

	M/R	TT	PN
SMALL	120	0	14
MEDIUM	27	3	4
LARGE	0	0	0
TOTAL	147	3	18

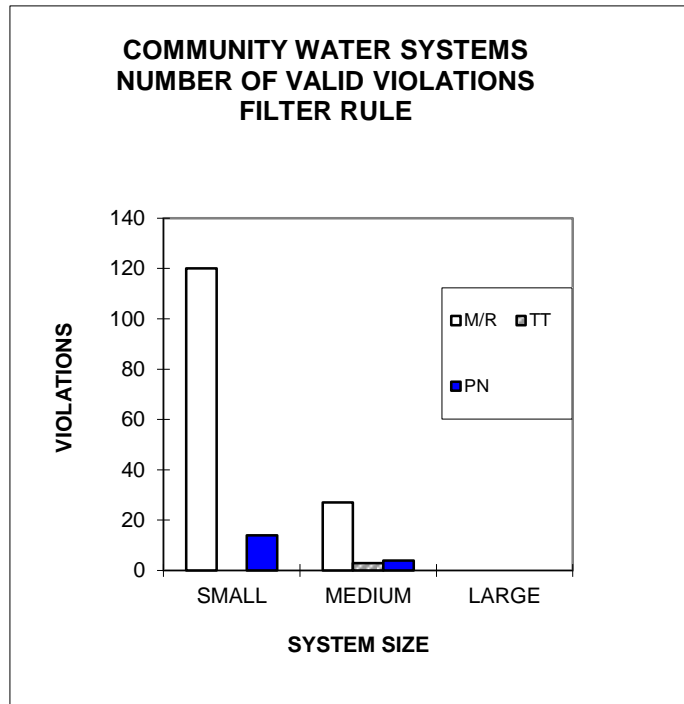


Figure 10.

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

	M/R	TT	PN
SMALL	79	4	10
MEDIUM	8	0	0
LARGE	0	0	0
TOTAL	87	4	10

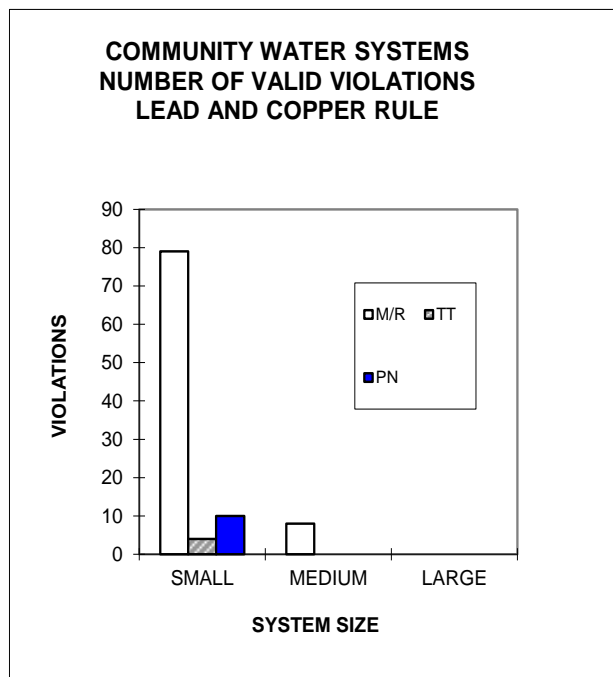


Figure 11.

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

	M/R	TT	PN
SMALL	287	26	30
MEDIUM	133	32	20
TOTAL	420	58	50

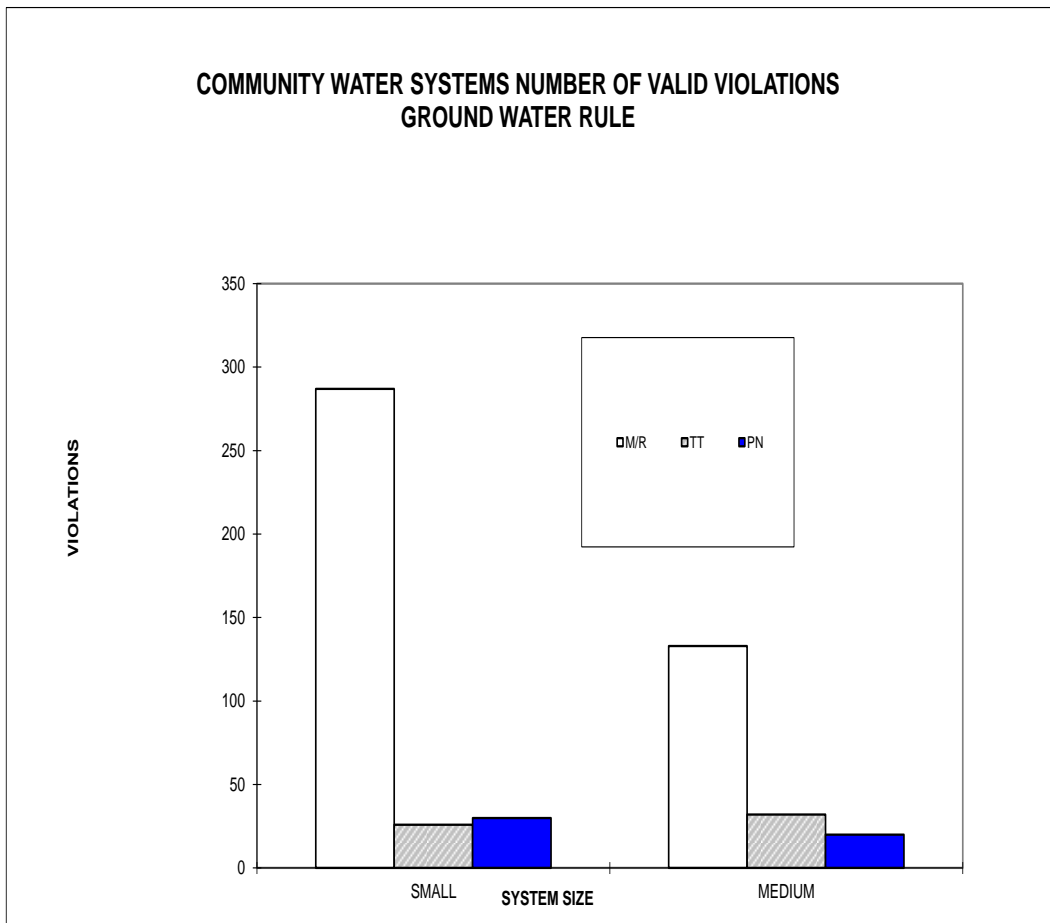


Figure 12.

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

	M/R	MCL	MRDL	T/T	PN
SMALL	1,261	83	0	31	258
MEDIUM	185	14	0	12	51
LARGE	2	2	0	0	3
TOTAL	1,448	99	0	43	312

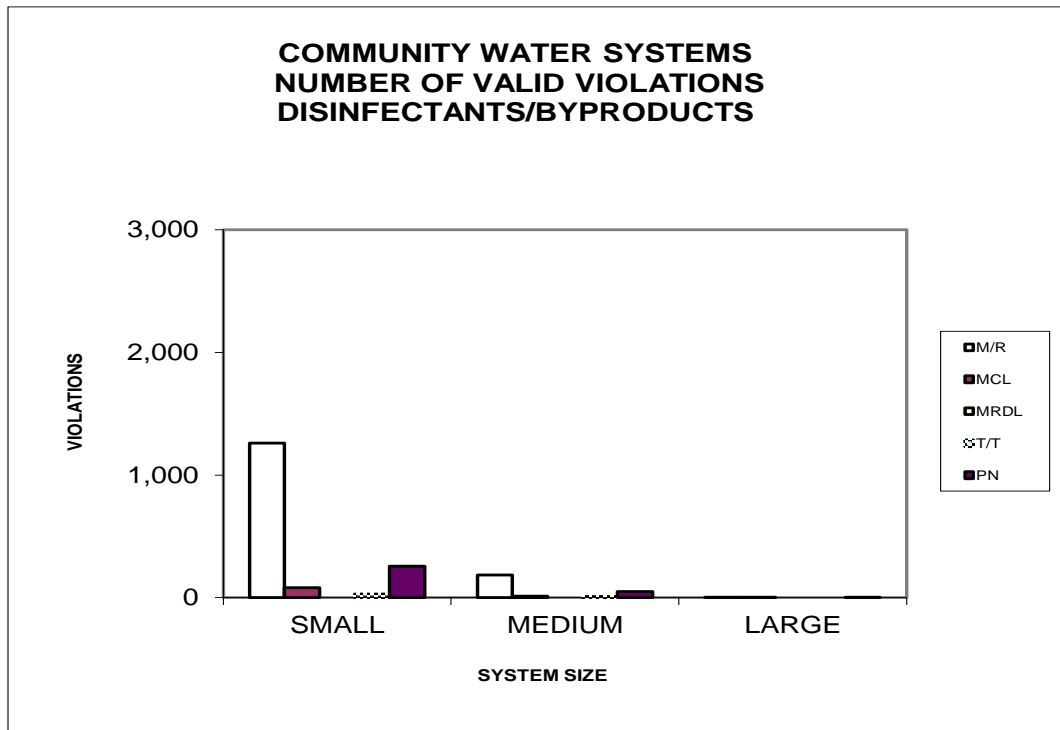


Figure 13.

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

	M/R
SMALL	148
MEDIUM	9
LARGE	0
TOTAL	157

Violations for missing reports.

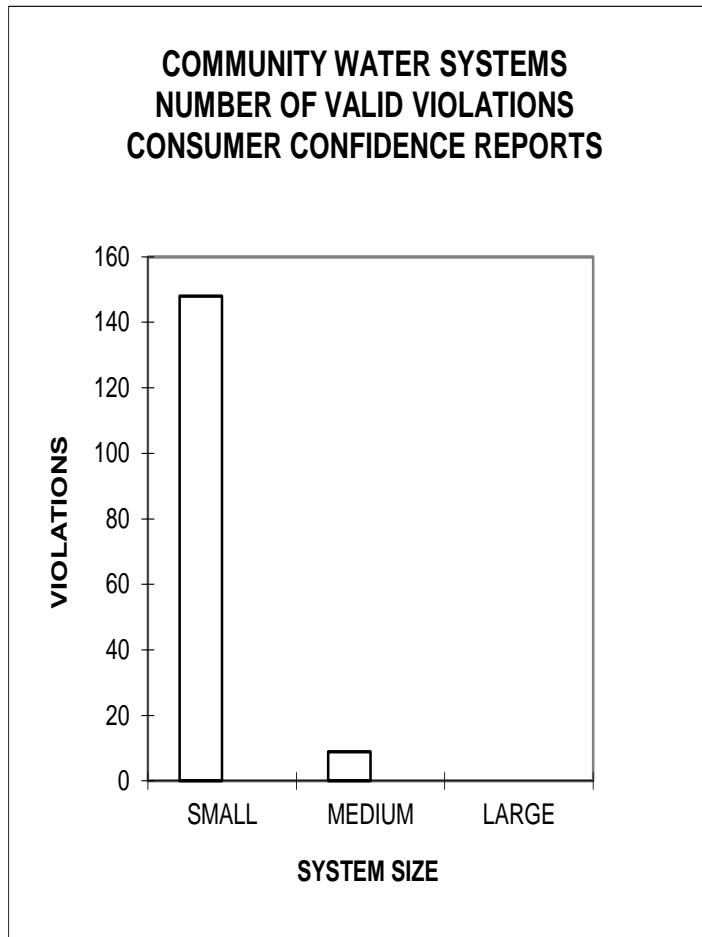


Figure 14.

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

	M/R	MCL	MRDL	TT	PN
TCR	103	73	0	0	43
CHEM/RAD	4,197	31	0	0	278
GWR	9	0	0	1	3
FILTER	17	0	0	3	1
LCR	92	0	0	15	19
DBPR	252	4	0	6	19
TOTAL	4,670	108	0	25	363

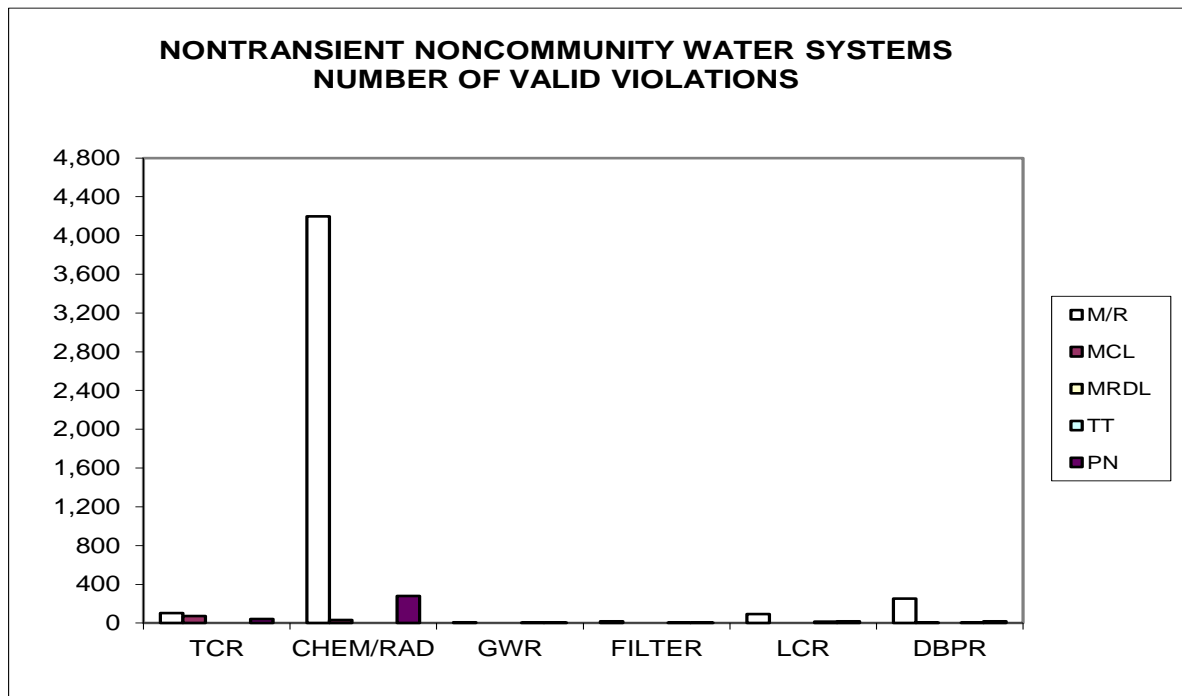
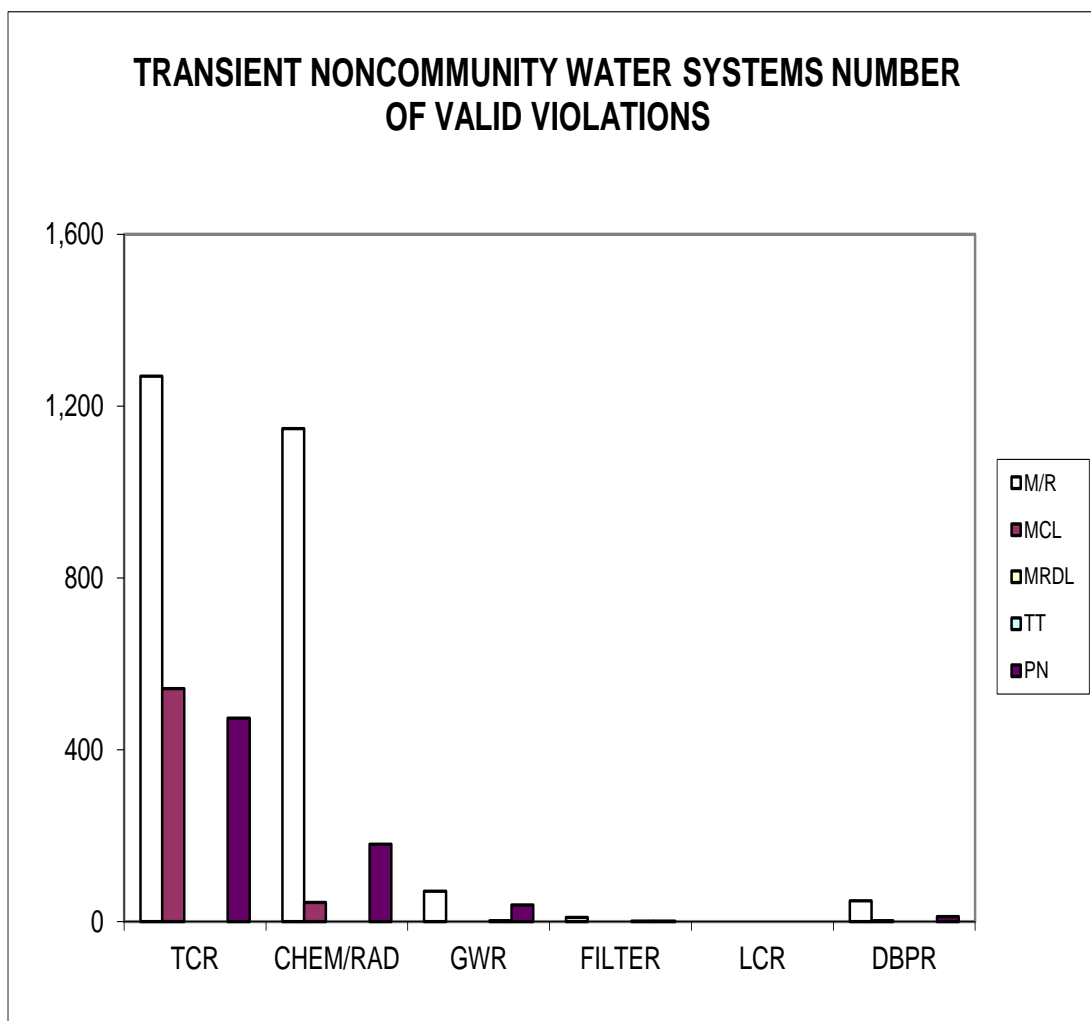


Figure 15.

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

	M/R	MCL	MRDL	TT	PN
TCR	1,270	542	0	0	473
CHEM/RAD	1,148	44	0	0	180
GWR	71	0	0	2	39
FILTER	10	0	0	1	1
LCR	0	0	0	0	0
DBPR	48	2	0	0	11
TOTAL	2,547	588	0	3	704



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 16.

COMMUNITY WATER SYSTEMS PERCENT IN COMPLIANCE FOR MONITORING and REPORTING

	SYSTEMS	POPULATION
SMALL	54.7%	47.4%
MEDIUM	51.7%	57.5%
LARGE	78.8%	74.0%

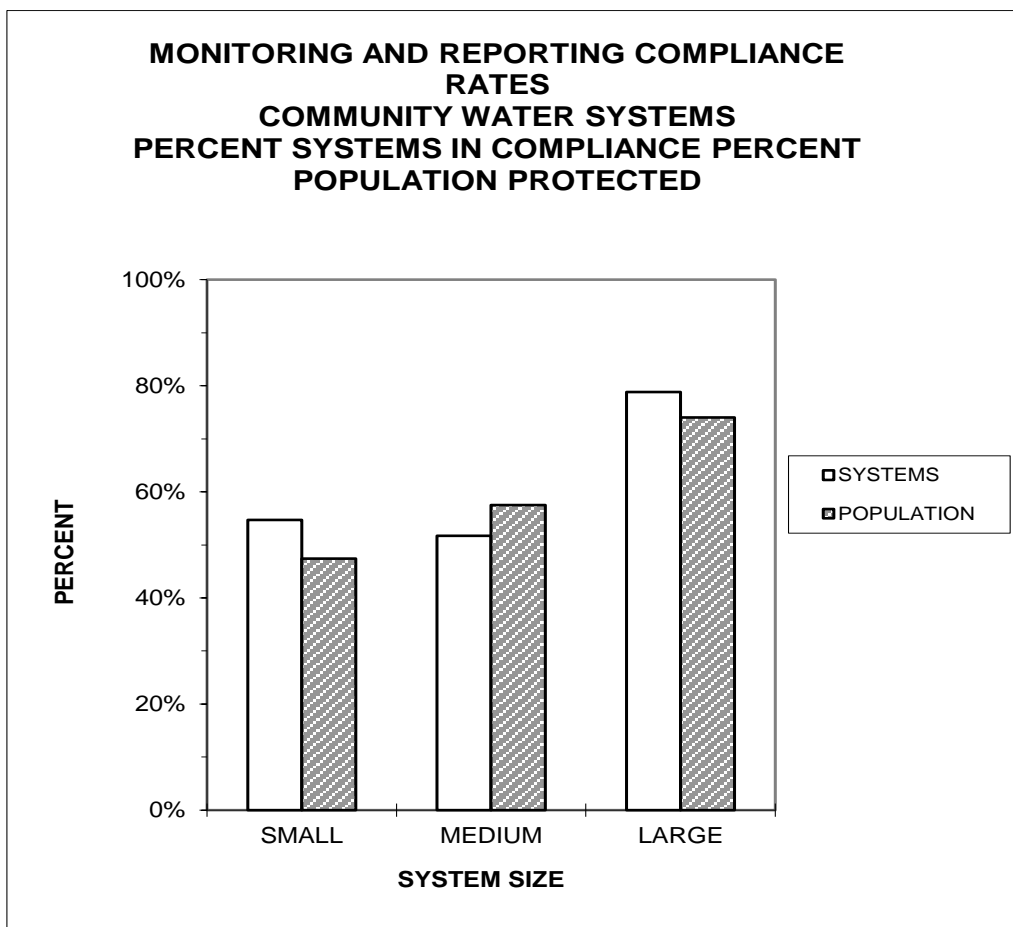


Figure 17.

COMMUNITY WATER SYSTEMS PERCENT IN COMPLIANCE FOR MAXIMUM CONTAMINANT LEVELS

	SYSTEMS POPULATION	
SMALL	95.3%	92.4%
MEDIUM	93.9%	95.2%
LARGE	93.9%	86.1%

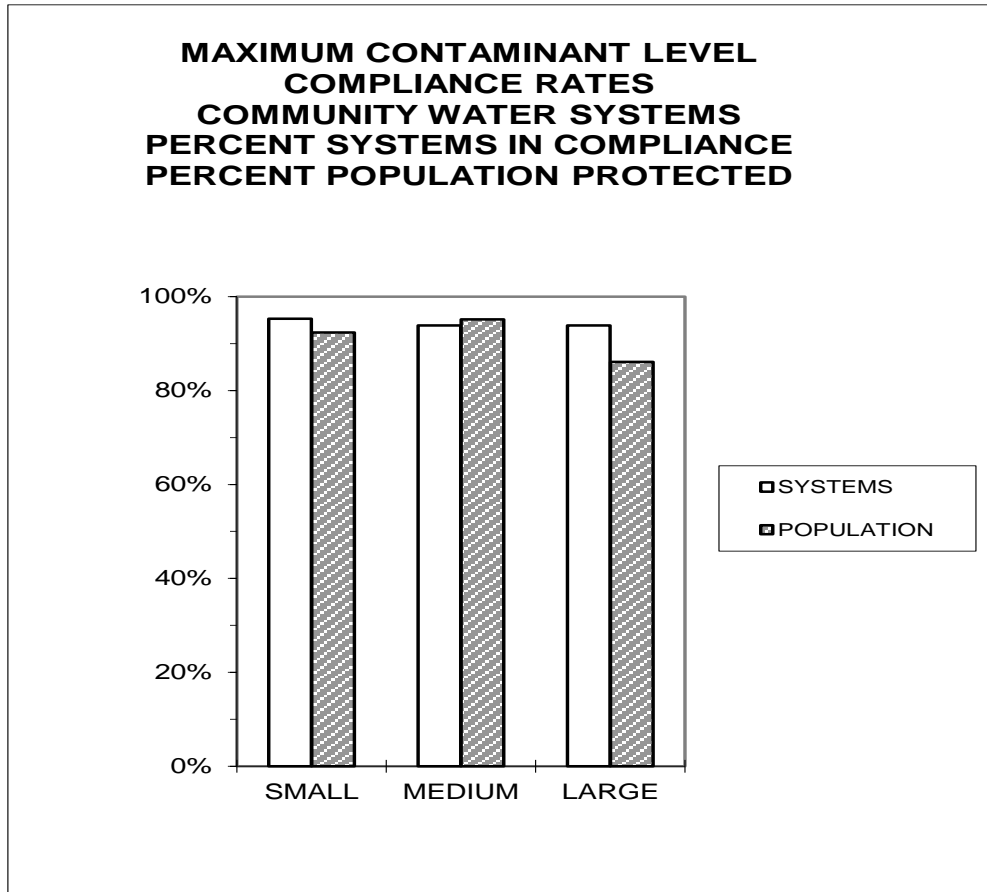


Figure 18.

COMMUNITY WATER SYSTEMS PERCENT IN COMPLIANCE FOR TREATMENT TECHNIQUES

	SYSTEMS	POPULATION
SMALL	97.6%	94.3%
MEDIUM	92.9%	92.4%
LARGE	100.0%	100.0%

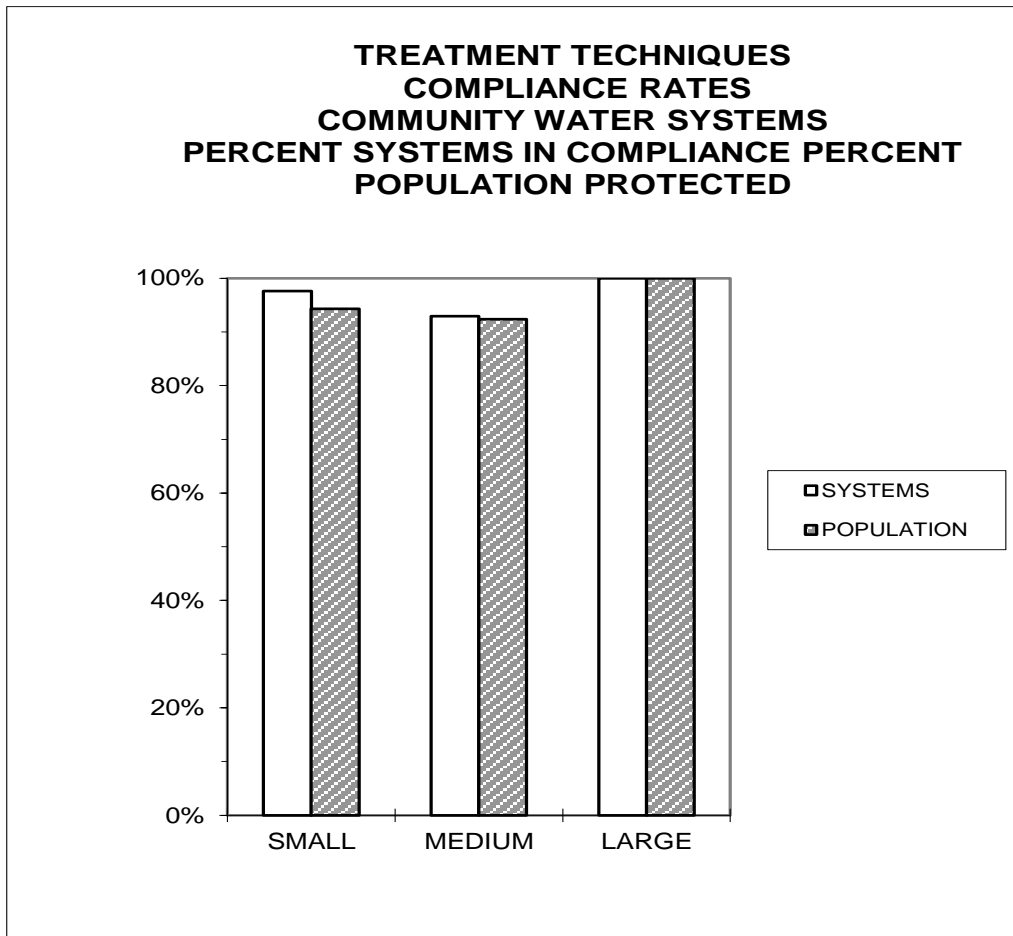


Figure 19.

**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%

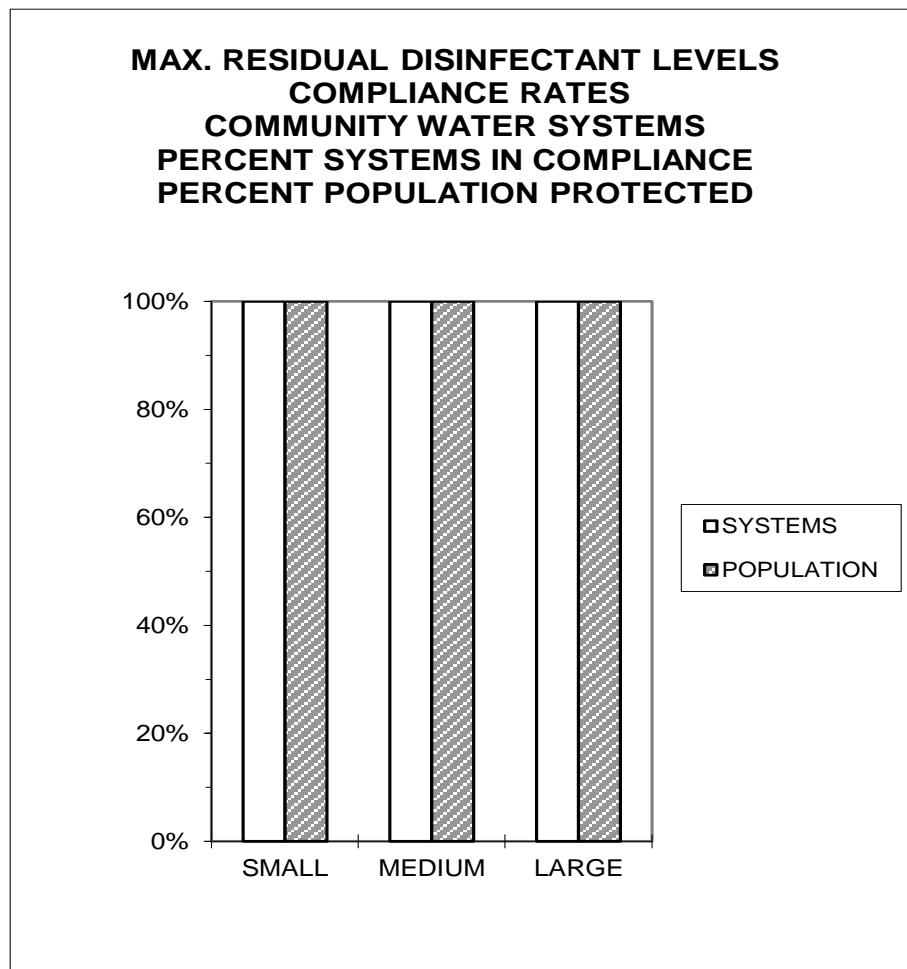


Figure 20.

**NONTRANSIENT NONCOMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE**

	SYSTEMS POPULATION	
M/R	69.5%	55.8%
MCL	94.6%	96.5%
MRDL	100.0%	100.0%
TT	98.5%	99.1%
PN	93.1%	93.1%

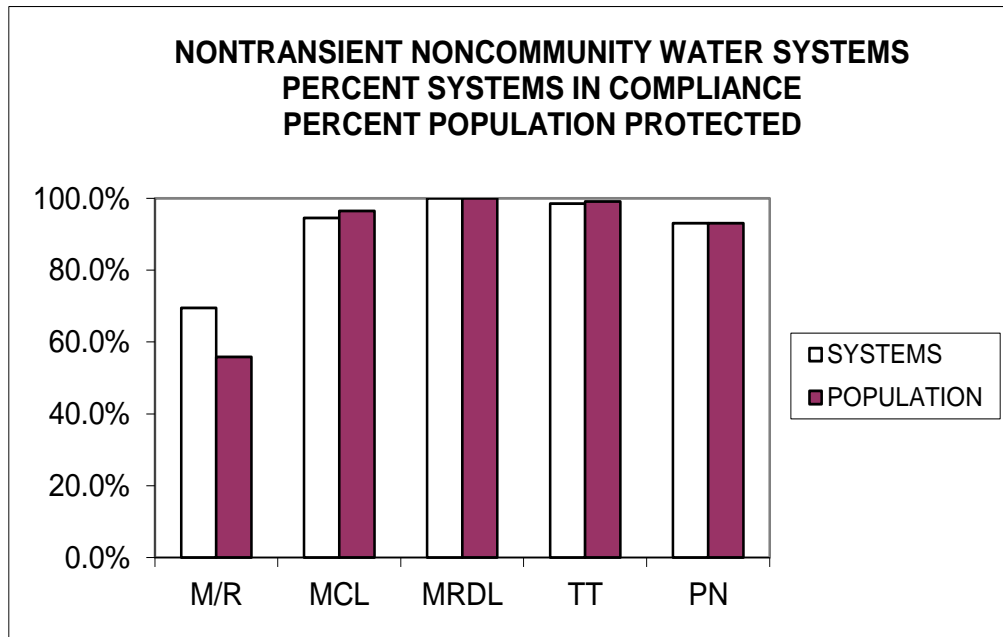


Figure 21.

**TRANSIENT NONCOMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE**

	SYSTEMS POPULATION	
M/R	81.5%	82.1%
MCL	94.1%	94.8%
MRDL	100.0%	100.0%
TT	99.9%	100.0%
PN	93.2%	92.1%

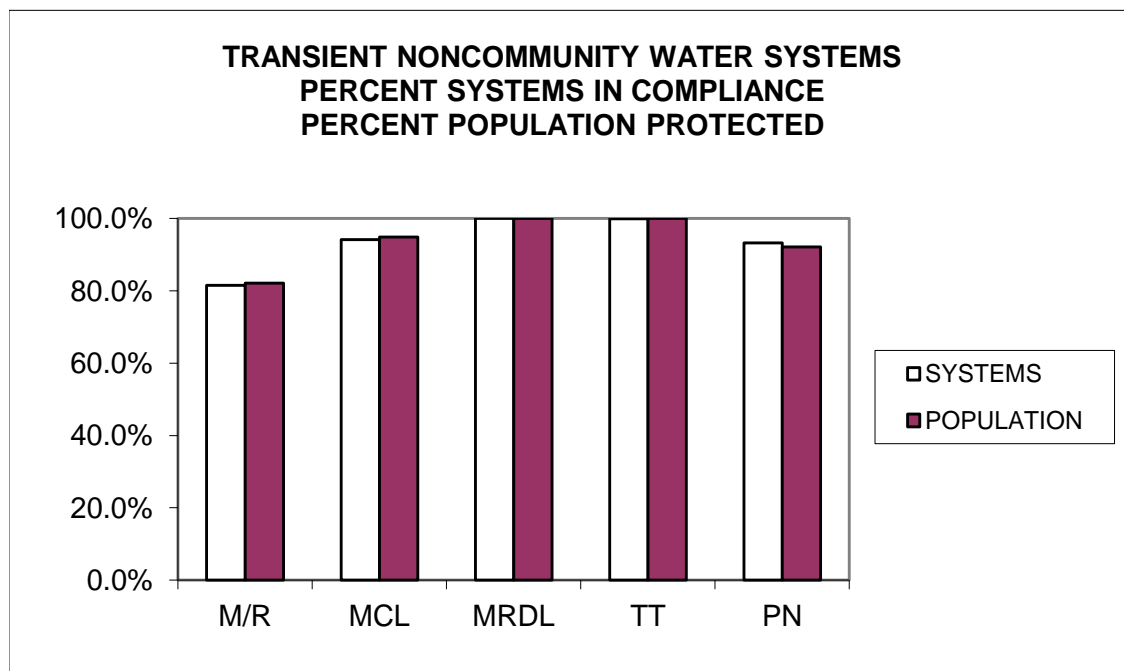


Figure 22.

**ALL PUBLIC WATER SYSTEMS
PERCENT IN COMPLIANCE**

	SYSTEMS	POPULATION
M/R	74.0%	66.7%
MCL	94.4%	90.4%
MRDL	100.0%	100.0%
TT	99.1%	97.2%
PN	92.8%	95.9%

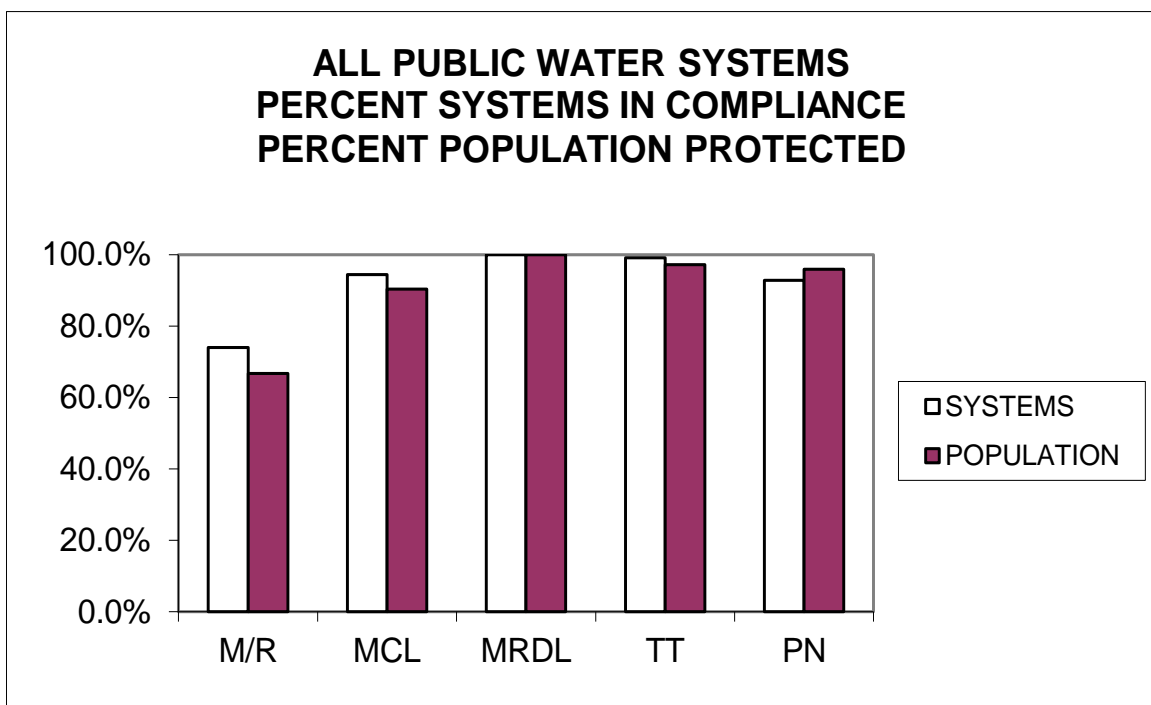
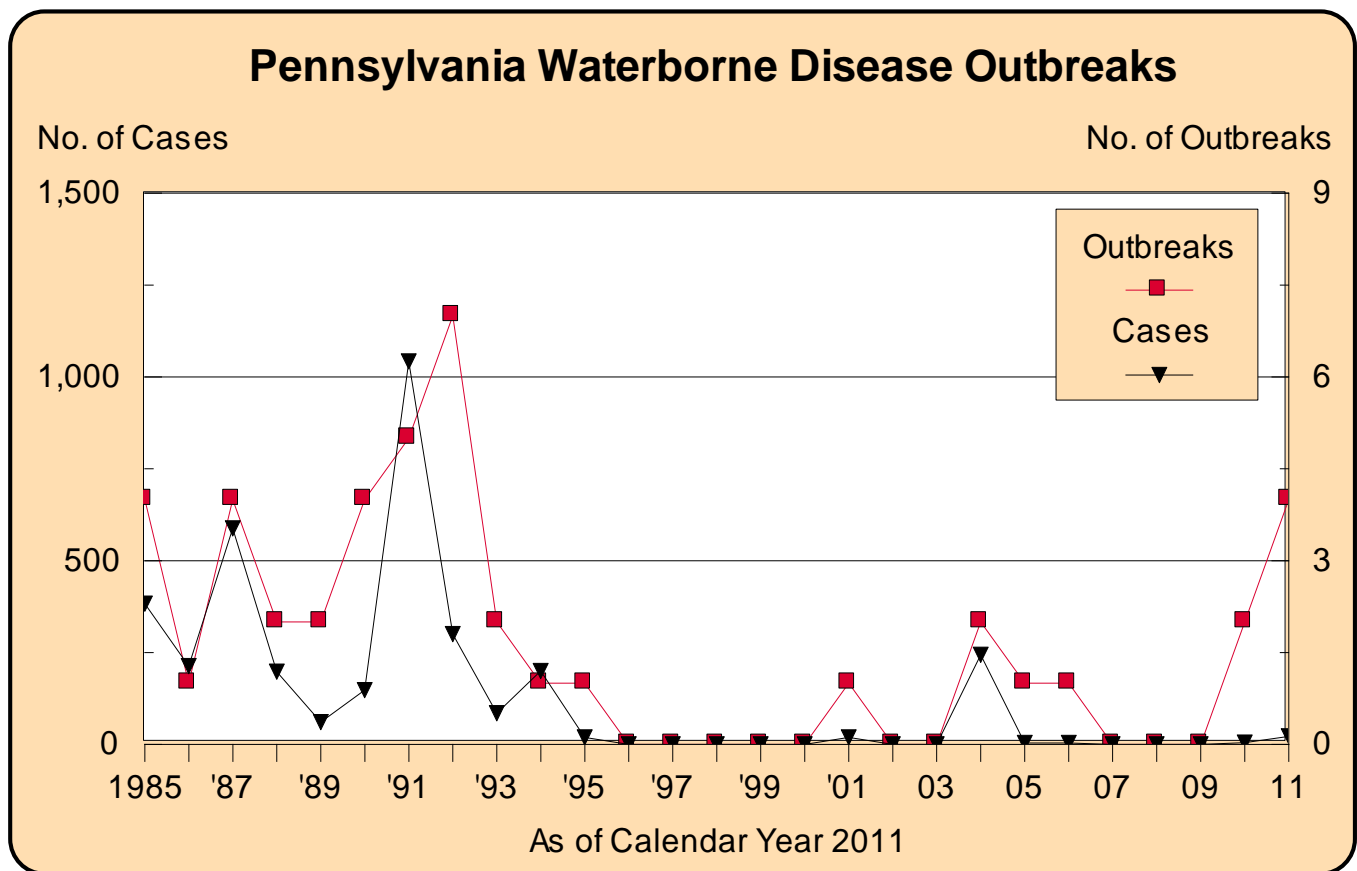


Figure 23.

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. During 2010, the Pennsylvania Department of Health reported two (2) Legionella outbreaks involving five (5) elderly people (cases) During 2011, the Pennsylvania Department of Health reported four (4) Legionella outbreaks involving twenty two (22) people (cases), 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 an overall declining trend in the number of people (cases) affected by waterborne disease outbreaks. However, there has been a slight increase during the last two (2) years due to the fact that the Center for Disease Control and Prevention (CDC) recently determined that Legionella should be reported as a waterborne disease. Legionella outbreaks likely occurred prior to 2010, although public water supplies were not reported as being the probably source. Other factors contributing to the recent increase in cases might include a true increase in disease transmission, greater use of diagnostic testing, and/or increased reporting.



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. Six of these regulations were promulgated in 2009. As a result, public health standards have become more protective. However, the cumulative effect 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 2011, 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 2011, 74% of all public water systems were in compliance with monitoring and reporting requirements, and over 94% of all public water systems were in compliance with the health-based standards. Refer to Figure 24 and 25 for more details about compliance trends.

Figure 24. Compliance Trends – Percent of All Public Water Systems in Compliance

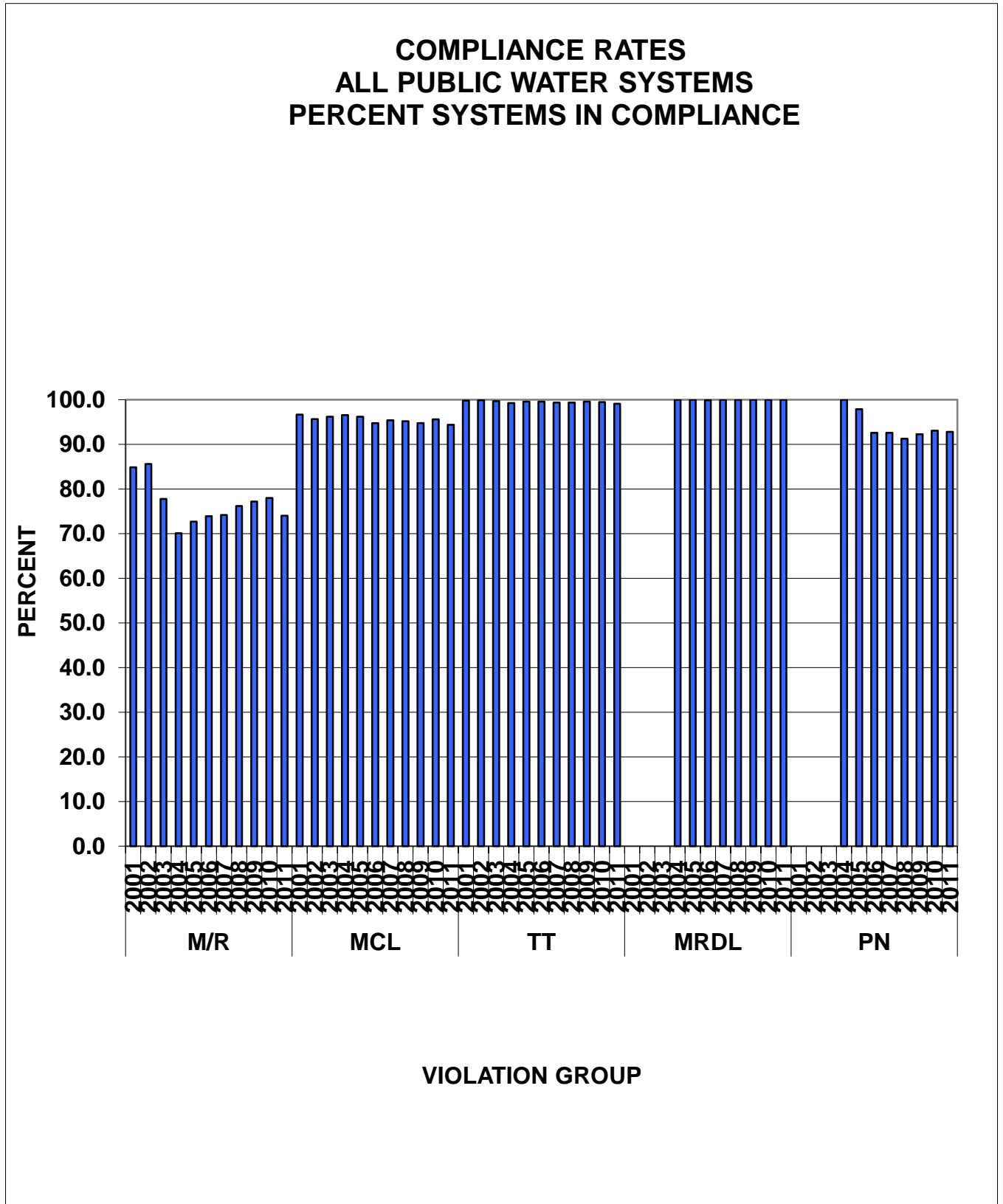
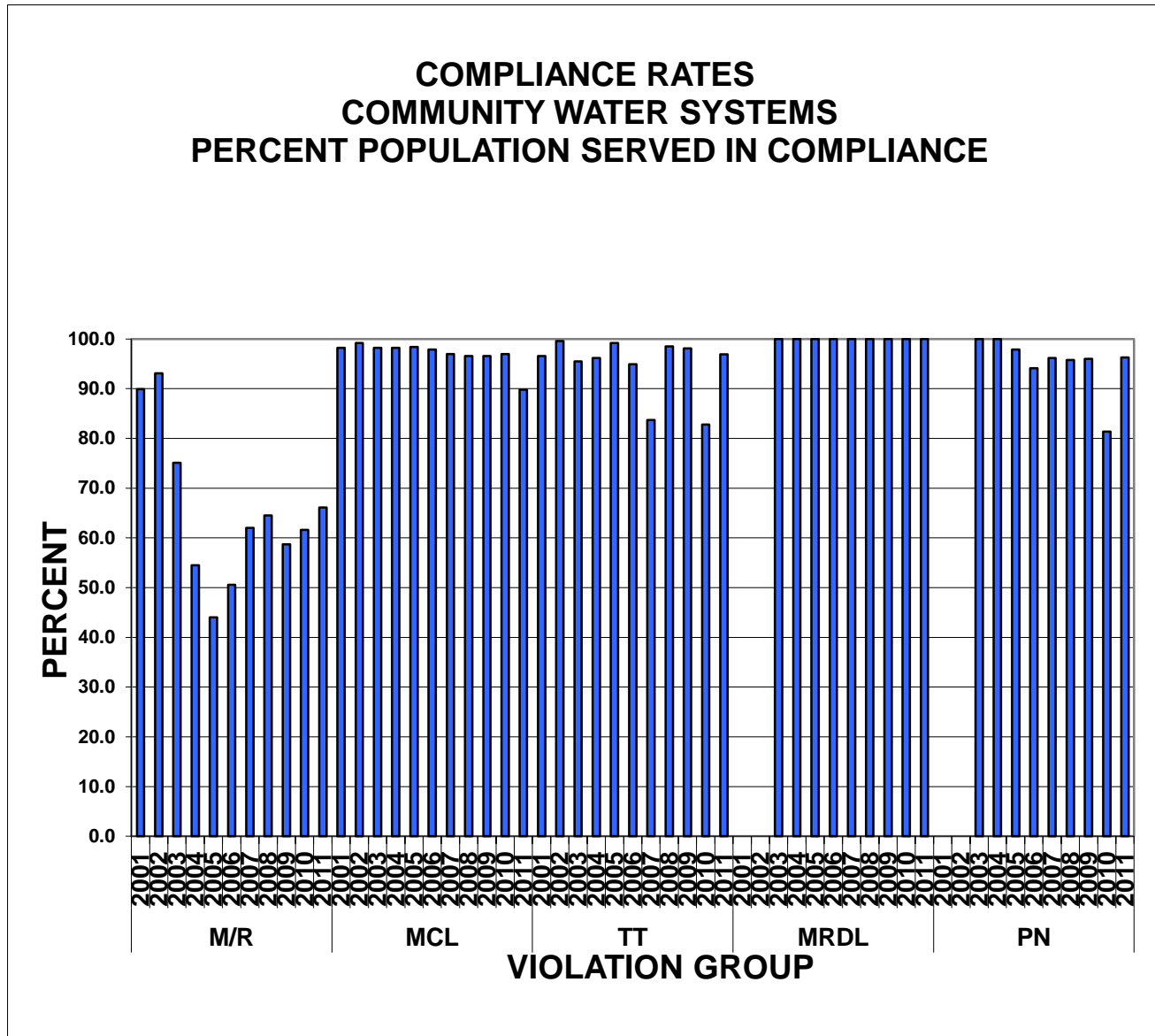


Figure 25. Compliance Trends – Percent of Population Served by Community Water Systems in Compliance



In 2011, 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. col* (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 2011. 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 2011, 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 2011, and additional information about the Pennsylvania Safe Drinking Water Program are available. Please contact DEP at:

Department of Environmental Protection
Bureau of Safe Drinking Water
P.O. Box 8467, 10th Floor RCSOB
Harrisburg, PA 17105-8467
Phone: 717-772-4018

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