

# **OHIO's PUBLIC WATER SYSTEMS**

## **ANNUAL COMPLIANCE REPORT**

**For**

**CALENDAR YEAR 2004**

**Ohio Environmental Protection Agency  
Division of Drinking and Ground Waters  
July 1, 2005**

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## Introduction

The 1996 Amendments to the Safe Drinking Water Act require each State to prepare an Annual Compliance Report summarizing violations incurred by public water systems. The Annual Compliance Report is to be compiled by the State and submitted to U.S. EPA and made available to the public. This report summarizes compliance rates and the number and types of violations generated as a result of various public water systems failing to meet certain Safe Drinking Water Act requirements for calendar year 2004.

Ohio's 2004 Annual Compliance Report contains an overview of the Public Water System Supervision Program in Ohio; provides summary information on the number, types and population served for public water systems; explains the requirements of the Annual Compliance Report; defines the primary categories for which violation information is summarized; a summary table of the number and types of violations; an analysis of public water system compliance with the regulations; and a list of public water system violations for the maximum contaminant level and treatment technique categories.

### **The Drinking Water Program: An Overview**

U.S. EPA established the Public Water System Supervision (PWSS) Program under the authority of the 1974 Safe Drinking Water Act (SDWA). Under the SDWA and the 1986 and 1996 Amendments, U.S. EPA sets national limits on contaminant levels in drinking water to ensure that the water is safe for human consumption. These limits are known as Maximum Contaminant Levels (MCLs). For some regulations, U.S. EPA establishes treatment techniques in lieu of an MCL to control unacceptable levels of contaminants in water by measuring the level of treatment. The Agency also regulates how often public water systems (PWSs) monitor their water for contaminants and report the monitoring results to the States or U.S. EPA. Generally, the larger the population served by a water system, the more frequent the monitoring and reporting (M/R) requirements. However, the M/R requirements vary dependent on which contaminant is being evaluated and the source water used by a system (surface water systems and systems that use ground water under the direct influence of surface water typically monitor more frequently than a ground water system). Finally, public water systems are required to notify the public when they have violated these regulations. The 1986 Amendments and further revisions under 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 for the need to obtain alternative water supplies during the violation.

The SDWA allows States to seek U.S. EPA approval to administer their own PWSS Programs. The authority to run a PWSS Program is called primacy. To receive primacy, States must meet certain requirements in the SDWA and the regulations, including the adoption of drinking water regulations that are at least as stringent as the Federal regulations and provide a demonstration that they can enforce the program requirements. *Ohio is a primacy state.*

**Regulated Public Water Systems in Ohio**

In Ohio, a public water system is defined as a system that provides water via piping or other constructed conveyances 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. There are three types of public water systems (PWS):

- community water systems serve at least fifteen service connections used by year-round residents or regularly serve at least twenty-five year-round residents (e.g. cities; mobile home parks)
- non-transient non-community systems serve at least twenty-five of the same persons over six months per year (e.g. schools; businesses)
- transient non-community systems serves at least 25 different persons over 60 days per year (e.g. rest stops; parks)

These three type of systems use either a ground water source, surface water source, or use ground water under the direct influence of surface water. In addition, Ohio regulates the drinking water systems associated with agricultural migrant labor camps as defined by the Ohio Department of Agriculture even though they may not meet the minimum number of people or service connections. For this report when the acronym “PWS” is used, it means systems of all types unless specified in greater detail. In Ohio, 5,483 public water systems serve approximately 10.8 million people daily with an average production of approximately 1.6 billion gallons of water per day. This yields an average water use of 148 gallons per person per day. Table 1 summarizes the total number and percentage of active public water systems per type with the corresponding total population served daily. Table 2 summarizes the number of public water systems by source type.

The total number and percentage of PWS by population categories are presented in Table 3. An interesting note from this table is that 9 PWS, less than 1 percent of the total systems in the state, serve over 40 percent of the entire Ohio population.

**Table 1. Public Water System Summary by Category Type**

<b>PWS Category Type</b>	<b>Number of PWS per Category</b>	<b>Percentage of each PWS Type</b>	<b>Total Population Served Daily per Category</b>
Community (CWS)	1,324	24%	10,044,266
Non-Transient Non-Community (NTNC)	959	18%	232,841
Transient Non-Community (TNC)	3,200	58%	479,841
<b>Total</b>	<b>5,483</b>	<b>100%</b>	<b>10,756,948</b>

**Table 2. Public Water System Summary by Source Type**

PWS Category Type	Surface Waters	Ground Waters	Purchased Surface Waters	Purchased Ground Waters
Community (CWS)	121	928	178	97
Non-Transient Non-Community (NTNC)	7	942	2	8
Transient Non-Community (TNC)	17	3,167	2	14
<b>Total</b>	<b>145</b>	<b>5,037</b>	<b>182</b>	<b>119</b>

**Table 3. Public Water System Summary by Population Categories**

PWS Populations Categories	Number of PWS per Category	Percentage of the Total PWS for each Category	Total Population Served Daily per Category
Population: 25 - 500	4,490	82%	572,746
Population: 501 - 3,300	683	12.4%	856,923
Population: 3,301 - 10,000	155	2.8%	962,056
Population: 10,001 - 100,000	146	2.6%	3,862,239
Population: Greater than 100,000	9	0.2%	4,502,984
<b>Total</b>	<b>5,483</b>	<b>100%</b>	<b>10,756,948</b>

**Annual State PWS Compliance Report**

Ohio EPA submits data to U.S. EPA's Safe Drinking Water Information System (SDWIS/FED) on a quarterly basis. The data includes PWS inventory statistics, the incidence of MCL, major monitoring, treatment technique violations, and the enforcement actions taken against violators. This Annual Compliance Report provides a total annual representation of the number of violations for each of the four categories listed in section 1414(c)(3)(A)(i) of the Safe Drinking Water Act re-authorization, as well as consumer notification requirements. This report will analyze violation and compliance information for the 2004 calendar year using five categories: MCLs, treatment techniques, significant monitoring violations, consumer notifications, and variances and exemptions. This report was generated with the data available in Ohio EPA's database as of May 2005.

1. *Maximum Contaminant Level*

Under the SDWA, U.S. EPA sets national limits on contaminant levels in drinking water to ensure that the water is safe for human consumption. These limits are known as MCLs. When a PWS exceeds an MCL, it is required to notify the public of the violation within 24 hours for acute violations that may pose an acute risk to human health (e.g. nitrate; total coliform), and within 30 days for nonacute MCL violations (e.g. volatile organic chemicals; synthetic organic chemicals). In addition, the water system must continue to monitor regularly, as well as take steps to correct the contamination problem.

2. *Treatment Techniques*

For some regulations, the EPA establishes treatment techniques (TTs) in lieu of an MCL to control unacceptable levels of certain contaminants by a measurement of the treatment process. Treatment techniques have been established for viruses, some bacteria, turbidity, lead and copper and disinfection by-product precursors.

3. *Monitoring*

A PWS is required to monitor and verify that the levels of contaminants present in the water do not exceed the MCL. If a PWS fails to have its water tested as required, then a monitoring violation occurs. A monitoring violation also includes failure to report test results correctly to the State. These violations occur when a system misses one or more of several sampling events, or samples but does so outside the required time period. When a PWS fails to have its water tested as required, it is required to notify the public of the violation within 30 days. For a system monitoring less frequently than quarterly, it is required to sample for the contaminant(s) missed, in order to return to compliance.

*Return to Compliance*

As noted in the definition of monitoring violations, systems which monitor less frequently than quarterly can return to compliance. Some systems can return to compliance if they monitor for the missed contaminants or submit reports late. In this report, return to compliance rates were determined for inorganic contaminants; nitrate; nitrite; regulated volatile organic contaminants; synthetic organic contaminants; total trihalomethanes; five haloacetic acids (DBPs); and radiological contaminants, as a group.

*Significant Monitoring Violations*

For this report, significant monitoring violations are defined as any major monitoring violation that has occurred during the specified report interval. A major monitoring violation occurs when no samples were taken or no results are reported during a compliance period.

4. *Consumer Notification*

Every Community Water System is required to deliver to its customers a brief annual water quality report - a Consumer Confidence Report (CCR). This report is to include some educational material, and will provide information on the source water, the levels of any detected contaminants, and compliance with drinking water regulations.

*Significant Consumer Notification Violations*

A significant public notification violation occurred if a community water system completely failed to provide its customers the required annual water quality report.

5. *Maximum Residual Disinfectant Level*

U.S.EPA sets national limits on residual levels in drinking water to reduce the risk of exposure to

disinfectant byproducts formed when PWS add chemical disinfectant for either primary or residual treatment. These limits are known as Maximum Residual Disinfectant Levels (MRDLs).

### Compliance Table Summary Analysis

A summary table of PWS compliance rates and violations for the 2004 calendar year is included in Appendix A. The information summarized in the table includes the total number of PWS required to monitor during the 2004 calendar year; total number of violations; total number of systems with a violation; and percent compliance achieved for a particular regulated contaminant in three different violation categories. These violation categories are MCL, Treatment Technique and Monitoring/CCR. The regulatory contaminant categories include: organic contaminants, inorganic contaminants, and radionuclide contaminants, all of which are classified as the MCL contaminant group; total coliform bacteria regulations (TCR); surface water treatment regulations (SWTR); interim enhanced surface water treatment regulations (IESWTR); lead and copper regulations, and CCR notifications.

Violation totals and compliance rates for each of the contaminant groups are presented in Table 4. Compliance rates are based on the total number of systems *required to* comply with each of the contaminant categories. For example, the 91 % CCR compliance rate is based on 1,324 systems required to send notifications with 119 systems failing to comply.

**Table 4. Violation Totals and Compliance Rates per Contaminant Group Category**

Contaminant Category	MCL			Treatment Technique			Monitoring or CCR notifications		
	Violations	No. of Systems in Violation	Comp. Rate	Violations	No. of Systems in Violation	Comp. Rate	Violations	No. of Systems in Violation	Comp. Rate
MCL Contaminant Group <sup>1</sup>	87	51	99.0%				3,027	598	89%
TCR <sup>2</sup>	703	477	91%				1562	1031	81%
SWTR <sup>3</sup>				154	27	81%	4	3	98%
Lead and Copper				1	1	96%	92	89	91%
CCR <sup>4</sup>							128	119	91%
TOC <sup>5</sup>				13	3	98%	15	9	93%
IESWTR <sup>6</sup>				2	1	98%	3	1	98%

<sup>1</sup>MCL Contaminant Group includes volatile organic, synthetic organic, inorganic, total trihalomethanes, haloacetic acid, nitrate and nitrite chemicals and radiological contaminants

<sup>2</sup>total coliform rule

<sup>3</sup>surface water treatment rule

<sup>4</sup>consumer confidence reports

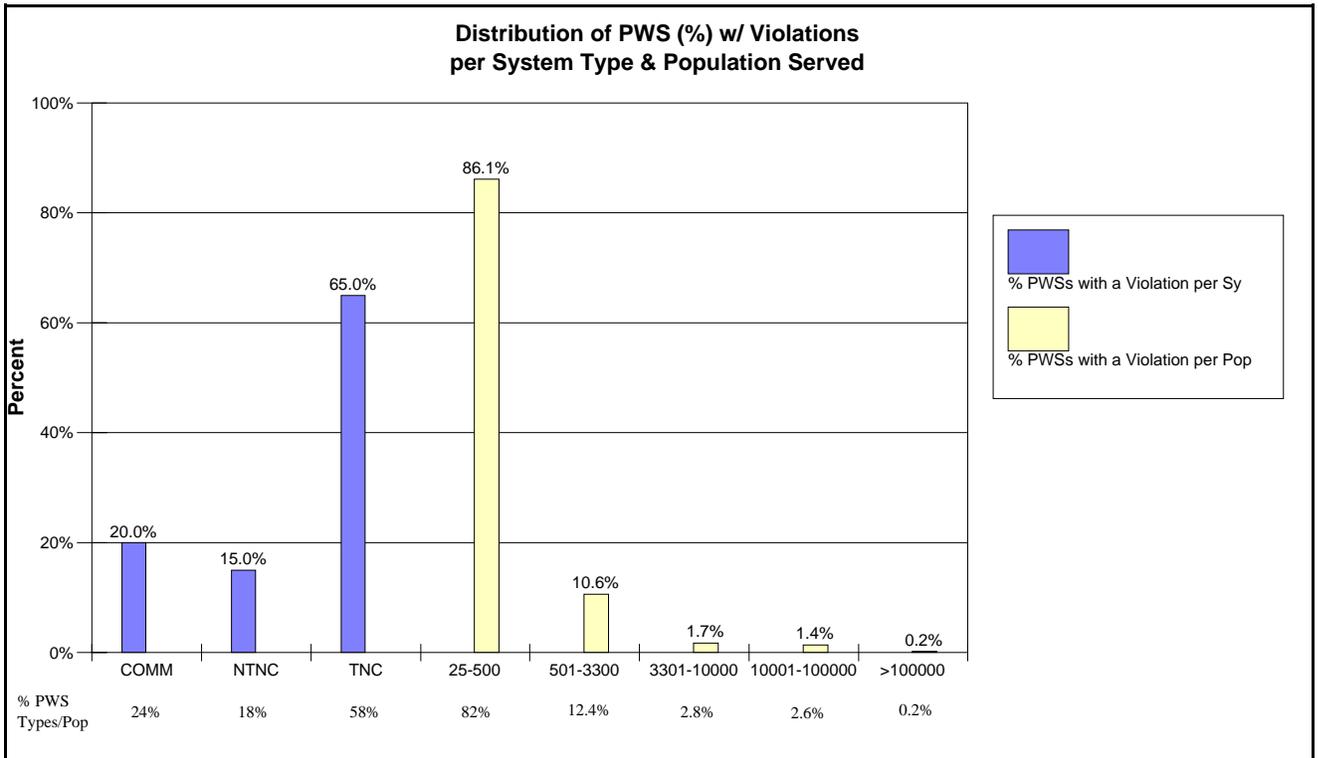
<sup>5</sup>total organic carbon

<sup>6</sup>interim enhanced surface water treatment rule

**Table 5. State of Ohio Violation Totals for 2004**

	MCL	Monitoring	CCR	Treatment Technique	Totals
Number of Systems in Violation	528	1417	119	30	1708
Number of Violations	790	4703	128	172	5793

Figure 1.



As depicted in Figure 1, of all water systems with at least one violation, 65 percent were associated with TNC water systems, 15 percent with NTNC water systems and 20 percent with CWS. Of the PWS having one or more violations, 86 percent were associated with a population served category of serving fewer than 500 people per day.

Approximately 81 percent of the violations in Ohio occur because public water systems fail to monitor and report for various required contaminants in the period as specified on an individual system monitoring schedule provided by the Director of Ohio EPA or by rule, or as a result of failing to collect follow-up or repeat samples. An average of 56 percent of systems returned to compliance following their violation(s) (see the definition of “return to compliance” for the list of contaminants included in the calculation). A detailed analysis of each contaminant group and violation category is presented below. When sufficient data was available, charts displaying the number of water systems with a violation per system type and population categories have been prepared and included in this report.

**MCL Contaminant Group**

The total number of violations and total number of water systems with at least one violation in the MCL Contaminant Group is presented in more detail in Table 6.

**Table 6. Violation Totals and Compliance Rates for the Individual MCL Contaminant Group Constituents**

Contaminant Category	MCL				Monitoring Requirements			
	Violations	No. of Systems in Violation	No. of Systems Required to Monitor*	Comp. Rate	Violations	No. of Systems in Violation	No. of Systems Required to Monitor*	Comp. Rate
VOCs <sup>1</sup>	0	0	1188	100.0%	1701	63	1188	95.0%
SOCs <sup>2</sup>	0	0	356	100.0%	83	17	356	95.0%
TTHMs <sup>3</sup>	64	39	1512	97.0%	66	62	1512	96.0%
HAAs	4	3	1512	99.0%	66	64	1512	96.0%
IOCs <sup>5</sup>	2	2	1559	99.0%	486	80	1559	95.0%
Nitrate	16	7	5109	99.0%	473	385	5109	93.0%
Nitrite	0	0	2091	100.0%	69	69	2091	97.0%
Rads <sup>6</sup>	1	1	135	99.0%	83	26	135	81.0%

<sup>1</sup>volatile organic chemicals

<sup>2</sup>synthetic organic chemicals

<sup>3</sup>total trihalomethanes

<sup>4</sup>haloacetic acids

<sup>5</sup>inorganic chemicals

<sup>6</sup>radiological contaminants

\* The number of systems required to monitor for the different IOCs and SOC's varies, but 1559 PWS were required to monitor for at least one of the inorganic chemicals, and 356 PWS were required to monitor for at least one of the SOC's. See Appendix A for details.

### Organic Contaminants

The organic contaminants group summarized in the Compliance Table include: volatile organic chemicals (VOCs); synthetic organic chemicals (SOCs); total trihalomethanes (TTHMs) and haloacetic acids (HAAs).

**VOCs** are predominantly used as solvents, degreasers, cleaning solutions, dry cleaning fluids, and components of pesticides and plastics. These chemicals are described as volatile because of their tendency to evaporate. They generally enter drinking water systems through spills and improper disposal. VOCs are monitored by all community and NTNC PWS (including 2 purchased water systems) on one of three schedules based on source type and past monitoring history: one sample quarterly, one sample annually, or one sample in 3 years. During 2004, 1188 public water systems were required to sample at least once for VOCs. A significant difference to note between monitoring for VOCs and other contaminant groups is that every time a PWS samples for VOCs, they are required to have the sample analyzed for all 21 regulated VOC compounds using one analytical method which scans for all of the compounds. So, for each missed VOCs sample, a PWS would have 21 violations for the regulated VOC compounds. This creates an artificially high number of violations for the VOCs group as well as the total number of violations issued in Ohio. There are 1701 individual VOC compound M/R violations. This really represents 81 VOCs samples which were not collected. There were 63 of the 1188 public water systems required to sample during 2004 that failed to collect one or more samples which resulted in a M/R violation. Overall compliance for the VOCs M/R is 95 percent, up from 90 percent in 2003. Approximately 70 percent of the VOC M/R violations were associated with NTNC systems. Of those public water systems with a VOCs M/R violation, 86 percent were associated with water systems serving less than 500 people. No systems exceeded any of the VOCs MCLs.

### VOC Contaminant Group Highlights

- ▶ 1188 public water systems required to collect VOCs samples
- ▶ 100 percent compliance with all VOCs MCLs
- ▶ 95 percent of the public water systems are in compliance for the VOCs M/R category
- ▶ 1701 individual VOC compound violations
- ▶ 86 percent of the VOCs M/R violations occurred at PWS serving less than 500 people

**SOCs**, which includes primarily pesticides, are monitored by all community and NTNC PWS (and 2 purchased water systems). Some of the SOC's are monitored more often than others because they are used in large quantities on Ohio farm fields, like alachlor, atrazine, and simazine. Based on Ohio's pesticide study, some systems are required to monitor more frequently during time periods which are most likely to see occurrence of the contaminants.

Ground water systems monitor for alachlor, atrazine, and simazine at least once every three years. If a ground water system has a detection for one of these SOC's, they are required to monitor at a minimum on a quarterly basis.

Because Ohio's surface water systems are more vulnerable to pesticide contamination, they are required to monitor for alachlor, atrazine, and simazine every year at a much greater frequency, including every-other-week May thru July for systems that have a history of elevated pesticide levels in their finished water.

All systems are required to monitor the remaining 14 SOC's once every three years if they have a mean nitrate measurement greater than 2 mg/L. Nitrate is used as an indicator of a system's susceptibility. Monitoring waivers are granted for systems that have a mean nitrate concentration less than or equal to 2 mg/L. The waivers are granted for a 3-year period and must be renewed when that period lapses.

During the 2004 calendar year, 356 public water systems were required to sample for one or more of the SOC compounds. All of the SOC's violations incurred during the 2004 calendar year were related to M/R requirements. No public water systems incurred an SOC's MCL during 2004. The overall M/R compliance rate for 2004 is 95 percent, up from 94 percent in 2003, when 215 systems were required to monitor.

### SOC Contaminant Group Highlights

- ▶ 356 public water systems required to sample for SOC's
- ▶ 100 percent compliance with all SOC's MCLs
- ▶ 95 percent of the public water systems were in compliance for all SOC's M/R
- ▶ 59 percent of the M/R violations occurred at PWS serving less than 500 people

**TTHMs** are classified as organic disinfection by-products. They are created when organic and inorganic compounds react with the disinfectant added to the water. (It is important to note that disinfectants are an important part of the control of water-borne pathogens.) TTHMs are sampled in the distribution systems of community and noncommunity PWS that treat their water with any combination of chlorine, chloramines, chlorine dioxide or ozone. Community water systems and nontransient noncommunity surface water systems serving less than 10,000 persons, and nontransient noncommunity ground water systems that disinfect were required to sample for TTHMs beginning in 2004.

During the 2004 calendar year, 1512 PWSs were scheduled to monitor quarterly for TTHMs. There were 62 systems that failed to monitor, and 39 systems exceeded the MCL of 0.080 milligrams per liter (mg/L).

Compliance with the TTHM MCL is determined by calculating a running annual average at the end of each quarter. Some people who drink water containing TTHMs in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

**HAAs** are another class of organic disinfection by-products that form when a disinfectant reacts with organic matter in the water. Community water systems and nontransient noncommunity surface water systems serving less than 10,000 persons, and nontransient noncommunity ground water systems that disinfect were required to sample for HAAs beginning in 2004.

During the 2004 calendar year, 1512 PWSs were scheduled to monitor quarterly for haloacetic acids. Sixty-four of these systems failed to monitor for haloacetic acids. Three systems exceeded the MCL of 0.060 mg/L.

**TTHMs and HAAs Contaminant Group Highlights for US EPA Required Sampling**

- ▶ 1512 public water systems required to sample for TTHMs
- ▶ 1512 public water systems required to sample for HAAs
- ▶ 97 percent compliance with the TTHMs MCL
- ▶ 99 percent compliance with the HAAs MCL
- ▶ 96 percent compliance for TTHMs M/R
- ▶ 96 percent compliance for HAAs M/R

Figures 2 and 3 show VOCs, SOCs, TTHMs, and HAAs violation numbers by population categories and system types, respectively. For specific information on each contaminant, such as the number of PWSs required to sample a contaminant in 2004 and how many violations occurred for that contaminant, please refer to the Appendix A Compliance Table.

Figure 2.

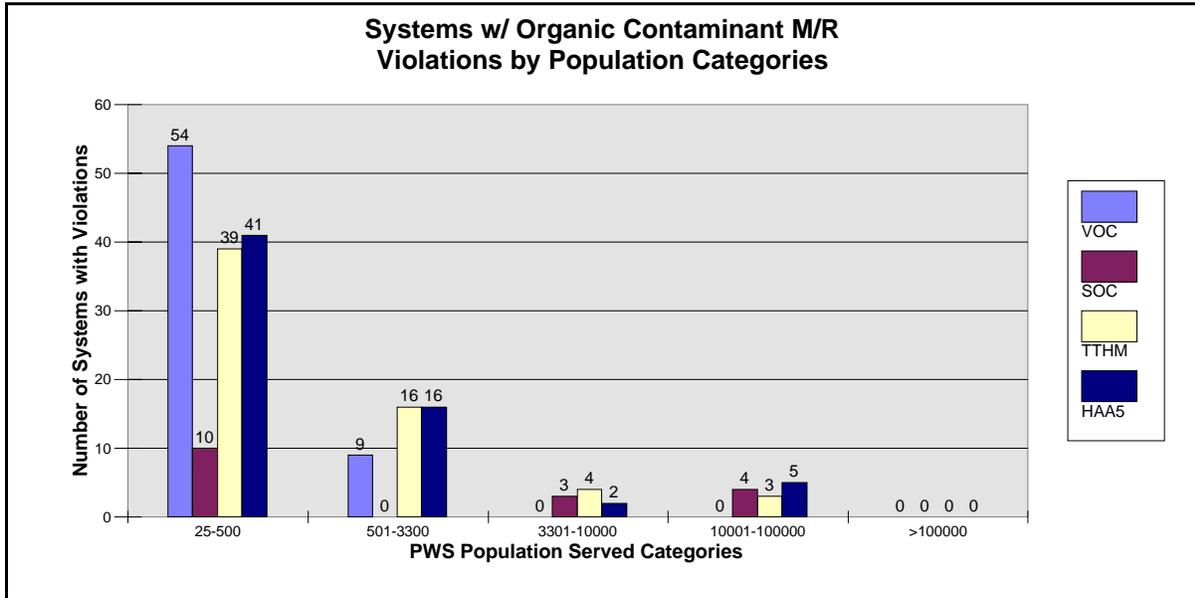
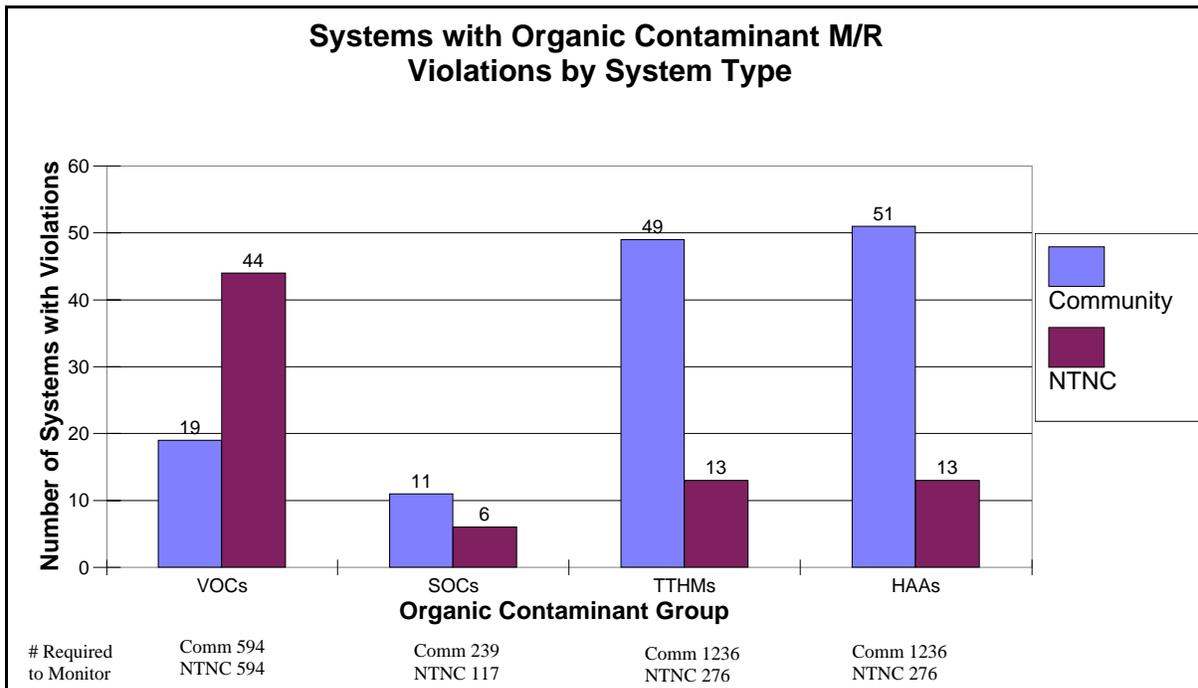


Figure 3.



### **Inorganic Contaminants**

The inorganic contaminant group summarized in the Appendix A Compliance Table includes metals (e.g. chromium, cadmium, mercury, etc.) and non-metal contaminants (e.g. asbestos, cyanide, nitrate, etc.). Many of these naturally occurring chemicals are also used in different manufacturing processes. Nitrate and nitrite are separated out as a group from the other IOCs for monitoring purposes and they are discussed in a separate section below. Both IOCs and Nitrate/Nitrite violation numbers are shown in Figures 4 and 5.

Except for nitrate and nitrite, IOCs are monitored by all community and NTNC PWS (and 2 purchased systems). Most IOCs are monitored by surface water systems on an annual basis and by ground water systems once in 3 years. One exception is asbestos, which is monitored once in 9 years. During the 2004 calendar year, 1559 public water systems were required to sample for at least one of the 13 individual IOC compounds. The overall M/R compliance rate for the IOCs contaminant group is 95 percent, up from 91 percent in 2003. Of the 80 water systems with an IOCs M/R violation, approximately 53% were community water systems, and 47% were non-community water systems. However, 70 percent of all violations were associated with water systems serving less than 500 people. One system exceeded the arsenic MCL (0.05 mg/L), and 1 system exceeded the asbestos MCL (7 million fibers/liter greater than or equal to 10 um long). Arsenic is a naturally occurring element that can cause skin damage, circulatory problems and cancer. Asbestos is a fibrous mineral occurring in natural deposits that was used in cement pipe for distributing water to communities. Asbestos can increase the risk of developing benign intestinal polyps.

### **IOC Contaminant Group Highlights**

- ▶ 1559 public water systems were required to sample for at least one IOCs
- ▶ 99 percent compliance with all IOCs MCLs
- ▶ 95 percent of the public water systems were in compliance for IOCs M/R
- ▶ 70 percent of the M/R violations were associated with public water systems serving fewer than 500 people

### **Ntrate/Nitrite**

Nitrate contamination of drinking water usually results from runoff of agricultural fertilizers, or from human or animal wastes, such as feedlots or faulty septic systems. Nitrite is the reduced form of nitrate, and is usually found in nature at lower levels than nitrate. Nitrate is monitored by all CWS, NTNC, and TNC PWS (and 2 purchased systems). Nitrate is monitored monthly by surface water systems, ground water systems under the direct influence of surface water, and by systems using treatment to remove nitrate. Ground water systems monitor annually for nitrate. Some ground water systems may be monitoring quarterly for nitrate based upon the levels reported in previous sampling. All community and nontransient systems were required to monitor for nitrite during 2004. Occurrence of nitrate, nitrite or nitrate/nitrite may require the systems to do additional monitoring. During the 2004 calendar year, 5,109 water systems were required to monitor for nitrate and 2091 water systems were required to monitor for nitrite.

The compliance rate for nitrate M/R during 2004 is 93 percent (up from 92 percent in 2003), and 97 percent for nitrite (up from 84 percent in 2003). Of the 413 water systems with a nitrate or nitrite violation during the 2004 calendar year, 83 percent were issued to TNC water systems and approximately 92 percent of the violations were associated with systems serving fewer than 500 people.

During the 2004 calendar year, 16 nitrate MCL violations occurred at 7 water systems. In 2003, there

were 43 MCL violations at 19 systems. There were no MCL violations for nitrite during 2004. Infants below the age of six months who drink water containing nitrate or nitrite in excess of the MCL could become seriously ill and if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.

**Nitrate/Nitrite Contaminant Group Highlights**

- ▶ 5109 public water systems were required to sample for nitrate and 2091 for nitrite
- ▶ 99 percent compliance rate for nitrate MCLs
- ▶ 100 percent compliance rate for nitrite MCLs
- ▶ 16 nitrate MCL violations occurred at 7 water systems
- ▶ 93 percent of the public water systems were in compliance for nitrate M/R
- ▶ 97 percent of the public water systems required to monitor were in compliance for nitrite M/R
- ▶ 92 percent of the M/R violations were associated with public water systems serving fewer than 500 people

For specific information on each contaminant, such as the number of PWS required to sample a contaminant in 2004 and how many violations occurred for that contaminant, please refer to Appendix A-Compliance Table.

Figure 4.

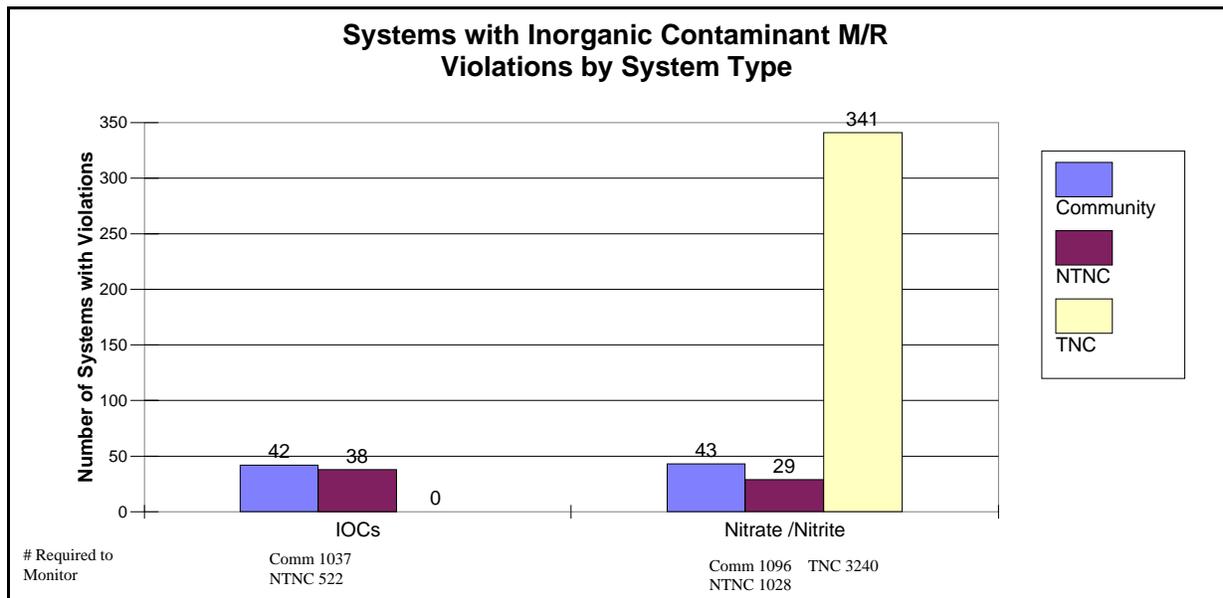
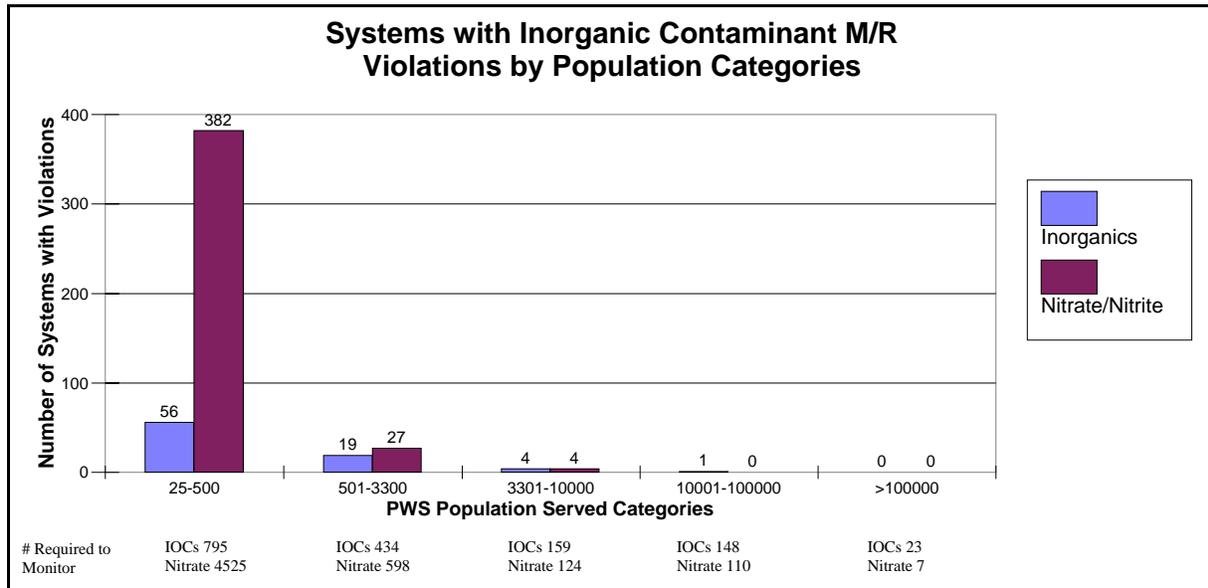


Figure 5.



### Radionuclide Contaminants

The radionuclide group, which includes the contaminants gross alpha, gross beta, radium-226 and radium-228, and uranium, occurs from the erosion or decay of natural and manmade deposits. Drinking water containing radionuclide contaminants in excess of the MCL may increase the risk of getting cancer. Radium-226 is only monitored individually when a PWS exceeds the gross alpha action level of 5 pCi/L.

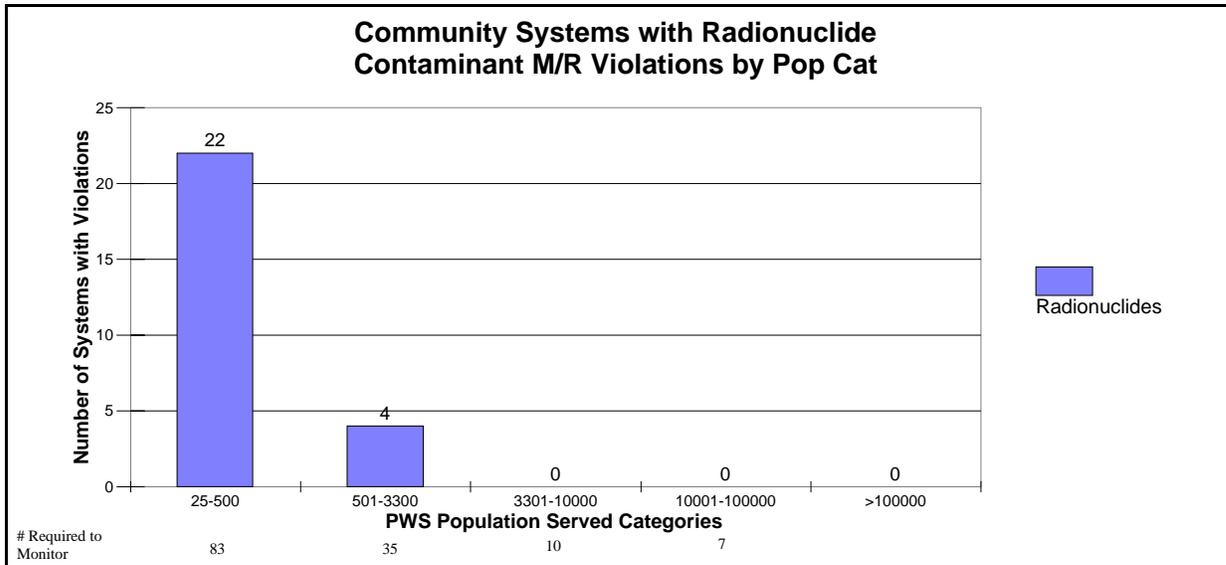
Radionuclides are monitored by all community PWSs (including 2 purchased systems). Initially, systems monitor for radionuclides quarterly, unless they qualified for reduced monitoring at three, six, or nine year intervals. If the MCL is exceeded, systems must perform quarterly monitoring. During the 2004 calendar year, 135 water systems were required to monitor for radionuclides. The overall radionuclide MCL compliance rate is 99 percent. The overall compliance rate for radionuclide M/R is 81 percent (many of the rad M/R violations occurred prior to the expansion of the reminder postcard assistance program). Of the 26 M/R violations during the 2004 calendar year, 85 percent were associated with systems serving fewer than 500 people.

### Radionuclides Contaminant Group Highlights

- ▶ 135 public water systems were required to sample for radionuclides
- ▶ 99 percent compliance rate for radionuclide MCLs
- ▶ 81 percent of the water systems were in compliance for radionuclides M/R
- ▶ 85 percent of the M/R violations were associated with public water systems serving fewer than 500 people

For specific information on each contaminant, such as the number of PWSs required to sample a contaminant in 2004 and how many violations occurred for that contaminant, please refer to Appendix A.

Figure 6.



### Total Coliform Regulations

Total coliform monitoring is used to determine if microbiological contaminants are present in drinking water. Total coliform is a family of bacteria which contain pathogenic as well as harmless organisms. Fecal coliform and *E. coli* bacteria are specific types of coliform bacteria which are associated with animal waste and present an acute human health threat. Microbiological pathogens can cause gastrointestinal illness and pose a special risk to children, the elderly and those individuals with suppressed immune systems. In Ohio, a total coliform (TC) test is used initially as a screening to indicate whether or not microbiological contaminants may be present. If a sample is TC positive (total coliform bacteria is present), further analysis for either fecal coliform or *E. coli* and the collection of additional samples are required to determine if potentially harmful contamination is present. TC is monitored by all PWSs. The frequency of TC testing and the number of samples collected is dependent upon the type of PWS, the population served and source type. Sampling requirements range from as few as one TC sample per quarter for small TNC water systems to hundreds of TC samples per month for large community water systems. Ohio's minimum monitoring requirements of one sample per quarter can be up to four times as frequent as the federal requirements. Two types of MCL violations, acute and non-acute, are associated with the total coliform regulations. An acute violation occurs when more than one sample is total coliform positive and at least one sample contains *E. coli* or fecal coliform bacteria. An acute violation also occurs in Ohio when an insufficient number of samples are collected following one or more TC positive samples (this is more stringent than federal requirements). Non-acute MCL violations occur when greater than 5 percent (or 2 or more samples if collecting less than 40 samples per month) of all the samples collected during a month are TC positive.

During the 2004 calendar year, the compliance rate for TC acute MCL violations was 96 percent (95% in 2003) and 94 percent for non-acute MCL violations (93% in 2003). Of the 477 water systems with TC MCL violations, 76 percent were associated with TNC water systems, and 92 percent were associated

with water systems serving less than 500 people. The majority of acute MCL violations can be attributed to Ohio assigning an acute MCL violation to a water system failing to collect a sufficient number of samples following a positive total coliform sample. Creating an additional acute MCL violation is most protective of public health, but results in higher numbers of acute MCL violations for Ohio. Of the 5,483 PWSs sampling for total coliform, approximately 93 (or 2 percent) have detected *E. coli* or fecal coliform.

Major routine and follow-up M/R violations for the TC regulations are incurred by water systems when they fail to sample or report all of the required samples during a given monitoring period. Of the water systems with one or more major routine and follow-up M/R violations, 81 percent were associated with TNC water systems and 95 percent were associated with water systems serving less than 500 people.

**Total Coliform Contaminant Group Highlights**

- ▶ 5,483 public water systems were required to sample for TC
- ▶ 96 percent compliance with the acute MCL
- ▶ 94 percent compliance with the non-acute MCL
- ▶ 81 percent compliance with the TC M/R requirements
- ▶ 95 percent of the M/R violations and 92 percent of MCL violations were associated with public water systems serving fewer than 500 people, mostly TNC water systems

Figure 7.

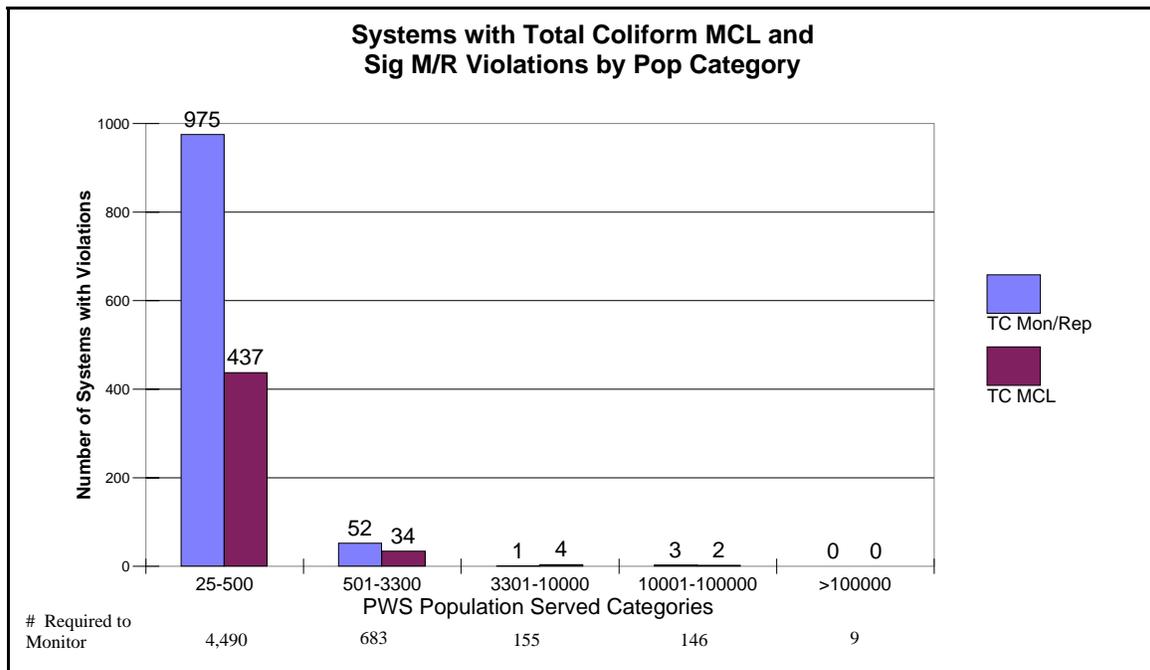
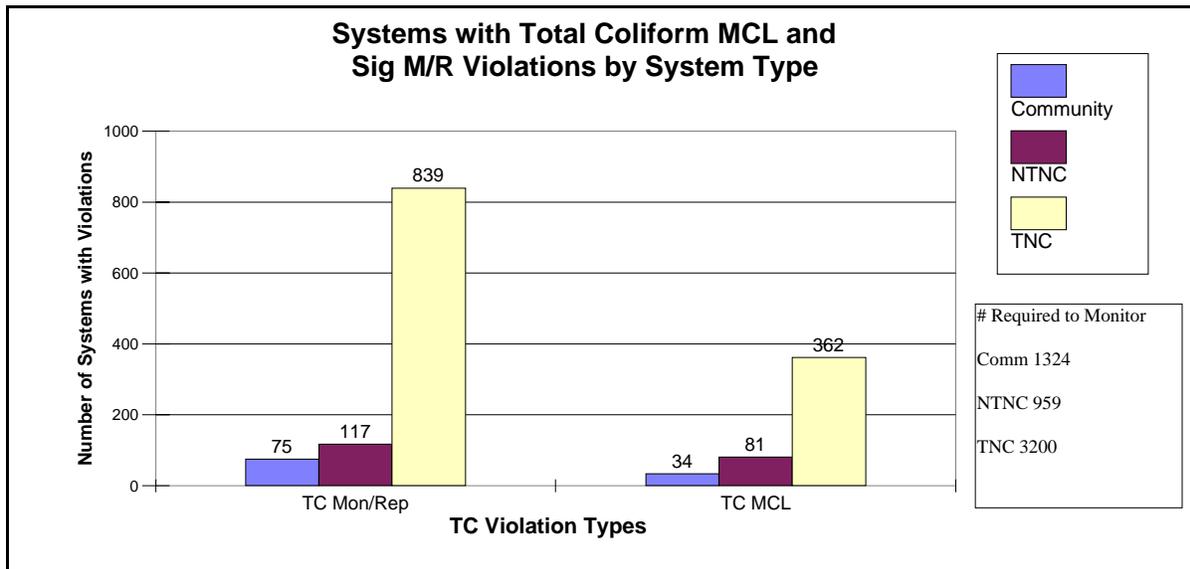


Figure 8.



### Surface Water Treatment Regulations

The surface water treatment regulations (SWTR) in Ohio establish treatment and monitoring standards for water systems that have sources designated as surface water or ground water under the direct influence of surface water. Ground water under the direct influence (GUDI) of surface water are systems that use wells to obtain their water, but the water quality is subject to the influence of surface water. GUDI systems have 18 months, by rule, to eliminate the causes of the GUDI designation or install surface water treatment. The influence of surface water can be from unacceptably constructed wells to the type of aquifer from which the system is drawing. Public water systems subject to these regulations are required to provide filtration and disinfection of the water. The surface water treatment requirements are designed to inactivate, kill or remove pathogens found in surface water. Microbiological pathogens can cause gastrointestinal illness and pose a special risk to children, the elderly and those individuals with suppressed immune systems. Water quality tests are performed on the water to ensure treatment is being maintained at a level that should prevent contamination. Tests include evaluation and measurement of sufficient chlorination contact time, filtration type and effectiveness, turbidity levels, and residual chlorine levels in the distribution system. Failure to meet one or more of these standards results in a monthly treatment technique (TT) violation. During the 2004 calendar year, 145 water systems were subject to the SWTR TT and M/R requirements. The overall SWTR TT compliance rate is 81 percent (71% in 2003). The majority of water systems with these violations are the systems designated ground water under the direct influence of surface water (GUDI). The overall compliance rate for SWTR M/R is 98 percent (97% in 2003). Of the 27 water systems with a TT violation during the 2004 calendar year, 67 percent were associated with systems serving fewer than 500 people.

Surface water systems serving a population of greater than 10,000 were required to meet lower turbidity requirements and expanded performance standards in 2003 under the Enhanced Surface Water Treatment Rules. Overall, the large systems have been meeting all the new requirements. There were only 2 TT violations and 2 M/R violations at the large surface water systems.

**SWTR Contaminant Group Highlights**

- ▶ 145 public water systems were subject to the SWTR monitoring and treatment requirements
- ▶ 81 percent of the public water systems were in compliance with the TT requirements
- ▶ 98 percent of water systems which provide treatment were in compliance with the SWTR M/R requirements
- ▶ 67 percent of the water systems with a TT violations were associated with water systems serving fewer than 500 people

Figure 9.

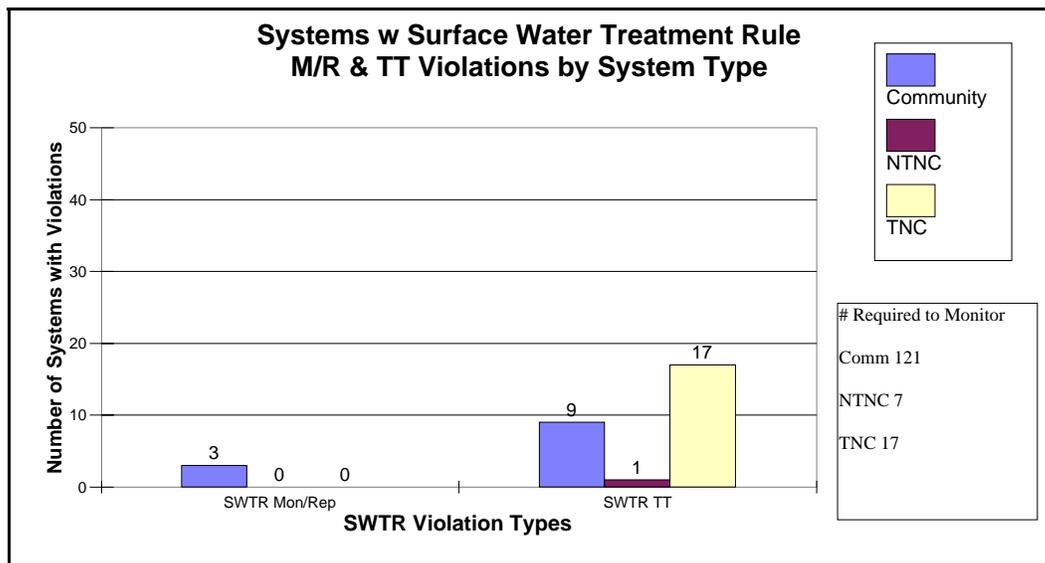
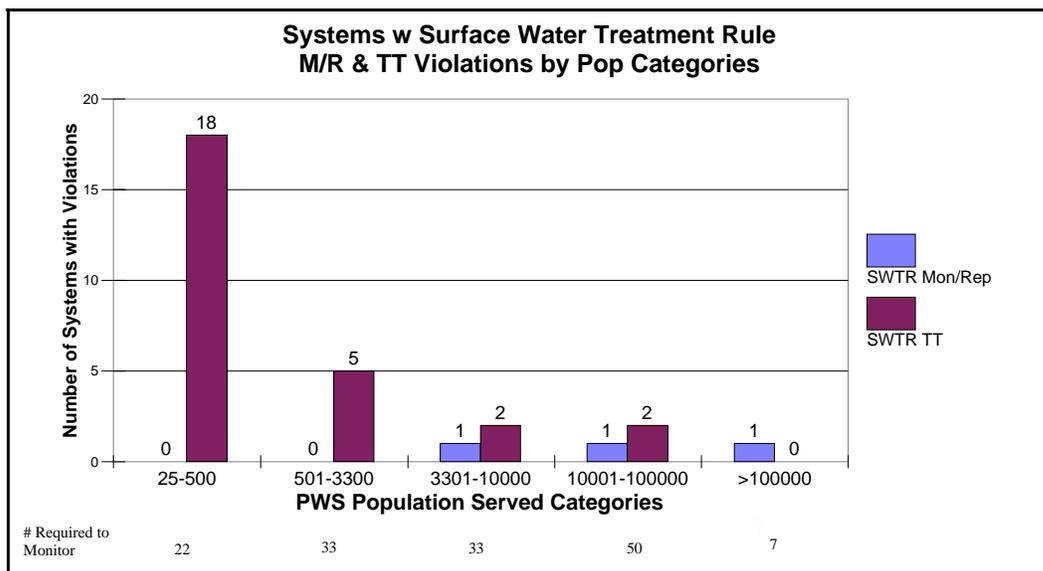


Figure 10.



### Lead and Copper Regulations

The lead and copper regulations in Ohio establish standards for levels of lead and copper in the distribution systems of community and NTNC public water systems. Although lead and copper are found in natural deposits, they typically enter tap water through corrosion of plumbing materials. During the beginning phases of monitoring, these public water systems are required to perform initial monitoring during two consecutive six month periods. Following completion of these periods, routine annual or triennial monitoring periods are required. For the 2004 calendar year, 99 water systems were required to perform initial monitoring and 906 systems were required to perform either annual or triennial monitoring. In addition, 28 systems were required to perform public education notification due to an exceedance of the lead action level. Lead can affect the physical and mental development in children, as well as cause kidney problems and high blood pressure in adults. The overall compliance for lead and copper monitoring is 91 percent (91% in 2003). Of the 89 water systems with lead and copper violations, 92 percent were associated with systems serving fewer than 500 people.

### Lead and Copper Contaminant Group Highlights

- ▶ 1033 public water systems were required to perform initial, annual or triennial monitoring and public education requirements
- ▶ 91 percent of water systems were in compliance with the lead and copper M/R requirements
- ▶ 92 percent of the water systems with a lead and copper M/R violation were associated with public water systems serving fewer than 500 people
- ▶ 3 percent of water systems exceeded the lead action level

Figure 11.

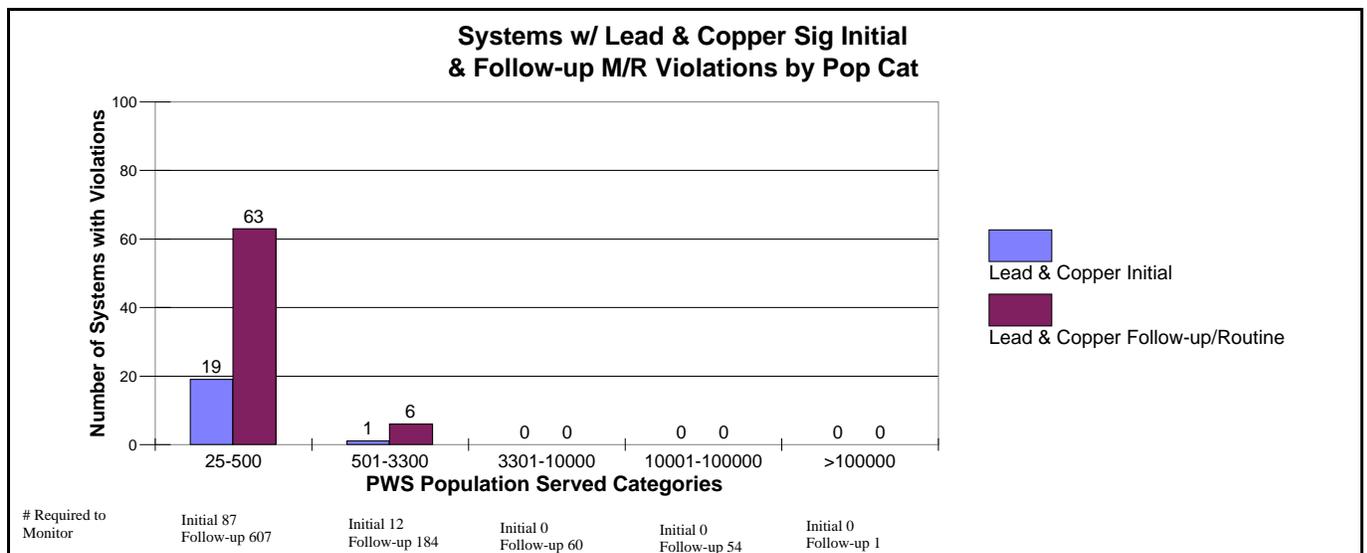
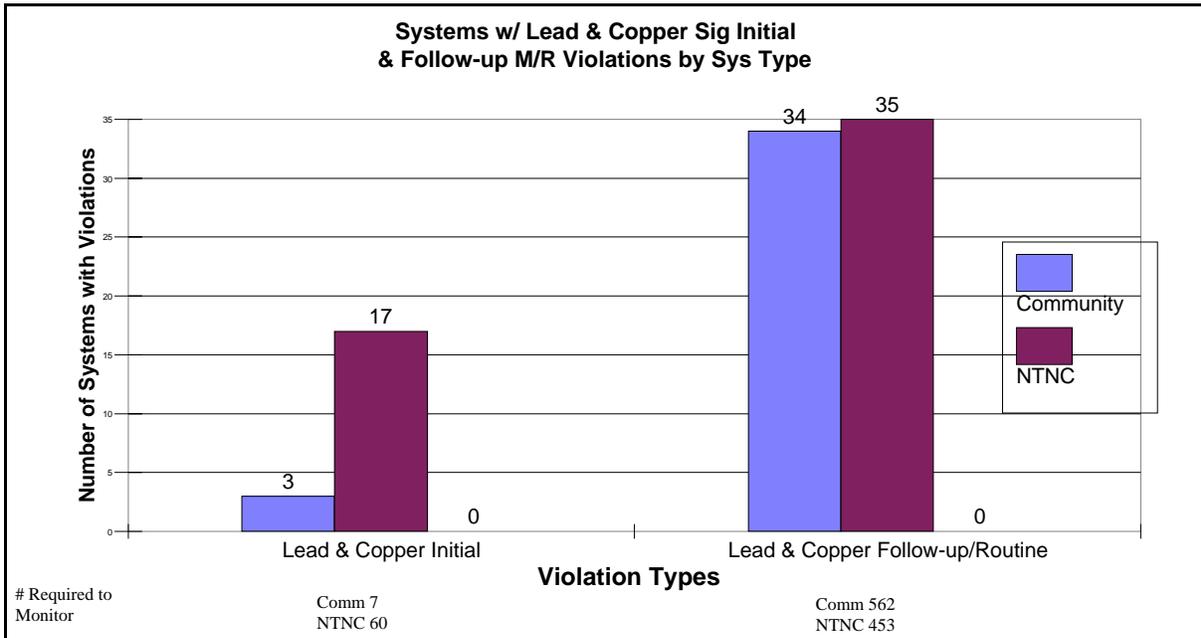


Figure 12.



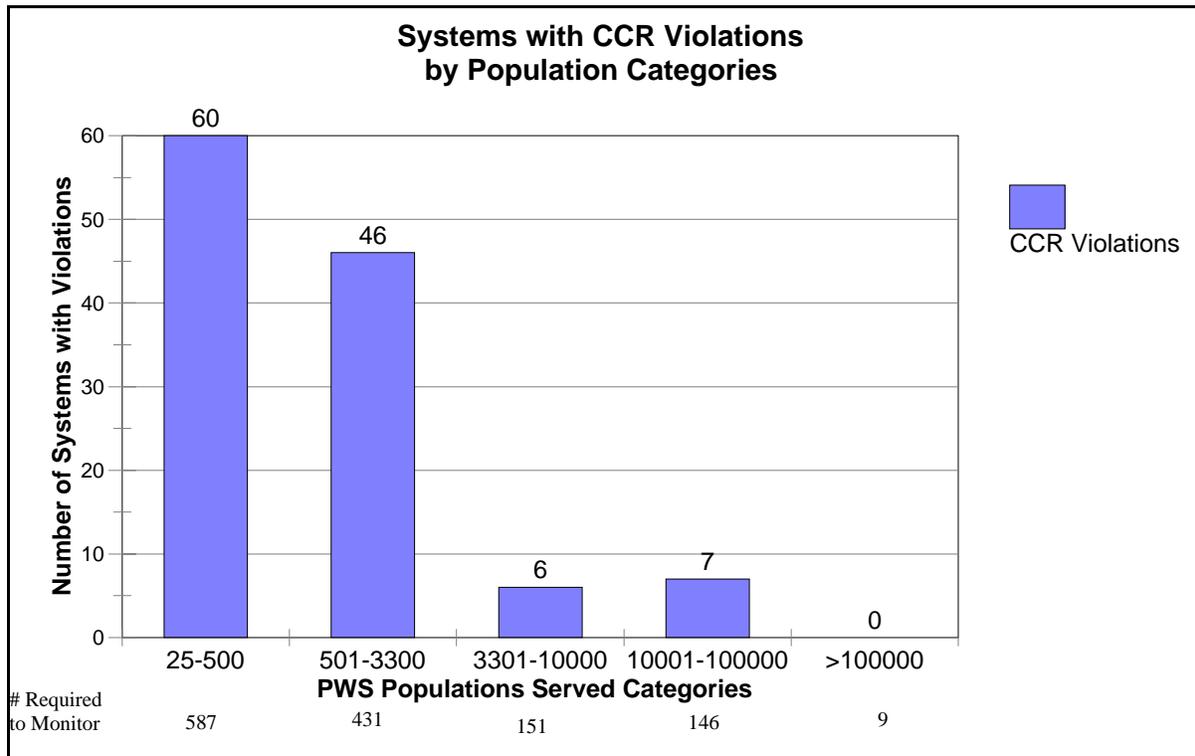
### Consumer Confidence Reports

Every Community Water System is required to deliver to its customers a Consumer Confidence Report (CCR). This report is to include some educational material, provide information on the source water, levels of any detected contaminants, and compliance with drinking water regulations. A significant public notification violation occurred if a community water system completely failed to provide its customers the required annual water quality report. A total of 1,324 community water systems were required to provide their customers with a CCR. For the 2004 calendar year, 76 systems failed to provide this report in violation of these requirements, and 52 systems that provided a CCR did not include all the required content which resulted in a violation. Of the 119 systems failing to meet these requirements, 50 percent were communities serving less than 500 people. Figure 13 shows the breakdown of community water systems in violation by population served. The overall compliance for CCR requirements is 91 percent (89% in 2003).

### Consumer Confidence Report Highlights

- ▶ 1,324 public water systems were subject CCR requirements
- ▶ 91 percent of the water systems were in compliance with the requirements
- ▶ 50 percent of the systems that had CCR notification violations were associated with systems serving less than 500 people

Figure 13.



**Compliance Summary**

The large majority of Ohio’s public water systems continued to comply with federal health-based standards for drinking water in 2004. Overall compliance rates were similar or better than the compliance rates in 2003. Highlights for 2004 include:

- Ninety-nine percent of all public water systems met the chemical standards (99% in 2003);
- Ninety-one percent of all public water systems met the bacteriological standards (90% in 2003);
- Eighty-nine percent of all public water systems met their chemical monitoring/reporting requirements (87% in 2003);
- Eighty-one percent of all public water systems met their bacteriological monitoring/reporting requirements (79% in 2003);
- Eighty-one percent of the violations that occurred during 2004 were the result of public water systems failing to monitor or report in a timely fashion.
- Approximately eighty-six percent of the violations occurred at water systems serving fewer than 500 individuals.
- Sixty-five percent of the violations occurred at transient non-community systems (e.g. campgrounds);

gas stations)

- Fifty-six percent of systems that monitor less frequently than quarterly submitted results after receiving a violation.

### **Ohio EPA's Public Water System Compliance Assistance**

Ohio EPA employs various methods to assist public water systems in achieving compliance with the Safe Drinking Water Act regulations. Some of the methods that may be used include: providing a sampling and monitoring schedule for each public water system; offering technical assistance during facility inspections (sanitary surveys) and follow-up visits; assisting in investigations of contamination; performing investigatory monitoring; providing off-site assistance through phone calls and meetings; providing outreach training sessions for new rules and treatment; assistance in finding funding for projects; providing operator and laboratory personnel training sessions; distributing reminder postcards and/or contacting the water systems towards the end of the monitoring period to ensure collection of the required samples; and sending notice of violation letters for failure to meet the requirements for each specific regulation. The use of these methods is based on the availability of Ohio EPA personnel and resources. During 2004, Ohio EPA continued the 2003 initiative for compliance assistance when a compliance assurance officer was added at the Northeast District Office. The compliance assurance officer assists water systems serving less than 250 population in technical aspects of water plant operation, with a primary focus on systems that have a history of compliance problems or are presently under a boil advisory.

In 2004, Ohio EPA expanded its technical assistance to small water systems. The reminder postcard program, which helped raise transient nitrate compliance rates significantly, was expanded to the other MCL contaminant groups. Beginning during the second quarter of 2004, approximately 1700 reminder postcards were issued throughout the year, raising M/R compliance further. This program will be expanded in 2005 to the bacteriological program. Ohio EPA is also using an automatic email system and the internet to head off violations before they are generated through contacts with the laboratories and public water systems. Ohio EPA is also looking at other ways to use its enforcement tools to address violations at the very small systems. These efforts are targeted to reducing the number of monitoring and reporting violations. As this report demonstrates, monitoring and reporting violations are the majority of Ohio's public water system violations. Ohio is working on improving its compliance, enforcement and inspection processes to specifically target and address non-compliant public water systems. Ohio anticipates implementation of the program improvements will eventually increase public water system compliance. However, it will take time to see the benefits of the improvements.

### **Listing of Maximum Contaminant Level and Treatment Technique Violations**

Appendix B contains a listing of all violation types related to the MCL and TT regulation categories. The listing is ordered by water system identification number and violation date. Violation type or contaminant codes associated with the violations are defined in the Appendix A Compliance Summary Table. Included in the violation listing are enforcement action type codes (e.g. A, E, G, etc) associated with each violation. These are the particular actions the State of Ohio took to address each violation with the water system. Table 6 describes the enforcement action type codes used in Appendix B. Not all violations are required to have a compliance achieved enforcement action type code associated with them when a public water system has returned to compliance. In particular, the total coliform (code 3100) MCL violations listed do not have the returned to compliance enforcement code associated violations while almost all systems have returned to compliance. A return to compliance for these violations is

determined by lack of subsequent on-going violations.

**Table 7. Enforcement Action Type Code Descriptions**

Enforcement Action Type Code	Description
A	Notice of Violation Letter sent to Public Water System
C	Technical Assistance Visit, Meeting, or Investigation
E	Request for System to Public Notice
F	Public Notice received from Public Water System
G	Ohio EPA News Release (Public Notice)
H	Boil Water Order
J	Division, Notice of Violation Warning Letter
K	Bilateral Compliance Agreement Signed
L	Administrative Order without penalty
O	Administrative Order with penalty
Q	Civil Case Filed
R	State Consent Decree or Consent Judgement
X	Compliance Achieved
9	Civil Case Referred to Attorney Generals Office

A list of violations can also be viewed using the Internet at U.S. EPA's site known as "Envirofacts". This Internet site provides access to a subset of data available from U.S. EPA's Safe Drinking Water Information System (SDWIS). Using the Envirofacts website allows the user to select by state, county, public system name, public water system identification number and population size to obtain general facility information and violation information for public water systems in Ohio. The Internet address for this Envirofacts site is [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

### Summary and Report Availability & Contact Information

Ohio EPA will provide copies of the 2004 Annual Compliance Report to U.S.EPA, as well as post the report on the Division's web page at <http://www.epa.state.oh.us/ddagw/annualreports.html>. Copies of the 2004 annual report may also be obtained by writing to the State of Ohio at: PWS Annual Compliance Report, Ohio EPA - DDAGW, P.O. Box 1049, Columbus, OH 43216-1049.

In compliance with U.S. EPA's requirements, Ohio EPA will also notify the public of the availability of a

summary of the 2004 annual report through the Drinking Water Advisory Committee, the Division of Drinking and Ground Waters rule list serve, and by making the summary available on the Division of Drinking Waters web site.

For further information concerning this report, you may contact Rick Magni or Beth Messer with the Ohio EPA Division of Drinking and Ground Waters at (614) 644-2752. If you have questions concerning the specific violations associated with individual water systems, contact your local Ohio EPA District Office in your region.

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**APPENDIX A:**

**COMPLIANCE SUMMARY TABLE**

**APPENDIX B:**

**MCL and TT VIOLATION LISTING**