North Carolina's Annual Public Water Systems Compliance Report For the Calendar Year 2022

The Drinking Water Program: An Overview

The 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 Amendments, 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) and the Maximum Residual Disinfectant Levels (MRDLs). For some regulations, EPA establishes treatment techniques in lieu of an MCL to control unacceptable levels of contaminants in water. The Agency also regulates how often public water systems (PWSs) 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 (M/R) requirements. In addition, EPA requires PWSs to monitor for unregulated contaminants to provide data for future regulatory development. Finally, EPA requires PWSs to notify their consumers when they have violated these regulations. The 1996 Amendments to the SDWA require consumer notification to include a clear and understandable explanation of the nature of the violation, its potential adverse health effects, steps that the PWS is undertaking to correct the violation and the possibility of alternative water supplies during the violation.
The SDWA applies to the 50 states, the District of Columbia, Indian Lands, Puerto Rico, the Virgin Islands, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands.

The SDWA allows states, tribes and territories to seek EPA approval to administer their own PWSS Programs. The authority to run a PWSS Program is called primacy. For a state to receive primacy, EPA must determine that the state meets certain requirements laid out in the SDWA and the federal regulations, including the adoption of drinking water regulations that are at least as stringent as the federal regulations and a demonstration that they can enforce the program requirements. Of the 56 states and territories, all but Wyoming and the District of Columbia have primacy. The EPA regional offices administer the PWSS programs within these two jurisdictions.

The 1986 SDWA Amendments gave Indian tribes the right to apply for and receive primacy. EPA currently administers PWSS programs on all Indian lands except the Navajo Nation, which was granted primacy in late 2000.

Annual State PWS Report

Each quarter, primacy agencies submit data to the Safe Drinking Water Information System (SDWIS/FED), an automated database maintained by EPA. The data submitted include, but are not limited to, PWS inventory information, the incidence of MCL, MRDL, monitoring and reporting, and treatment technique violations and information on enforcement activity related to these violations. Section 1414(c)(3) of the SDWA requires states to provide EPA with an annual report of violations of the primary drinking water standards. This report provides the numbers of violations in each of six categories: MCLs, MRDLs, treatment techniques, variances and exemptions, significant monitoring and reporting, and significant

consumer notification. The EPA regional offices report the information for Wyoming, the District of Columbia, and all Indian lands but the Navajo Nation. EPA regional offices also report federal enforcement actions taken. Data retrieved from SDWIS/FED form the basis of this report.

Public Water System

A PWS 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 PWSs. PWSs can be community systems (such as towns), non-transient non-community systems (such as schools or factories), or transient non-community systems (such as rest stops or parks). For this report, when the acronym PWS is used, it means systems of all types unless specified in greater detail.

Maximum Contaminant Level

Under the SDWA, 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.

Maximum Residual Disinfectant Level

EPA sets national limits on residual disinfectant levels in drinking water to reduce the risk of exposure to disinfectant byproducts formed when public water systems add chemical disinfectant for either primary or residual treatment. These limits are known as Maximum Residual Disinfectant Levels (MRDLs).

Treatment Techniques

For some regulations, EPA establishes treatment techniques in lieu of an MCL to control unacceptable levels of certain contaminants. For example, treatment techniques have been established for viruses, some bacteria, and turbidity.

Variances and Exemptions

A primacy state can grant a PWS a variance from a primary drinking water regulation if the characteristics of the raw water sources reasonably available to the PWS do not allow the system to meet the MCL. To obtain a variance, the system must agree to install the best available technology, treatment techniques, or other means of limiting drinking water contamination that the Administrator finds are available (taking costs into account), and the state must find that the variance will not result in an unreasonable risk to public health. The variance shall be reviewed not less than every 5 years to determine if the system remains eligible for the variance.

A primacy state can grant an exemption temporarily relieving a PWS of its obligation to comply with an MCL or treatment technique or both if the system’s noncompliance results from compelling factors (which may include economic factors) and the system was in operation on the

effective date of the MCL or treatment technique requirement. The state will require the PWS to comply with the MCL or treatment technique as expeditiously as practicable, but not later than 3 years after the otherwise applicable compliance date.

Monitoring and Reporting

A PWS is required to monitor and verify that the levels of contaminants present in the water do not exceed the MCL or MRDL. If a PWS fails to have its water tested as required or fails to report test results correctly to the primacy agent, a monitoring and reporting violation occurs.

Significant Monitoring and Reporting Violations

For this report, significant monitoring and reporting violations are generally defined as any significant monitoring violation that occurred during the calendar year of the report. A significant monitoring and reporting violation, with rare exceptions, occurs when no samples were taken or no results were reported during a compliance period.

Consumer Notification

Every community water system is required to deliver to its customers a brief annual water quality report. 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

For this report, a significant consumer notification violation occurred if a community water system completely failed to provide its customers the required annual water quality report.

Public Notification Violations

The Public Notification Rule requires all PWSs to notify their consumers any time a PWS violated a national primary drinking water regulation or has a situation posing a risk to public health. The time period that a PWS has to notify the public depends upon the risk posed by the violation or situation. Notices must be provided to persons served (not just billing consumers).

Significant Public Notification Violations

For this report, significant public notification violation occurs when a PWS completely fails to notify its consumers that the PWS violated a national primary drinking water regulation or had a situation posing a risk to public health.

OBTAINING COPY OF 2022 PUBLIC WATER SYSTEMS REPORT

As required by the Safe Drinking Water Act the State of North Carolina has made the 2022 Public Water Systems report available to public. Interested individuals can obtain a copy of the 2022 Annual Public Water Systems Report for North Carolina by accessing our website at https://www.deq.nc.gov/2022-annual-compliance-report/open or they can contact Andrew Jarman by phone at 919-707-9061, by email at Andrew.Jarman@deq.nc.gov, or by mail at NCDEQ, Public Water Supply Section, 1634 Mail Service Center, Raleigh, NC 27699-1634.

Table of Violation Summaries for 2022

Violation Category	Rule Name	Number of Violations	Number of Resolved Violations	Number of Public Water Systems (PWS) in Violation
Maximum Contaminant Level Violation	Arsenic	7	4	3
Maximum Contaminant Level Violation	Nitrates	3	3	3
Maximum Contaminant Level Violation	Radionuclides	14	1	7
Maximum Contaminant Level Violation	Stage 2 Disinfectants and Disinfection Byproducts Rule	25	13	11
Maximum Contaminant Level Violation	Revised Total Coliform Rule	11	11	11
Total Maximum Contaminant Level Violations		**60**	**32**	**35**
Monitoring Violation	Revised Total Coliform Rule	458	400	325
Monitoring and Reporting	Arsenic	25	4	18
Monitoring and Reporting	Inorganic Chemicals	326	50	78
Monitoring and Reporting	Lead and Copper Rule	527	231	381

Violation Category	Rule Name	Number of Violations	Number of Resolved Violations	Number of Public Water Systems (PWS) in Violation
Monitoring and Reporting	Nitrates	109	53	91
Monitoring and Reporting	Radionuclides	55	5	12
Monitoring and Reporting	Synthetic Organic Chemicals	1392	429	62
Monitoring and Reporting	Volatile Organic Chemicals	717	275	26
Monitoring and Reporting	Stage 1 Disinfectants and Disinfection Byproducts Rule	95	87	85
Monitoring and Reporting	Stage 2 Disinfectants and Disinfection Byproducts Rule	158	73	87
Monitoring and Reporting	Ground Water Rule	82	3	76
Monitoring and Reporting	Long Term 1 Enhanced Surface Water Treatment Rule	3	3	2
Monitoring and Reporting	Total Coliform Rule	10	0	6
Total Monitoring and Reporting Violations		**3957**	**1613**	**1249**
Other Violation	Ground Water Rule	1	0	1
Other Violation	Consumer Confidence Rule	171	137	126
Other Violation	Public Notice Rule	567	164	262
Total Other Violations		**739**	**301**	**389**

Violation Category	Rule Name	Number of Violations	Number of Resolved Violations	Number of Public Water Systems (PWS) in Violation
Treatment Technique Violation	Lead and Copper Rule	12	10	11
Treatment Technique Violation	Stage 1 Disinfectants and Disinfection Byproducts Rule	6	4	5
Treatment Technique Violation	Long Term 1 Enhanced Surface Water Treatment Rule	2	2	2
Treatment Technique Violation	Long Term 2 Enhanced Surface Water Treatment Rule	1	1	1
Treatment Technique Violation	Revised Total Coliform Rule	29	21	26
Total Treatment Technique Violations		**50**	**38**	**45**

Definitions for Violation Table

Disinfectants and Disinfection Byproducts Rule (DBP), Stage 1 DBP, and Stage 2 DBP: This rule focuses on public health protection by limiting exposure to disinfection byproducts, specifically total trihalomethanes (TTHM) and five haloacetic acids (HAA5), which can form in water through disinfectants used to control microbial pathogens [40 CFR 141 Subparts L, U and V].

Ground Water Rule (GWR): The purpose of the rule is to reduce disease incidence associated with disease-causing microorganisms in drinking water. The rule establishes a risk-based approach to target ground water systems that are vulnerable to fecal contamination. Ground water systems that are identified as being at risk of fecal contamination must take corrective action to reduce potential illness from exposure to microbial pathogens. The rule applies to all systems that use ground water as a source of drinking water. [40 CFR 141, Subpart S]

Inorganic Chemicals (IOCs): 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 action limits for lead and copper in drinking water [40 CFR 141.80-91]. Lead and copper corrosion can pose various health risks when ingested and can enter drinking water from household pipes and plumbing fixtures. States report violations of the Lead and Copper Rule in the following categories:

- *Initial lead and copper tap monitoring/reporting (M/R):* SDWIS Violation Code 51 - The system did not meet initial lead (Pb) and copper (Cu) testing requirements or failed to report the results of those tests to the State.
- *Follow-up or routine lead and copper tap M/R:* SDWIS Violation Code 52 - The system did not meet follow-up or routine lead and copper tap testing requirements or failed to report the results.
- *Water Quality Parameter M/R:* SDWIS Violation Code 53 - Failure to monitor for Water Quality Parameters. Water Quality Parameters include pH, alkalinity, orthophosphate, silica, calcium, conductivity and water temperature.
- *Source Water Treatment M/R:* SDWIS Violation Code 56 - Failure to monitor the source water for lead and copper when the system fails to meet the lead or copper action level based on their tap water monitoring results.
- *Optimal Corrosion Control Treatment/Source Water Treatment (OCCT/SOWT) Recommendation/Study (TT):* SDWIS Violation Code 57 - Failure to perform a study and submit a recommendation for corrosion control treatment that minimizes the lead and copper concentrations at user's taps while ensuring that the treatment does not cause the water system to violate any national primary drinking water regulations.
- *OCCT/SOWT install demonstration (treatment installation) TT*: SDWIS Violation Code 58 - Failure to install corrosion control treatment.
- *Public education*: SDWIS Violation Code 65 (TT) - The system did not provide required public education about lead in drinking water.

Maximum Contaminant Level (MCL): The maximum permissible level of a contaminant in water which is delivered to any user of a public water system. MCLs are usually denoted in milligrams per liter (parts per million).

Maximum Residual Disinfectant Level (MRDL): A 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.

Monitoring/Reporting (M/R): EPA specifies which water testing methods the water systems must use and sets schedules for the frequency of testing and reporting. A water system that does not follow EPA's schedule or methodology is in violation [40 CFR 141]. Note: States must report monitoring violations that are significant as determined by the EPA Administrator and 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 90% of the required samples are not taken or results are not reported during the compliance period.

Number of Resolved Violations: Represents a count of the number of violations that have Returned to Compliance (RTC'd) during the calendar year. The violation has been linked to an enforcement action (SOX, EOX, ETX, or ESX).

Number of PWS in Violation: Represents a count of the number of systems that have violations for the specific contaminant/rule occurring during the calendar year of the report that have NOT returned to compliance (RTC'd). The violation has not been linked to an enforcement action (SOX, EOX, ETX, or ESX).

Number of Violations: Represents a count of the number of violations for the specific contaminant/rule occurring during the calendar year of the report that have NOT returned to compliance (RTC'd). The violation has not been linked to an enforcement action (SOX, EOX, ETX, or ESX).

Organic Chemicals: Carbon-based compounds, such as industrial solvents and pesticides. These contaminants, classified as either Synthetic Organic Chemicals (SOCs) or Volatile Organic Chemicals (VOCs), generally get into water through runoff from cropland or discharge from factories.

Public Notification (PN) rule: Each owner or operator of a PWS must give notice for all violations of national primary drinking water regulations (NPDWR) in accordance with 40 CFR 141, Subparts Q.

Radionuclides: Radioactive particles which can occur naturally in water or result from human activity. EPA has set legal limits on combined radium-226 and radium-228, uranium, gross alpha, and beta particle/photon radioactivity. Violations for these contaminants are to be reported using the following four categories:

- Gross alpha: SDWIS Contaminant Code 4000 for alpha radiation. Gross alpha includes radium-226 but excludes radon and uranium.
- *Uranium:* SDWIS Contaminant Code 4006 for uranium radiation.
- *Combined radium-226 and radium-228:* SDWIS Contaminant Code 4010 for combined radiation from these two isotopes.
- *Gross beta:* SDWIS Contaminant Code 4100 for gross beta particle activity from man-made radionuclides.

Revised Total Coliform Rule (40 CFR 141 Subpart Y): The Total Coliform Rule (TCR) was revised, and the final **Revised Total Coliform Rule (RTCR)** became effective on April 15, 2013, with the compliance date for the Rule's requirements set as April 1, 2016. The State reports acute MCL violations, treatment technique violations, monitoring, and reporting violations under the RTCR.

- *Acute MCL violation:* SDWIS Violation Code 1A - The system found fecal coliform or *E. coli*, potentially harmful bacteria, in its water, thereby violating the rule.
- *Treatment Technique Violation:* SDWIS Violation Codes 2A, 2B, and 2C, respectively, indicate that a system failed to perform a Level 1 Assessment, Level 2 Assessment, or Seasonal Start-up Procedure.
- *Major routine monitoring violation:* SDWIS Violation Codes 3A and 3B, respectively, indicate that a system did not perform proper routine or additional routine monitoring.

- **Total Coliform Rule (TCR):** The Total Coliform Rule established regulations for microbiological contaminants in drinking water. The rule was replaced by the Revised Total Coliform Rule on April 1, 2016. Microbiological contaminants can cause short-term health problems. If no samples are collected during the monthly or quarterly compliance period, a significant monitoring violation occurs. The non-acute MCL violation under the TCR has been replaced in the RTCR with the requirement to perform an assessment of the water system to find the potential cause of the coliform-positive samples. The failure to perform the assessment is a treatment technique violation under the RTCR. States are to report four categories of violations:
  - *Acute MCL violation:* SDWIS Violation Code 21- The system found fecal coliform or *E. coli*, potentially harmful bacteria, in its water, thereby violating the rule.
  - *Non-acute MCL violation:* SDWIS Violation Code 22 - 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, if more than 5% of the samples are positive for total coliform, it is a violation.
  - *Major routine and major repeat monitoring:* SDWIS Violation Codes 23 AND 25, respectively, indicate that a system did not perform proper routine or repeat monitoring.

SDWIS Code: Specific numeric codes from the Safe Drinking Water Information System (SDWIS) have been assigned to each violation type included in this report. The violations to be reported include exceeding contaminant MCLs, failure to comply with treatment requirements, and failure to meet monitoring and reporting requirements. Four- digit SDWIS Contaminant Codes have also been included in the chart for specific MCL contaminants.

Surface Water Treatment Rule (SWTR) and Long Term 1 Enhanced SWTR (LT1 ESWTR): The Surface Water Treatment Rule 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, Subparts H, P, T and W].

Treatment Techniques (TT): Treatment requirements that EPA established in lieu of an MCL to control unacceptable levels of certain contaminants. Failure to meet operational and system requirements under the Surface Water Treatment Rule, Groundwater Rule, and the Lead and Copper Rule have been included in this category of violations in this report. Failure to perform a required assessment under the RTCR is also included in this violation category.

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

Inventory Information

The information in the table above is based on data retrieved through the Annual Compliance Report (ACR) function from the EPA SDWIS/FED Reporting Services. North Carolina supplies information on its PWSs and their violations to EPA. This information is then uploaded into SDWIS/FED Data Warehouse (SFDW), which is the drinking water database of record. The ACR extracts the violations for all the rules from SFDW. It is important that the methodology used to extract data is as consistent as possible among states such that national data can be meaningfully aggregated for analysis.

The Violation Table above does not contain all violation possibilities. Only certain violation types, per EPA's Annual Public Water Systems Compliance Report Instructions, are included in this report. In addition, only the violations from community, non-transient non-community (NTNC), and transient non-community systems are included in this report. At the time of this report, North Carolina had 1,995 active 'community' systems, 2,811 active 'transient non-community' systems, and 326 active 'non-transient non-community' systems.