



**State of Delaware  
Public Drinking Water  
Annual Compliance  
Report and Summary  
for 2017**



***DELAWARE HEALTH AND SOCIAL SERVICES***

***Division of Public Health***

## Acknowledgements

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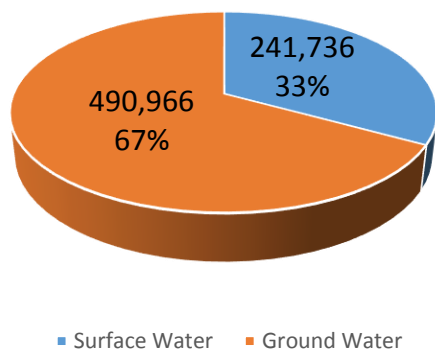
## Executive Summary

*The State of Delaware Public Drinking Water Annual Compliance Report and Summary for 2017* (ACR) covers the period of January 1 to December 31, 2017. It is provided by the Delaware Department of Health and Social Services, Division of Public Health (DPH), Office of Drinking Water (ODW) to the U.S. Environmental Protection Agency (EPA) and the public. Submission of this annual report is a mandatory EPA requirement.

Water systems in Delaware must provide safe drinking water to the public in accordance with the Safe Drinking Water Act (SDWA). The 2017 ACR gives the EPA and the public a descriptive overview of all public water systems in Delaware and their compliance status. The public can use this document as a quick reference to determine if the water system serving their household or business is in compliance or in violation of state and Federal regulations.

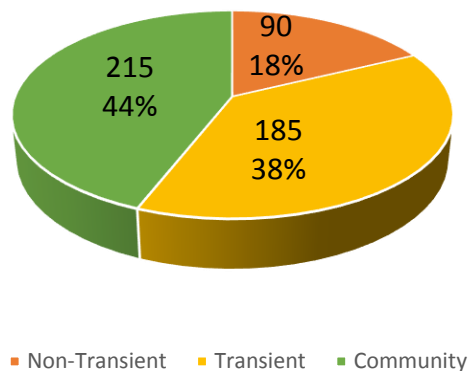
Delaware residents get their drinking water from either groundwater or surface water sources, depending on where they live. About two-thirds of Delaware households are connected to public water systems that use groundwater sources; the remaining one-third obtains water from surface water sources. The major sources of groundwater are the Columbia Aquifer, the Cheswold Aquifer, and the Piney Point Aquifer. All surface water plants for Delaware reside in northern New Castle County. The major sources of surface water are the Brandywine River Basin, Christiana River Basin, Red Clay Creek, and White Clay Creek.

**Figure 1. Population Served by Surface Water and Groundwater Systems, Delaware 2017**



*Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017*

**Figure 2. Types of Public Water Systems, Delaware, 2017**



*Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.*

Due to Delaware's small size, the ODW traditionally conducts most monitoring for public water systems. A few of the larger water systems conduct their own monitoring and report the results to ODW. Since monitoring requirements increased in recent years, ODW requires community water systems serving more than 1,000 people to collect their own total coliform, nitrate, and monthly fluoride compliance samples. Such community water systems (cities, towns, mobile home parks, etc.) must submit those samples to the Delaware Public Health Laboratory (DPHL) or a certified private laboratory for analysis, and then submit results to ODW. All community water systems and the non-transient, non-community water systems (schools, daycares, factories, etc.) are required to collect samples for compliance with national lead and copper rule standards. The samples are analyzed by a certified laboratory and the results are submitted to ODW. Transient, non-community water systems (restaurants, parks, rest stops, etc.) are not required to conduct lead and copper monitoring.

Forty-five Level 1 Assessments (a study of the water system after total coliform bacteria have been detected in the water system), and 13 Level 2 Assessments (a very detailed study of the water system after an *E. coli* Maximum Contaminant Level violation, and/or multiple occasions when total coliform bacteria have been found in the water system) were performed in 2017, nearly doubling the number of 2016 Assessments. The increase is due to a better understanding of the Revised Total Coliform Rule and better enforcement of it.

The total number of monitoring and reporting violations under the Lead and Copper Rule decreased from 17 in 2016 to nine in 2017. ODW credits improved communication with water systems about sampling deadlines for this positive outcome.

There were seven action level exceedances for lead and copper in 2017, compared to 11 in 2016. Water systems installed treatment or flush their system routinely to ensure lower levels of lead or copper.

The U.S. Congress adopted the SDWA in 1974. The EPA established the Public Water System Supervision (PWSS) program under the authority of the SDWA to regulate the drinking water provided by public water systems. Under the SDWA and its 1986 and 1996 amendments, the EPA set national limits on drinking water contaminant levels to ensure that water that is safe for human consumption. These limits are known as Maximum Contaminant Levels (MCLs). The State of Delaware adopted these limits for use in state regulations governing drinking water.

The SDWA allows a state to seek primacy, an EPA approval to administer its own PWSS program. The State of Delaware was granted primacy in April 1978. For Delaware to continue to receive primacy, it must meet certain SDWA requirements, including adopting drinking water regulations that are at least as stringent as the federal regulations. The State must also demonstrate that it can enforce the program requirements. DPH is the entity responsible for monitoring and enforcing drinking water regulations, and it does so through the ODW.

ODW staff generated the data in this report. Violation information was obtained from the Safe Drinking Water Information System/State (SDWIS/State) version and the federal operational data system, and includes information reported quarterly to the EPA. This report is also available on the ODW website: <http://www.dhss.delaware.gov/dhss/dph/hsp/pubdw.html>.

## State Public Drinking Water Summary, 2017

This document provides an overview of the state's public drinking water system for 2017. Its contents range from general information to violations by contaminant and by water system. For additional information or clarification, contact the Division of Public Health (DPH), Office of Drinking Water (ODW) at 302-741-8630.

<b>Figure 3. Population, Delaware, 2017</b>	
Population of Delaware	954,937
Percent served by individual wells	23.3%
Percent served by public water supplies	76.7%
Year primacy granted to state by EPA	1978

Source: Delaware Population Consortium, 2017

<b>Figure 4. Land Usage, Delaware, 2017</b>		
Total land area of Delaware	1,356,186 acres	
Forest/Forested Wetlands	370,430 acres	27%
Agriculture	500,159 acres	37%
Developed	278,804 acres	21%
Wetland/Water/Waterways	206,793 acres	15%

Source: Delaware Office of State Planning Coordination, 2017

<b>Figure 5. Public Water systems, Delaware, 2017</b>	
<b>Residents served by public water systems<sup>1</sup></b>	732,702
Residents served by surface water systems	241,736
Residents served by ground water systems	490,966
<b>Number of public water systems</b>	<b>490</b>
Community systems	215
Non-transient systems	90
Transient systems	185
Number using surface water	3
Number using ground water	487

<sup>1</sup> Safe Drinking Water Information System/State Version (SDWIS/State), Delaware Department of Health and Social Services, Division of Public Health, 2017.

<b>Figure 6. Drinking Water Sources, Delaware, 2017</b>
<b>Major Sources of Surface Water</b>
Brandywine River Basin
Christina River Basin
Red Clay/White Clay Creeks
<b>Major Sources of Ground Water</b>
Columbia Aquifer
Cheswold Aquifer
Piney Point Aquifer
Number of gallons of public water used in Delaware each day: 101 mgd <sup>2</sup>

<sup>2</sup> Million Gallons per Day.: Delaware Department of Natural Resources and Environmental Control, 2017.

## Definitions

**Community Water System:** a public water system that serves at least 15 service connections used by year-round residents, or regularly serves at least 25 year-round residents.

**Non-Transient Non-Community Water System:** a public water system other than a community water system that regularly serves at least 25 of the same persons over six months per year.

**Transient Non-Community Water System:** a public water system with at least 15 service connections or that regularly serves an average of at least 25 individuals daily at least 60 days of the year.

**Surface Water:** all water that is open to the atmosphere and subject to surface runoff.

**Groundwater:** all water held underground in the soil or pores and crevices in rocks.

**Figure 7. Summary of Violations, Delaware, 2017**

	MCL (mg/L) <sup>1</sup>	MCLs		Treatment Techniques		Significant Monitoring/ Reporting	
		Violations	Systems with Violations	Violations	Systems with Violations	Violations	Systems with Violations
<b>Organic Contaminants</b>							
1,1,1-Trichloroethane	0.2	0	0	N/A	N/A	0	0
1,1,2-Trichloroethane	.005	0	0	N/A	N/A	0	0
1,1-Dichloroethylene	0.007	0	0	N/A	N/A	0	0
1,2,4-Trichlorobenzene	.07	0	0	N/A	N/A	0	0
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0	0	N/A	N/A	0	0
1,2-Dichloroethane	0.005	0	0	N/A	N/A	0	0
1,2-Dichloropropane	0.005	0	0	N/A	N/A	0	0
2,3,7,8-TCDD (Dioxin)	3x10 <sup>-8</sup>	0	0	N/A	N/A	0	0
2,4,5-TP	0.05	0	0	N/A	N/A	0	0
2,4-D	0.07	0	0	N/A	N/A	0	0
Acrylamide	N/A	N/A	N/A	0	0	N/A	N/A
Alachlor	0.002	0	0	N/A	N/A	0	0
Atrazine	0.003	0	0	N/A	N/A	0	0
Benzene	0.005	0	0	N/A	N/A	0	0
Benzo[a]pyrene	0.0002	0	0	N/A	N/A	0	0
Carbofuran	0.04	0	0	N/A	N/A	0	0
Carbon tetrachloride	0.005	0	0	N/A	N/A	0	0
Chlordane	0.002	0	0	N/A	N/A	0	0
cis-1,2-Dichloroethylene	0.07	0	0	N/A	N/A	0	0
Dalapon	0.2	0	0	N/A	N/A	0	0
Di(2-ethylhexyl) adipate	0.4	0	0	N/A	N/A	0	0
Di(2-ethylhexyl)phthalate	0.006	0	0	N/A	N/A	0	0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017

<sup>1</sup> Values are in milligrams per liter (mg/L), unless otherwise specified.



**Figure 7. Summary of Violations, Delaware, 2017** (continued)

	MCL (mg/L) <sup>1</sup>	MCLs		Treatment Techniques		Significant Monitoring/ Reporting	
		Violations	Systems with Violations	Violations	Systems with Violations	Violations	Systems with Violations
<b>Organic Contaminants</b>							
Dichloromethane	0.005	0	0	N/A	N/A	0	0
Dinoseb	0.007	0	0	N/A	N/A	0	0
Diquat	0.02	0	0	N/A	N/A	0	0
Endothall	0.1	0	0	N/A	N/A	0	0
Endrin	0.002	0	0	N/A	N/A	0	0
Epichlorohydrin	N/A	N/A	N/A	0	0	N/A	N/A
Ethylbenzene	0.7	0	0	N/A	N/A	0	0
Ethylene dibromide	0.00005	0	0	N/A	N/A	0	0
Glyphosate	0.7	0	0	N/A	N/A	0	0
Heptachlor	0.0004	0	0	N/A	N/A	0	0
Heptachlor epoxide	0.0002	0	0	N/A	N/A	0	0
Hexachlorobenzene	0.001	0	0	N/A	N/A	0	0
Hexachlorocyclopent adiene	0.05	0	0	N/A	N/A	0	0
Lindane	0.0002	0	0	N/A	N/A	0	0
Methoxychlor	0.04	0	0	N/A	N/A	0	0
Methyl tert-Butyl Ether (MTBE)	0.01	0	0	N/A	N/A	0	0
Monochlorobenzene	0.1	0	0	N/A	N/A	0	0
o-Dichlorobenzene	0.6	0	0	N/A	N/A	0	0
Oxamyl (Vydate)	0.2	0	0	N/A	N/A	0	0
para- Dichlorobenzene	0.075	0	0	N/A	N/A	0	0
Pentachlorophenol	0.001	0	0	N/A	N/A	0	0
Picloram	0.5	0	0	N/A	N/A	0	0
Simazine	0.004	0	0	N/A	N/A	0	0
Styrene	0.1	0	0	N/A	N/A	0	0
Tetrachloroethylene	0.005	0	0	N/A	N/A	0	0
Toluene	1	0	0	N/A	N/A	0	0
Total polychlorinated biphenyls (PCBs)	0.0005	0	0	N/A	N/A	0	0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017

<sup>1</sup> Values are in milligrams per liter (mg/L), unless otherwise specified.

**Figure 7. Summary of Violations, Delaware 2017** (continued)

	MCL (mg/L) <sup>1</sup>	MCLs		Treatment Techniques		Significant Monitoring/ Reporting	
		Violations	Systems with Violations	Violations	Systems with Violations	Violations	Systems with Violations
<b>Organic Contaminants</b>							
Toxaphene	0.003	0	0	N/A	N/A	0	0
trans-1,2-Dichloroethylene	0.1	0	0	N/A	N/A	0	0
Trichloroethylene	0.005	0	0	N/A	N/A	0	0
Vinyl chloride	0.002	0	0	N/A	N/A	0	0
Xylenes (total)	10	0	0	N/A	N/A	0	0
<b>Subtotal</b>		<b>0</b>	<b>0</b>	<b>N/A</b>	<b>N/A</b>	<b>0</b>	<b>0</b>
<b>Disinfection Byproducts</b>							
Total trihalomethanes	0.08	0	0	N/A	N/A	0	0
Haloacetic Acid 5	0.06	0	0	N/A	N/A	0	0
Maximum Residual Disinfection Level	4.0	0	0	N/A	N/A	0	0
<b>Subtotal</b>		<b>0</b>	<b>0</b>	<b>N/A</b>	<b>N/A</b>	<b>0</b>	<b>0</b>
<b>Inorganic Contaminants</b>							
Antimony	0.006	0	0	N/A	N/A	0	0
Arsenic	0.05	0	0	N/A	N/A	0	0
Asbestos	7 million fibers/L, with fiber length >10 microns	0	0	N/A	N/A	0	0
Barium	2	0	0	N/A	N/A	0	0
Beryllium	0.004	0	0	N/A	N/A	0	0
Cadmium	0.005	0	0	N/A	N/A	0	0
Chromium	0.1	0	0	N/A	N/A	0	0
Cyanide (as free cyanide)	0.2	0	0	N/A	N/A	0	0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017

<sup>1</sup> Values are in milligrams per liter (mg/L), unless otherwise specified.

**Figure 7. Summary of Violations, Delaware, 2017** (continued)

<b>Inorganic MCLs</b>							
	<b>MCL (mg/L)<sup>1</sup></b>	<b>MCLs</b>		<b>Treatment Techniques</b>		<b>Significant Monitoring/Reporting</b>	
		Violations	Systems with Violations	Violations	Systems with Violations	Violations	Systems with Violations
Fluoride	2.0	0	0	N/A	N/A	0	0
Mercury	0.002	0	0	N/A	N/A	0	0
Nitrate	10 (as Nitrogen)	6	5	N/A	N/A	0	0
Nitrite	1 (as Nitrogen)	0	0	N/A	N/A	0	0
Selenium	0.05	0	0	N/A	N/A	0	0
Thallium	0.002	0	0	N/A	N/A	0	0
Total nitrate and nitrite	10 (as Nitrogen)	0	0	N/A	N/A	0	0
<b>Subtotal</b>		<b>6</b>	<b>5</b>	<b>N/A</b>	<b>N/A</b>	<b>0</b>	<b>0</b>
<b>Radionuclide MCLs</b>							
Gross alpha	15 pCi/l	0	0	N/A	N/A	0	0
Radium-226 and radium-228	5 pCi/l	0	0	N/A	N/A	0	0
Gross beta	4 mrem/yr	0	0	N/A	N/A	0	0
<b>Subtotal</b>		<b>0</b>	<b>0</b>	<b>N/A</b>	<b>N/A</b>	<b>0</b>	<b>0</b>
<b>Revised Total Coliform Rule</b>							
Acute MCL violation	Presence with <i>E. coli</i>	5	4	N/A	N/A	0	0
Level 1 Assessment	Presence	45	43	N/A	N/A	0	0
Level 2 Assessment	Presence w/ <i>E. coli</i>	13	12	N/A	N/A	0	0
Sanitary survey	N/A	N/A	N/A	N/A	N/A	0	0
<b>Subtotal</b>		<b>63</b>	<b>59</b>	<b>N/A</b>	<b>N/A</b>	<b>0</b>	<b>0</b>

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017

<sup>1</sup> Values are in milligrams per liter (mg/L), unless otherwise specified.

**Figure 7. Summary of Violations, Delaware, 2017** (continued)

	MCL (mg/L) <sup>1</sup>	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
		Violations	Systems with Violations	Violations	Systems with Violations	Violations	Systems with Violations
<b>Surface Water Treatment Rule</b>							
Filtered systems	N/A	N/A	N/A	0	0	N/A	N/A
Monitoring, routine/repeat	N/A	N/A	N/A	N/A	N/A	0	0
Treatment techniques	N/A	N/A	N/A	0	0	N/A	N/A
Turbidity	N/A	N/A	N/A	N/A	N/A	0	0
Monitoring, routine/repeat	N/A	N/A	N/A	N/A	N/A	0	0
Failure to filter	N/A	N/A	N/A	0	0	N/A	N/A
<b>Subtotal</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Lead and Copper Rule</b>							
<b>Lead and Copper Rule</b>	Action Level (mg/L)	Exceedance	Systems with Exceedance	Violations	Systems with violations	Violations	Systems with Violations
Initial lead and copper tap M/R	N/A	0	0	N/A	N/A	9	9
Follow-up or routine lead and copper tap M/R	N/A	6	5	N/A	N/A	0	0
Treatment installation	N/A	0	0	0	0	N/A	N/A
Public education	N/A	N/A	N/A	0	0	N/A	N/A
<b>Subtotal</b>	<b>N/A</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>17</b>
<b>Public Notification</b>		<b>Violations</b>		<b>N/A</b>	<b>Systems with Violations</b>		
Consumer Confidence Reports Violations		29		N/A	29		
Public Notification		0		N/A	0		
Ground Water Rule		0		N/A	0		
<b>Subtotal</b>		<b>29</b>		<b>N/A</b>	<b>29</b>		

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017

<sup>1</sup> Values are in milligrams per liter (mg/L), unless otherwise specified.

## Definitions for Summary of 2017 Violations

**Filtered Systems:** Surface water systems that have installed filtration treatment [[40 CFR 141, Subpart H](#)].

**Inorganic Contaminants (IOC):** 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:** 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. States report violations of the lead and copper rule in the following five categories:

1. *Initial lead and copper tap monitoring/reporting:* A violation in which a system did not meet initial lead and copper testing requirements, or failed to report the results of those tests to the state.
2. *Follow-up or routine lead and copper tap monitoring/reporting:* A violation in which a system did not meet follow-up or routine lead and copper tap testing requirements, or failed to report the results.
3. *Treatment installation:* Violations for a failure to install an optimal corrosion control treatment system or source water treatment system that would reduce lead and copper levels in water at the tap.
4. *Lead service line replacement:* A violation for a system's failure to replace lead service lines on the schedule required by the regulation.
5. *Public education:* A violation in which a system did not provide required public education about reducing or avoiding lead intake from water.

**Maximum Contaminant Level (MCL):** The highest amount of a contaminant that EPA allows in drinking water. MCLs ensure that drinking water does not pose either a short-term or long-term health risk. MCLs are defined in milligrams per liter (mg/L; 1 mg/L = 1 part per million) unless otherwise specified.

**Monitoring:** The EPA specifies which water testing methods public water systems must use, and sets schedules for the frequency of testing. A public water system that does not follow the 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 the purposes of this report, significant monitoring violations are major violations that occur when compliance sampling is not conducted or when results are not reported during a compliance period. A major monitoring violation for the surface water treatment rule occurs when at least 90 percent of the required compliance samples are not taken, or the results are not reported, during the compliance

period. Further enforcement actions, including administrative orders and penalties, may be taken for continued non-compliance. (See Enforcement Actions.)

**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:** When a system issues a public notice and notifies the Division of Public Health that the notice was delivered.

**Radionuclides:** Radioactive particles that can occur naturally in water or result from human activity. EPA has set legal limits on five types of radionuclides: radium-226, radium-228, gross alpha, beta particle/photon radioactivity, and uranium [[40 CFR 141](#)]. Violations for these contaminants are to be reported using the following four categories:

1. *Gross alpha:* A violation for alpha radiation above MCL of 15 picocuries/liter. Gross alpha includes radium-226 but excludes radon and uranium.
2. *Combined radium-226 and radium-228:* A violation for combined radiation from these two isotopes above MCL of 5 pCi/L.
3. *Gross beta:* A violation for beta particle and photon radioactivity from man-made radionuclides above 4 millirem/year.
4. *Uranium:* A violation for uranium is above 30 micrograms/liter ( $\mu\text{g/L}$ ;  $1 \mu\text{g/L} = 1$  part per billion)

**Reporting Interval:** The reporting interval for violations to be included in this Public Water System Annual Compliance Report is from January 1, 2016 through December 31, 2017.

**Revised Total Coliform Rule (RTCR):** Establishes an MCL for *E. coli* and uses the presence of *E. coli* and total coliform bacteria to initiate a “find and fix” approach to address fecal contamination that could enter the distribution system.

It requires public water systems to perform assessments to identify sanitary defects and subsequently take action to correct them:

- *Level 1 Assessment:* A Level 1 Assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been detected in the water system. For systems collecting fewer than 40 samples per month, more than one positive sample for total coliform triggers an assessment. For systems collecting 40 or more samples per month, more than 5 percent of the samples positive for total coliform triggers an assessment.

## Definitions for Summary of 2017 Violations *(continued)*

- *Level 2 Assessment:* A Level 2 Assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in the water system on multiple occasions. Level 2 Assessments are conducted when a water system has detected *E. coli* in its water, or if the system triggers two Level 1 Assessments in a rolling 12-month period.

Four classifications of violations are issued under the purview of the RTCR:

- *E. coli* MCL Violation: Issued when the presence of *E. coli* is confirmed.
- Treatment Technique (TT) Violation: Issued when a water system fails to conduct a required process intended to reduce the level of a contaminant in drinking water. Non-compliance is based on the failure to take any of the following actions:
  - Failure To conduct a Level 1 or Level 2 Assessment within 30 days of learning of the Assessment trigger
  - Failure to correct sanitary defects from a Level 1 or Level 2 Assessment within 30 days of learning of the Assessment trigger
  - Failure of a seasonal water system to complete the state-approved start-up procedure prior to serving water to the public
- Monitoring Violations: Issued to a system that fails to conduct routine or repeat monitoring, including:
  - Failure to take routine total coliform sample(s)
  - Failure to analyze for *E. coli* following a total coliform positive sample
- Reporting Violations: Issued to a system that fails to report routine or repeat monitoring results, including:
  - Failure to submit a monitoring report
  - Failure to submit a completed Level 1 or Level 2 Assessment form within 30 days of learning of the Assessment trigger
  - Failure to notify ODW by the end of the next business day following an *E. coli*-positive sample or *E. coli* MCL violation
  - Failure for a seasonal water system to submit a certification of completion for the ODW-approved seasonal start-up procedure prior to serving water to the public

## Definitions for Summary of 2017 Violations *(continued)*

**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, Subpart H](#)]. Violations of the Surface Water Treatment Rule are to be reported for the following four categories:

1. *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.
2. *Treatment techniques (for filtered systems):* A violation for a system's failure to properly treat its water.
3. *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.
4. *Failure to filter (for unfiltered systems):* A violation for a system's failure to properly treat its water. EPA will supply data for this violation code to the states.

**Treatment Techniques:** A water disinfection process that EPA requires instead of setting an MCL for contaminants that laboratories cannot adequately measure. Failure to meet other operational and system requirements under the surface water treatment and the lead and copper rules 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](#)]. There are no unfiltered systems in Delaware.

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



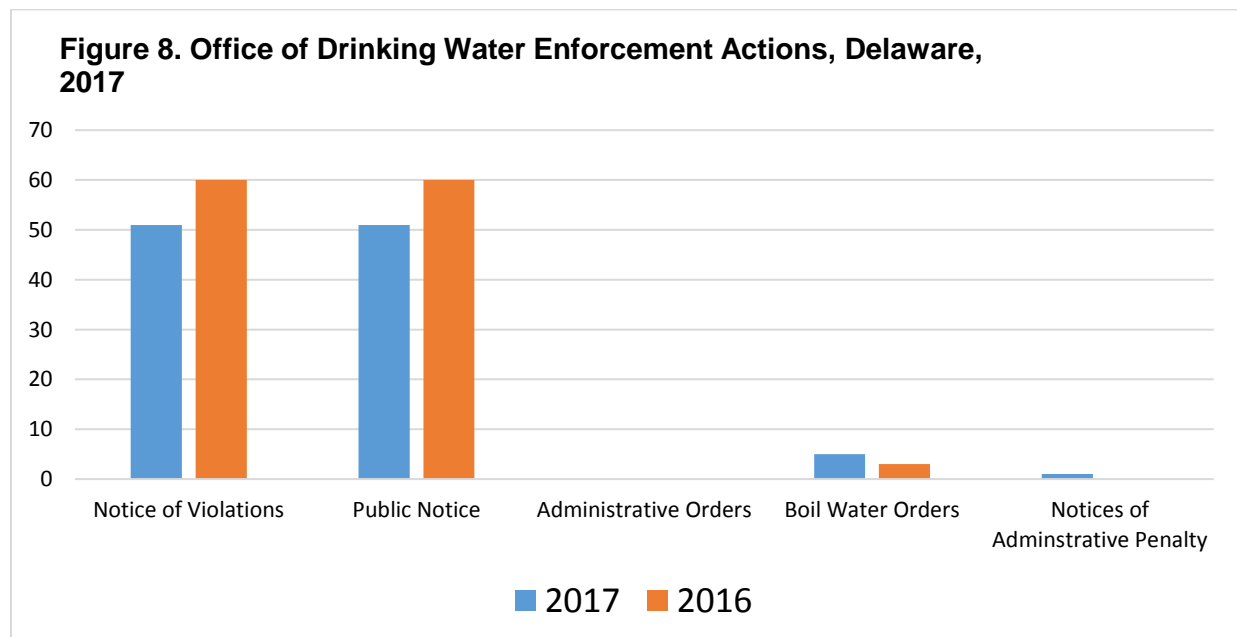
## 2017 Enforcement Actions

ODW takes enforcement actions when a public water system violates a MCL or treatment technique (TT), as specified in *State of Delaware Regulations Governing Public Drinking Water Systems*; or if a system fails to properly monitor and/or report a particular contaminant.

Issuing a Notice of Violation (NOV) is the first action taken. This notifies the owner/operator of a public water system that there was a violation. The next action is for the owner/operator to issue a public notice (PN). The owner/operator is required to mail, hand deliver, or post the PN in a conspicuous place. The public notice informs consumers of the water that there was a violation, what the violation was, possible related health effects, and preventive measures the consumer can take until the violation is corrected. A boil water notice is issued when a water system violates the *E. coli* MCL. This requires immediate notice (within 24 hours of being notified of the violation) to all consumers and includes instructions for what actions to take to make their water safe for consumption, or if they should use an alternate source such as bottled water.

Additional enforcement actions, used when a water system repeatedly violates an MCL or when a history of violations is present, are the issuance of an administrative order (AO) and a bilateral compliance agreement (BCA). The administrative order can mandate the installation of treatment or the abandonment of a well with persistent violations. A bilateral compliance agreement is a written contract between the system and ODW in which the violations, corrective steps, and the deadline for completing the work are established in writing and are enforceable.

If a public water system fails to correct a violation or continues to be unresponsive to DPH requirements, a Notice of Administrative Penalty may be issued. The administrative penalty can range from \$100/day to \$10,000/day per violation.



Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

## Data Management

ODW uses an Oracle®-based system to inventory water supplies, record sampling results, and track compliance with monitoring and MCL requirements. The Safe Drinking Water Information System (SDWIS) includes information about water supply facilities, water sources, treatment used, and sampling results. It includes information reported quarterly to the EPA.

ODW provides many services to consumers and public water supply systems. Funding comes from both state and federal monies allotted to Delaware's public drinking water program. ODW and the Delaware Public Health Laboratory (DPHL) use these funds to provide services for the drinking water program, including sample collection and analysis, technical assistance, and operator certification.

To ensure that Delaware's drinking water meets or exceeds Safe Drinking Water Act (SDWA) requirements, ODW reviews and approves plans for new or existing water treatment systems and/or new or upgraded distribution systems. ODW staff also inspects water systems, provides technical assistance, responds to emergencies, makes compliance determinations based on monitoring results, and takes enforcement actions when necessary. ODW provides training to water system operators and owners regarding system operation and compliance with rules and regulations. Additionally, ODW contracts with the Environmental Training Center at Delaware Technical Community College and the Delaware Rural Water Association to provide training and additional technical assistance to water system operators.

In January 2006, DPH began requiring individuals collecting compliance samples or conducting daily monitoring of a public water system to be a licensed operator or certified as an approved sampler/tester. This requirement helps to ensure the integrity of the sampling.

The DPHL performs water analyses for water quality parameters as outlined in the SDWA. ODW also contracts with private laboratories to analyze some regulated parameters.

<b>Figure 9. Operations of the Delaware Office of Drinking Water, 2017</b>	
Inspections	201
Plan Reviews	221

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<b>Figure 10. Budget Information (PWSS Grant), Delaware Office of Drinking Water, 2017</b>	
Total Budget	\$1,025,738
Federal Budget	\$549,000
State Budget	\$476,738
Number of Staff Authorized	15.75

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<b>Figure 11. Operator Certification, Delaware, 2017</b>	
	<b>Number</b>
Certified Operators	422
Approved Sampler/Testers	396

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

**Figure 12. Compliance Highlights, Public Water Systems, Delaware, 2017**

Compliance Area	Samples Collected	Systems In Compliance	% of State Served by Compliant Systems <sup>1</sup>	Systems not in Compliance	
				2016	2017
Bacteriological	9,899	490	100% (100%)	0	0
Bacteriological, Acute ( <i>E. coli</i> )	9,899	485	99.9% (98.9%)	3	5
Surface Water Treatment Rule <sup>2</sup>	N/A	3	100% (100%)	0	0
Nitrates	2,035	485	99.7% (98.9)	7	5
Fluoride	2,493	490	100% (100%)	0	0
Inorganic (IOC) Excluding Nitrate and Fluoride	1,901	490	100% (100%)	0	0
Volatile Organic Chemicals (VOC)	393	490	100% (100%)	0	0
Synthetic Organic Chemicals (SOC)	510	490	100% (100%)	0	0
Lead and Copper	1,172	484 <sup>2</sup>	99.9% (98.7%)	10	6
Lead and Copper/ M&R Violations	N/A	481	99.9% (98.1 %)	17	9
Consumer Confidence Rule – Failure to Report	N/A	461	99.1% (94.1%)	29	29
Consumer Confidence Rule – Inadequate Report	N/A	486	100% (100%)	2	4
Disinfection Byproducts (DBPs)	800	490	100% (100%)	0	0
Radiological	67	490	100% (100%)	0	0
Ground Water Rule	N/A	490	100% (100%)	0	0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<sup>1</sup> First percentage based on population served, second percentage based on total number of public water systems.

<sup>2</sup> Systems with no action level exceedance.

## Systems Out of Compliance

<b>Figure 13. Level 1 Assessments, Delaware, 2017</b>	
<b>System Name</b>	<b>Population Served</b>
Arby's – Lewes	675
Baltimore Aircoil - Milford	430
Bayshore Mobile Home Park – Ocean View	1,508
Bayside – Fenwick Island	1,000
Bethany Club Tennis – Ocean View	100
Blanton's Mobile Home Park - Cheswold	75
Broadkiln Beach water Company - Milford	480
Children Secret Garden - Dover	60
Country Center Girl Scout Camp - Hockessin	100
Country House – Winterthur – 1 <sup>st</sup> Assessment	425
Country House – Winterthur – 2 <sup>nd</sup> Assessment	425
Country View – Felton	84
DJ's Properties, LLC – Milton -	50
Dover Indoor Tennis – Dover	80
Dover Skating Center – Camden-Wyoming	500
Fisherman's Village – Bowers Beach	40
Flying Dutchman Mobile Home Park 2 – Felton	30
Granada Mobile Home Court – Magnolia – 1 <sup>st</sup> Assessment	138
Granada Mobile Home Court – Magnolia – 2 <sup>nd</sup> Assessment	138
Harrington Moose Lodge 534 – Harrington	25
Henlopen Acres, Town of – Rehoboth Beach	295
Hilltop Trailer Park – Rising Sun	135
Holiday Pines – Millsboro	60
Indian River Yacht Club – Millsboro	60
Jazzy Jay's Soul Food Café, LLC – Cheswold	25
Lewes Senior Citizens Center – Nassau	50
Long Neck Village – Millsboro	345
Magnolia Water Department – Magnolia	425
Milton Cheer, Inc. – Milton	63
Mountaire – Millsboro -	1,200
Northside Professional Center – Millsboro	30
Oak Grove Estates – Little Creek	150
Pine Haven Mobile Home Park and Campsite System #2 – Lincoln	132
Seaford Swimming Pool – Seaford	200
Shawn's Hideaway System #4 – Millsboro	60
Slaughter Beach Water I – Slaughter Beach	47
Smyrna Christian School & Church – Smyrna	67
South Wood Acres – Magnolia	534
Sports at the Beach System 2 – Georgetown	25
Sports at the Beach System 3 – Georgetown	25
Surf Bagel - Lewes	500
Tony J. Marchio Administrative Offices – Odessa	50
Treasure Beach Campground System 4 – Selbyville	699
Willow Tree Trailer and Mobile Home Park – Dover	141
Woods Edge Mobile Home Park – Camden-Wyoming	45
<i>Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.</i>	

<b>Figure 13. Level 1 Assessments, Delaware, 2017 (continued)</b>	
<b>Level 1 Assessment Totals</b>	
Number of Assessments	45
Number of Systems Affected	43
Number of Repeat Violators	2
Total Population at Risk	11,726

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<b>Figure 14. Level 2 Assessments, Delaware, 2017</b>	
<b>System Name</b>	<b>Population Served</b>
Anyo Properties	44
Anyo Properties	44
Bethany Club Tennis	100
Brumbley's Family Park	48
Discover Cover Learning Center	55
Dover Skating Center	500
Flying Dutchman Mobile Home Park 2	30
Holly Lake Campsite System 1	801
Indian River Yacht Club	60
Lewes Center	200
Long Neck Village	345
Stargate Diner	50
Woods Edge Mobile Home Park	45
<b>Level 2 Assessment Totals</b>	
Number of Assessments	13
Number of Systems Affected	12
Number of Repeat Violators	1
Total Population at Risk	2,322

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<b>Figure 15. Nitrate Violations, Delaware, 2017</b>		
<b>System Name</b>	<b>Population Served</b>	<b>Return to Compliance Date</b>
Forest Park	46	08/21/2017
Tall Pines Resort Community System 1	1,538	N/A
Pine Haven MHP and Campsite System #2	135	N/A
Shore Stop #256 Milford	150	05/07/2017
Taco's Chabelita	25	N/A
<b>Nitrate Violation Totals</b>		
Number of Violations	6	
Number of Systems Affected	5	
Number of Repeat Violators	0	
Total Population at Risk	1,894	

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<b>Figure 16. Radiological Compounds Violations, Delaware, 2017</b>				
<b>System Name</b>	<b>Population Served</b>	<b>Contaminant</b>	<b>MCL<sup>1</sup> in pCi/L<sup>2</sup></b>	<b>Level Found in pCi/L</b>
None	N/A	N/A	N/A	N/A
<b>Radiological Compounds Violation Totals</b>				
Number of Violations			0	
Number of Systems Affected			0	
Number of Repeat Violators			0	
Total Population at Risk			0	

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<sup>1</sup> MCL means Maximum Contaminant Level

<sup>2</sup> pCi/L means picocuries per liter

<b>Figure 17. Inorganic/Volatile/Synthetic Organic Compound Rule (IOC/VOC/SOC) Violations, Delaware, 2017</b>				
<b>System Name</b>	<b>Population Served</b>	<b>Contaminant</b>	<b>MCL<sup>1</sup> in mg/L<sup>2</sup></b>	<b>Level Found in mg/L</b>
None	N/A	N/A	N/A	N/A
<b>IOC/VOC/SOC Rule Violation Totals</b>				
Number of Violations			0	
Number of Systems Affected			0	
Number of Repeat Violators (Systems)			0	
Total Population at Risk			0	

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<sup>1</sup> MCL means Maximum Contaminant Level

<sup>2</sup> mg/L means milligrams per liter

<b>Figure 18. Disinfection Byproducts Rule (DPB) Violations, Delaware, 2017</b>				
<b>System Name</b>	<b>Population Served</b>	<b>Contaminant</b>	<b>MCL<sup>1</sup> in mg/L<sup>2</sup></b>	<b>Level Found in mg/L</b>
None	N/A	N/A	N/A	N/A
<b>Disinfection Byproducts Rule Violation Totals</b>				
Number of Violations			0	
Number of Systems Affected			0	
Number of Repeat Violators			0	
Total Population at Risk			0	

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<sup>1</sup>MCL means Maximum Contaminant Level

<sup>2</sup>mg/L means milligrams per liter

**Figure 19. Maximum Residual Disinfection Level (MRDL) Violations, Delaware, 2017**

System Name	Population Served	Contaminant	MRDL <sup>1</sup> in mg/L <sup>2</sup>	Level Found in mg/L
None	N/A	N/A	N/A	N/A
<b>Maximum Residual Disinfection Level Violation Totals</b>				
Number of Violations			0	
Number of Systems Affected			0	
Number of Repeat Violators			0	
Total Population at Risk			0	

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<sup>1</sup>MRDL means Maximum Residual Disinfectant Level

<sup>2</sup>mg/L means milligrams per liter

**Figure 20. Ground Water Rule Violations, Delaware, 2017**

System Name	Population	Return to Compliance Date
None	N/A	N/A
<b>Ground Water Rule Violation Totals</b>		
Number of Violations		0
Number of Systems Affected		0
Number of Repeat Violators		0
Total Population Affected		0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

**Figure 21. Surface Water Treatment Rule (Turbidity Violation), Delaware, 2017**

System Name	Population Served
None	N/A
<b>Surface Water Treatment Rule Violation Totals</b>	
Number of Violations	0
Number of System Affected	0
Number of Repeat Violators	0
Total Population Affected	0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.



**Figure 22. Lead and Copper Rule (LCR) Monitoring Violations, Delaware, 2017**  
*Systems that failed to collect the required number of samples including tap samples and/or water quality parameters during any monitoring period in 2016*

System Name	Population	Return to Compliance Date
Angola Crest II	159	N/A
Bethany Crest LLC	60	N/A
Country View MHP	84	N/A
Countryside Hamlet	66	N/A
Discovery Cove	55	N/A
Homestead Park	230	N/A
HY-Point Dairy Farms	43	N/A
Law Mobile Home Park	50	N/A
Maranatha Court	54	N/A
<b>LCR Monitoring Violation Totals</b>		
Number of Violations		9
Number of Systems Affected		9
Number of Repeat Violators		0
Total Population at Risk		801

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

**Figure 23. LCR 90<sup>th</sup> Percentile Action Level Exceedances, Delaware, 2017**

System Name	Population Served	Contaminant	AL <sup>1</sup> in mg/L <sup>2</sup>	90 <sup>th</sup> percentile in mg/L
Allen Harim Foods Inc.	750	Copper	1.3 mg/L	6.5 mg/L
Allen Harim Foods Inc.	750	Copper	1.3 mg/L	1.7 mg/L
First Step Pre-School	50	Lead	0.015 mg/L	0.036 mg/L
Hedgerow Hollow TP	147	Copper	1.3 mg/L	3.19 mg/L
Perdue Inc.	1500	Copper	1.3 mg/L	1.4 mg/L
Sussex Technical	1800	Lead	0.015 mg/L	0.29 mg/L
Sussex Technical	1800	Copper	1.3 mg/L	1.4 mg/L
<b>LCR 90<sup>th</sup> Percentile Action Level Exceedance Totals</b>				
Number of Exceedances			7	
Number of Systems Affected			5	
Number of Repeat Violators			2	
Total Population At Risk			6,797	

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<sup>1</sup>AL means Action Level

<sup>2</sup>mg/L means milligrams per liter

<b>Figure 24. Failure to have Licensed Operator Violations, Delaware, 2017</b>	
<b>System Name</b>	<b>Population Served</b>
Barkers Landing	498
Beach Babies Day Care	180
Center for the Creative Arts	115
Crossroad Christian Church Academy	68
Hartly Elementary School	450
Hilltop Trailer Park	135
Holiday Estates	75
Holiday Pines	210
Kristin's Care and Learning Center	44
Little People Child Development Center	82
Lotus Blossom Learning Center	30
RHST, LLC	30
Slaughter Beach Water II	31
Village Square Academy Learning Center	50
<b>Failure to have Licensed Operator Violation Totals</b>	
Number of Violations	14
Number of Systems Affected	14
Number of Repeat Violators	0
Total Population Affected	1,998

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<b>Figure 25. Monitoring Violations, Delaware 2017<sup>1</sup></b>		
<i>Systems that failed to collect the required number of samples during any monitoring period</i>		
<b>System Name</b>	<b>Population</b>	<b>Rule</b>
None	N/A	N/A
<b>Monitoring Violation Totals</b>		
Total Number of Violations	0	
Number of Systems Affected	0	
Number of Repeat Violators	0	
Total Population Affected	0	

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

<sup>1</sup> Excluding Lead and Copper

<b>Figure 26. Consumer Confidence Report (CCR) Rule Inadequate Reporting, Delaware, 2017</b>		
<b>System Name</b>	<b>Population served</b>	<b>Return to Compliance Date</b>
Smyrna Water Dept.	10,001	10/21/2016
Sussex Shore Water Company	350	12/09/2016
<b>CCR Violation Inadequate Reporting Totals</b>		
Number of Violations	2	
Number of Systems Affected	2	
Number of Repeat Violators	0	
Total Population Affected	10,351	

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

**Figure 27. Consumer Confidence Report (CCR) Rule, Failure to Report, Delaware, 2017**

<b>System Name</b>	<b>Population served</b>	<b>Return to Compliance Date</b>
Angola Beach Estates	1,275	N/A
Barkers Landing	498	08/17/2017
Bethany Crest	60	N/A
Town of Blades	1200	7/6/17
Brumbley's Family Park	48	7/10/17
Carpenters Row	60	7/3/17
Country House	425	9/25/17
Countryside Estates	50	7/10/17
Countryside Hamlet	66	N/A
County Seat Garden	297	8/9/17
Forest Park	46	7/19/17
Granada Mobile Home Ct.	138	7/2/17
Hilltop Trailer Park	135	N/A
Holiday Estates	75	N/A
Holiday Pines	60	N/A
Lakeside Homes LLC	32	8/11/17
Layton's Riviera	72	N/A
Maranatha Court	54	N/A
Messick's System 2	36	7/13/17
Messick's System 3	45	7/13/17
Messick's System 4	72	7/13/17
Messick's System 5	97	7/13/17
Messick's System 6	63	7/13/17
Mt. Pleasant Trailer Park	117	7/13/17
Pleasant Acres, LLC	60	8/16/17
Sussex Manor MHP	49	N/A
Todd's Mobile Court	189	8/11/17
White Oak Subdivision	30	N/A
Woodland Trailer Court	41	8/21/17
<b>CCR Violation Failure to Report Violation Totals</b>		
Number of Violations		29
Number of Systems Affected		29
Number of Repeat Violators		0
Total Population Affected		5,390

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2017.

## Conclusion

The ODW, the EPA, other state agencies, and non-governmental organizations are working with Delaware's public drinking water systems to ensure compliance with all applicable state and federal drinking water regulations. Together, they ensure that violations are corrected in a timely manner and provide technical assistance as needed. This cooperative action ensures that all Delaware residents and visitors receive safe and potable sources of drinking water.

The quality of drinking water supplied by public water systems in Delaware met the requirements of the SDWA in calendar year 2017. Of the state's 732,702 residents, 3,020 (0.4 percent) were exposed to contaminants such as total coliforms (including *E. coli*) and nitrates. Of 490 public water systems, nine (1.8 percent) had a violation for health-based contaminants. Nine additional water systems (1.8 percent) reported monitoring and reporting violations, and another nine different systems violated the Lead and Copper Rule.

Additionally, 29 water systems received violations for failing to submit their Consumer Confidence Reports (CCR) and delivery certification to ODW by July 1, 2017. The number of systems in violation for failing to submit their CCRs matched the total for 2016. However, they were not the same 29 systems as in 2016, only a few were repeat violators. Five water systems returned to compliance within one week; seven were in compliance by July 31, 2017; and seven more systems were compliant by the end of the year. The remaining 10 water systems had not returned to compliance by December 31, 2017. ODW mailed violation letters to those systems.

In 2017, ODW cited 14 public water systems for failing to have a licensed water operator, a violation of state regulations. This consistent issue is improving; in 2016, ODW issued 30 citations. Five systems without a licensed water operator are small community water systems. ODW is assisting with water operator recruitment by providing the systems with a list of water operators they can hire. The remaining nine water systems without a licensed water operator are non-transient non-community public water systems. ODW is encouraging them to designate an employee to take the limited license water operator course, offered by Del-Tech, so they can be certified to run only their water system. Since the majority of the non-transient systems are daycare businesses, ODW is working with the Office of Childcare Licensing, within the Department of Services for Children, Youth and Their Families, to enforce the regulation.

The Revised Total Coliform Rule require Level 1 or Level 2 assessments to be performed on public water systems with the presence of Total Coliform or *E. coli*. The purpose of a Level 1 assessment is to determine a likely cause of contamination. A Level 2 assessment is performed whenever *E. coli* is detected, or when the system has had two Level 1 assessments in a rolling 12-month period. A Level 2 assessment is an in-depth inspection of the water system to determine the likely source of contamination.

For detailed information about Delaware's public water systems, visit EPA's Envirofacts webpage at [www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html). Additional information can be found on the ODW website: [www.dhss.delaware.gov/dhss/dph/hsp/odw.html](http://www.dhss.delaware.gov/dhss/dph/hsp/odw.html). To view water system test results and other Delaware public water system data, visit the Drinking Water Watch website at <https://drinkingwater.dhss.delaware.gov/>. More information is available at this water quality website maintained by the Governor's Office: <http://www.delaware.gov/topics/waterquality/index.shtml>.