

Vermont's Public Drinking Water Systems Capacity Development Program Triennial Report to the Governor 2020



Helping public drinking water systems improve their technical, managerial, and financial capabilities so they can provide safe, affordable drinking water to their customers.

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October 2020

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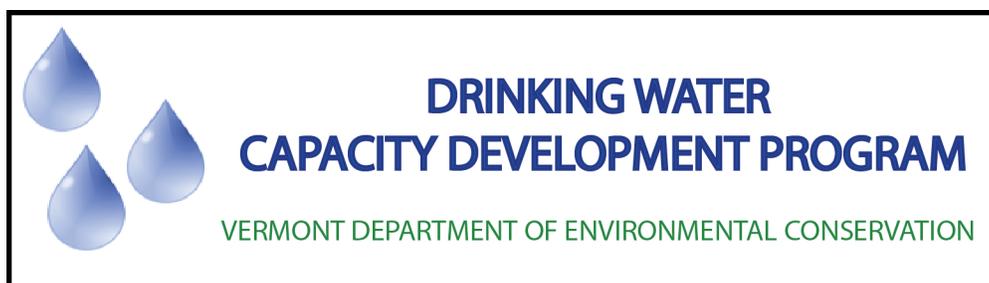


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Executive Summary

The Capacity Development Program's mission is to help Vermont's public drinking water systems improve their technical, managerial, and financial capabilities (TMF) in order for them to continue to provide safe drinking water to the public. The overall goals of capacity development strategy are to determine the reasons for lack of TMF capacity within Vermont's water systems, identify solutions, and effectively allocate resources to improve the TMF capacity of those systems most in need. The Drinking Water Groundwater Protection Division has been helping systems increase their capabilities for years by working with our water systems and responding to their specific needs.

The Capacity Development Program uses a number of tools to fulfill its mission, including: source permits and source protection plans, construction permits, operating permits, operator training and certification, capacity evaluations, long range plans, compliance monitoring, sanitary surveys, Drinking Water State Revolving Fund (DWSRF), and direct technical, operational, and compliance assistance from staff. This triennial report provides an overview of the program, the effectiveness of its strategies, and the recent progress made towards improving the capacity of Vermont's public water systems.

The services public drinking water systems provide are vital to the health, safety, and economies of communities throughout Vermont. The people managing these systems face significant challenges as they try to provide their customers a sufficient amount of safe, affordable water. Challenges include managing, repairing, and replacing aging and inadequate infrastructure; achieving financial viability; increasing resiliency to climate related events; recruiting and retaining qualified staff; responding to emergencies; adjusting to changes in demand for services; overcoming resistance to rate increases; adapting to changes in source water quality and quantity; addressing emerging contaminants (e.g., per- and polyfluoroalkyl substances (PFAS), blue-green algae, pharmaceuticals, and personal care products), and complying with new and more stringent regulatory requirements.

In the past three years, the Capacity Development Program helped many public water systems improve their capabilities and comply with drinking water regulations. The program has been busy revitalizing itself with a new Program Strategy and implementing new projects to help Vermont public water system's reach TFM capacity. Projects including more robust Asset Management Plans, Valve Exercising, Leak Detection, Standby Power Evaluations, and Lead Service Line Replacement Strategies.

But as drinking water infrastructure continues to age and degrade, systems will struggle to comply with regulations and meet their customers' expectations. Feeling pressure to keep rates low, many public water systems are not making the investments needed to properly maintain, repair, rehabilitate, and replace their assets. The Environmental Protection Agency (EPA) estimates that Vermont needs to invest more than \$643 million in public drinking water infrastructure in the next twenty years to ensure the health, security, economic viability, and well-being of our communities (Drinking Water Infrastructure Needs Surveys and Assessment, Sixth Report to Congress, March 2018).

Money from utility reserves and public financing is not enough to address Vermont's drinking water infrastructure needs. This financial shortfall is the greatest challenge for most public community water systems. In response, the Capacity Development Program is working on new tools and initiatives

to help systems meet this challenge. For example, a User Rates Dashboard is being developed which will allow systems to compare their user rates to other systems with similar sources and treatments and determine the best time for rate increases to ensure they can meet the current and future financial needs of their system. The Capacity Development Program continues to encourage systems to create and use an Asset Management Program (AMP), and has shifted from grants to 100% forgivable loans for systems wishing to develop asset management plans, allowing the Capacity Program to offer more money and more one on one assistance to create a more robust AMP for the water system.

An Asset Management Program uses detailed asset inventories, life cycle cost analyses, risk assessments, and financial planning to set priorities and help meet level of service goals in a cost-effective manner. It can help systems operate more efficiently, prolong asset life, plan and pay for future repairs and replacements, make informed decisions (e.g., when to conduct maintenance activities; whether to repair, rehabilitate, or replace an asset), justify system needs and decisions, set and gain support for appropriate user rates, meet service expectations and regulatory requirements, improve emergency response, make the best of use of limited resources, reduce vulnerability to hazards (e.g., flooding), and become more resilient. An effective program can help Vermont's public drinking water systems build capacity and make their systems more sustainable.

Most of our drinking water infrastructure is buried, so to many people it is "out of sight, out of mind". But we should not take the services it provides for granted. We need to invest more money in the infrastructure. Water systems' managers need to use better financial and management practices to operate, maintain, repair, rehabilitate, and replace infrastructure. Otherwise, we will not be able to continue to rely on public water systems for disease protection, fire protection, basic sanitation, economic development, and to support our quality of life.

Introduction

Vermont’s public drinking water systems face significant challenges as they try to comply with regulations, manage aging infrastructure, and achieve financial viability. To help address these challenges and to meet the requirements of the federal Safe Drinking Water Act’s (SDWA) 1996 Amendments, the Drinking Water and Groundwater Protection Division (DWGWP, or Division) created a Capacity Development Program. The Program’s objectives are:

- To ensure that new public community (CWSs) and non-transient non-community (NTNCs) drinking water systems demonstrate the technical, managerial, and financial capacity to provide a sufficient quantity of safe water in a cost-effective manner now and into the future;
- To help existing systems become more sustainable by improving their technical, managerial, and financial capabilities; and
- To ensure long term compliance with Vermont’s Safe Drinking Water Standards as specified under Chapter 21 of the Environmental Protection Regulations, Water Supply Rule.

When the Safe Drinking Water Act was amended (via the AWIA, America’s Water Infrastructure Act) it required: A description of how the state will, as appropriate (i) encourage development by public water systems of asset management plans that include best practices for asset management; and (ii) assist, including through the provision of technical assistance, public water systems in training operators or other relevant and appropriate persons in implementing such asset management plans.

Technical capacity refers to a system’s physical and operational abilities.

Managerial capacity refers to a system’s administrative and organizational abilities.

Financial capacity refers to a system’s abilities to generate or obtain enough money to maintain the system and pay for future improvements.

Figure 1. There are three types of public drinking water systems (PWSs):

The 1,382 PWSs in Vermont include 409 community, 249 non-transient non-community, and 724 transient non-community systems.

Community water systems serve 25 or more year-round residents or have 15 or more year-round residential connections;

Non-transient non-community water systems serve 25 or more of the same people at least six months per year. Examples include daycares, schools, and office buildings; and

Transient non-community water systems serve 25 or more people per day at least 60 days per year. The persons served need not be the same people. Examples include delis, hotels, campgrounds, and restaurants.

This triennial report provides an overview of Vermont’s Capacity Development Program, the effectiveness of its strategies, and the progress made toward improving the technical, managerial, and financial capacity of Vermont’s public water systems during the past three years. The first section briefly describes the state’s legal authority to ensure that all new CWSs and NTNCs demonstrate the capacity to comply with drinking water regulations. It also lists the compliance status of the systems that began providing water within the past three years. The next section of the report focuses on the Capacity Program’s strategy to help existing systems improve their technical, managerial, and financial capabilities. It describes how the Program identifies systems that need assistance and some of the tools used to help build capacity. The last part of the report describes the Program’s plans for the near future.

Capacity Development for New Public Water Systems

Section 1420(a) of the SDWA requires the state to ensure that all new CWSs and NTNCs beginning operations after October 1st, 1999, demonstrate the capacity to comply with regulations. Vermont’s legal authorities to implement this requirement are in statute (10 V.S.A. § 1685) and rule (Environmental Protection Rules, Chapter 21 Water Supply Rule). There were no changes to these legal authorities during the last three years.

Vermont’s Regulatory Program Application

The Water Supply Rule (Environmental Protection Rules, Chapter 21) prohibits a new CWS or NTNC from operating before demonstrating that it has adequate technical, managerial, and financial capacity. The rule also outlines the criteria to demonstrate capacity and includes several control points – places where the DWGWPD can exercise its authority to ensure a new system will have adequate capacity (see Figure 2). Each control point marks a significant milestone in demonstrating capacity. The DWGWPD makes a formal determination as to whether a system has adequate capacity at two points – prior to issuing the construction permit and prior to issuing the operating permit for new NTNC or CWS systems. In addition, the Capacity Program requires the PWS owner and consulting engineer to meet with the Capacity program and submit requested documentation, including a 5-year budget, prior to receiving *any* drinking water permits from DWGWPD. This step in the Capacity Review Process ensures that an owner does not become financially committed to becoming a public water system before the DWGWPD is convinced that, upon receiving all permits, the Water System can maintain over the long term adequate technical, managerial, and financial capacity.

Figure 2. Control points to ensure that new CWSs and NTNCs have adequate capacity.

- ◆ *Source Protection Plan Approval*
 - ◆ *Source Permit Issuance*
 - ◆ *Long Range Plan Approval*
 - ◆ *Construction Permit Issuance*
 - ◆ *O&M Manual Approval*
 - ◆ *Sampling Plan Approvals*
 - ◆ *Operator Certification*
 - ◆ *Operating Permit Issuance*
-

Capacity Determinations for New Public Water Systems

The table below lists new systems for which a capacity determination was completed during state fiscal year 2020. It also lists proposed systems for which an evaluation is underway, but not yet completed, and a note regarding their Capacity Review Status.

Table 1. Capacity evaluation status for new CWSs and NTNCs.

WSID	Water System Name	PWS Type	Date Activated	Capacity Review Status
VT0021005	Sundance Subdivision	CWS	Proposed	Source and Construction permit issued, capacity review process started, project on hold by Water System
VT0021396	Daniels Construction	NTNC	Proposed	Source and Construction permit issued; capacity review process ongoing
VT0021588	17 Black Walnut LLC	CWS	Proposed	Source permit application received, capacity review process started, project on hold by Water System
VT0004644	Manchester Estates	CWS	Proposed	Source permit application received, capacity review process started, project on hold by Water System
VT0021646	Bromley Best Farm	CWS	Proposed	Source permit application received; capacity review process started
VT0021654	Farm Developing Hotel and Restaurant CTR	NTNC	Proposed	Source and Construction permit issued; capacity review process ongoing
VT0021689	Peak Building	NTNC	Proposed	Source and Construction permit issued; capacity review process ongoing
VT0021704	Green MTN National Forest Office	NTNC	Proposed	Source permit application received; capacity review process started

New System Compliance

The best measure of the capacity development strategy’s effectiveness for new water systems is whether they are in compliance with drinking water regulations, especially the health-based standards. If a public water system does not comply with a federal and state drinking water regulation, the DWGWPD notifies the water system’s owner(s) and operator(s) of the alleged violation. The Division’s notification of violation letter requests that the system inform the public of the alleged violation, provide corrective action as necessary, and return the water system to compliance with safe drinking water standards. The DWGWPD also offers the system technical assistance to help them return to compliance (on-site inspections, written determinations, meeting discussion, engineering assistance and permitting). If the system still does not make significant effort and progress to comply with established safe drinking water standards, the DWGWPD takes necessary and appropriate enforcement action.

All the new systems activated in the past three years are currently in compliance with the drinking water health-based standards. During 2018-2020, however, one of the systems violated health-based standards.

- Kids of the Kingdom on the Hill – the Water System met the total coliform treatment technique trigger on several occasions during this period, resulting in comprehensive site-inspections to

identify possible sources of contamination. The Water System issued boil water notices and boosted chlorine treatment. Following the issues, the Water System monitored residual chlorine and sampled repeatedly for total coliform to demonstrate their ability to comply with this health-based standard. The water system kept their customers informed during the contamination events. E. coli bacteria was not detected, and no adverse health effects were reported.

Another important compliance and capacity measure is the Environmental Protection Agency’s (EPA’s) Drinking Water Enforcement Targeting Tool (ETT) score. The ETT score measures noncompliance across all federal rules, placing higher weight on the health-based standards. A violation of an acute MCL, for example, carries more weight than that of a reporting violation. A score is calculated for each system based on violations occurring within the past five years and any older open-ended violations. It does not include violations for which the system has returned to compliance, or has been issued an enforceable directive to return to compliance (e.g., a schedule in an operating permit).

The DWGWPD uses the Drinking Water Enforcement Targeting Tool (ETT) to help prioritize enforcement actions. Table 2 lists the ETT status of CWSs and NTNCs activated during the past three years. Systems that exceed a score of ten and remain on the list above 10 for a period of 6 months or more become an immediate enforcement priority. No systems activated in the past three years has a score of more than ten.

Table 2. Compliance status of CWSs and NTNCs activated within the last 3 years that had capacity determinations.

WSID	Water System Name	PWS Type	Date Activated	On ETT list? Score?
VT0000512	DC Lang LLC – Georgia Daycare	NTNC	4/24/2019	No
VT0021585	Kids of the Kingdom on the Hill	NTNC	9/29/2017	No
VT0021446	The Binding Site VT	NTNC	3/16/2017	No

Capacity Development for Existing Public Water Systems

Capacity Development Strategy

Section 1420(c) of the SDWA requires the state to develop and implement a strategy to help existing public water systems acquire and maintain technical, managerial, and financial capacity. In July 2000, the DWGWPD published its “Existing Public Water System Capacity Strategy.”

In 2020, the Capacity Program submitted Vermont’s updated Capacity Development Strategy to EPA for review and approval. The strategy’s major components are listed in Figure 3. Twenty years offers quite a bit of change in everything from how the Division operates to different technologies available to support TMF Capacity. And yet some things remain the same. As in 2000, the Division continues to support TMF capacity in water systems through source permits and source protection plans, construction permits, operating permits, certified operators, compliance monitoring, sanitary surveys, and individual help from staff.

The 2018 AWIA provisions to the SDWA include that states must amend their state capacity development strategies to include a description of how the state will encourage the development of asset management plans that include best practices, training, technical assistance and other activities to help with implementation of those plans. The Division considers Asset Management one of the best ways to achieve the maximum TMF capacity within the limited resources that VT water systems possess.

The overall goals of the Division’s capacity development strategy are to determine the reasons for lack of TMF capacity within our water systems, identify solutions, and effectively allocate resources to improve the TMF capacity of those systems most in need. The DWGWPD has been helping systems increase their capabilities for years by working with our water systems and responding to their specific needs.

Prior to developing the updated capacity development strategy, the DWGWPD created a Capacity Survey for Community Water Systems. This survey asked the water systems to clarify what support they needed from the DWGWPD in order to improve their TMF Capacity. The DWGWPD utilized the answers to this survey to update our strategy and develop more comprehensive Asset Management training and funding for Asset Management Plans.

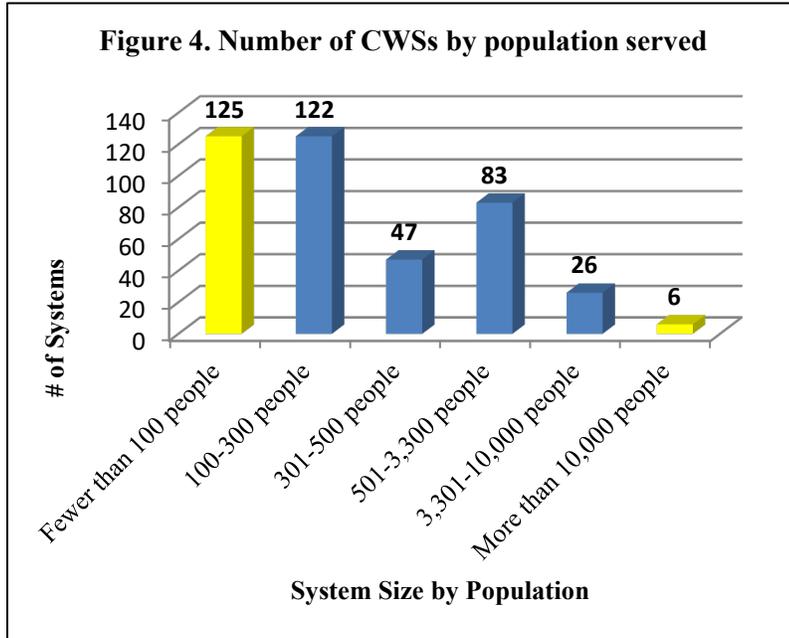
Due to Vermont’s small size and community-minded approach to everyday life, the commitment to individual attention and support is a high priority for the DWGWPD. Public water systems in Vermont know that the best way to get technical, managerial, or financial assistance is by reaching out to Division staff. Whether it is water quality monitoring compliance questions, different treatment approaches available, or long-term planning options, the Division staff consistently offer high quality, one-on-one support to water systems. This tradition of an “open-door” policy allows for honest communication and reminds the water systems that DWGWPD wants what is best for Vermont’s citizens and their water systems.

The State's updated capacity development strategy is based on existing drinking water programs and activities and new programs and activities that will allow the State to meet its goals. The DWGWPD will utilize feedback from interested organizations, such as Vermont Rural Water Association and USDA, as well as the public, and future Capacity Surveys, to continue to enhance the DWGWPD’s capacity development strategy to support the TMF capacity of Vermont’s water systems.

Figure 3. The *Existing Public Water System Capacity Strategy* describes:

- ◆ The methods or criteria used to identify and prioritize systems in need of capacity development assistance.
- ◆ The factors (e.g., legal, regulatory, or institutional) at the federal, state, or local level that encourage or impair capacity development.
- ◆ The ways the state uses its authorities and resources to help systems comply with regulations, encourage the development of partnerships between systems, and train and certify water system operators.
- ◆ The methods used to establish a baseline and measure improvements in capacity.
- ◆ The ways to involve interested parties in developing and implementing the capacity development strategy.

Existing Public Water Systems



During Fiscal Year 2020, there were 1,382 active public water systems in Vermont, including:

- 409 Community systems (CWSs),
- 249 Non-Transient Non-Community systems (NTNCs), and
- 724 Transient Non-Community systems (TNCs).

Vermont is unique in that 72% of its CWSs are very small (i.e., serve 500 or fewer people). According to the EPA, only about 56% of CWSs nationwide are this small (EPA Document 816-R-10-022, July 2011). Figure 4 shows a breakdown of the CWSs in Vermont by population served. As this figure depicts, the number of very small water systems far outweighs the number of large systems. Most small systems in Vermont were created when regulatory standards were less stringent than they are today. For example, most of Vermont's small CWSs were created between 1975 and 1987. The smallest systems are often run by part-time or volunteer staff with limited time and limited budgets. Many do not generate enough revenues to cover the system's full cost of service because they have a very small customer base and inadequate water rates. Too often water service rates have been kept low by relying on volunteers or underpaid staff, and deferring infrastructure maintenance, repairs, and replacement.

Lacking strong capacity, specifically managerial and financial capacity, these systems need the tools and training to help them operate in a more sustainable manner. Water systems need assistance to identify their infrastructure needs and the resources available to assist them in completing necessary and required improvements. While the Capacity Development Program provides its assistance to all CWSs and NTNCs, extra focus is on the smallest, and frequently the most non-compliant, community systems.

Identifying Systems that Need Assistance

The Capacity Development Program uses compliance data and routine on-site inspections called sanitary survey findings to help identify systems in greatest need of technical assistance. DWGWPD staff conducts a sanitary survey at each system every three years. In state fiscal year 2020, staff surveyed 116 CWSs and 97 NTNCs.

During each survey, division staff reviews the system's compliance with regulatory standards and provides the water system with guidance on how to improve operations and management. If the system is identified as needing technical, managerial, and/or financial capacity assistance, the surveyor refers them to the Capacity Development Program.

Information from capacity determinations for systems applying for DWSRF loans is also used to direct technical assistance to the Program. The DWSRF Program Lead completes most of the capacity determinations for loan applicants, while Capacity Development Program staff complete the eligibility determinations related to loans that involve a change in ownership of the water system. During the capacity assessment, staff ensures that the improvements project that is being proposed for DWSRF loan funding is designed to address technical deficiencies that have been identified by the Division. For systems lacking managerial capacity, staff prepares a list of tasks that, if completed, will improve the water system's capacity. These tasks are either provided as recommendations to the system, included as a compliance improvements schedule activity within an operating permit, or as a requirement for loan approval or forgiveness. The DWSRF Program Lead and/or the Capacity Development Program staff work with systems that request help completing the tasks.

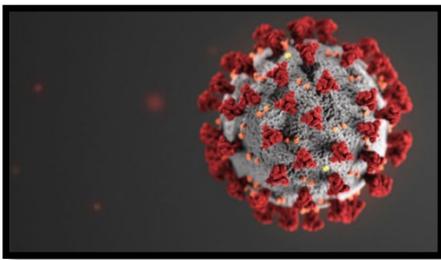
Recently, the DWSRF program made some changes to the capacity determination process. Beginning in 2020, the Vermont Bond Bank and the Vermont Economic Development Authority's underwriting review will serve as the Financial capacity evaluation. Technical and Managerial capacity evaluations are conducted by the DWSRF Program Lead using information in state permitting, inspection, and enforcement databases, information submitted as part of the loan application, and through a phone call with the applicant. The state does not award DWSRF monies to systems that lack adequate capacity unless the funds will improve the system's capabilities and address chronic non-compliance issues.

The State of Vermont is facing a significant childcare shortage that is affecting the local economies of our rural towns. As smaller, in-home daycares are closing, the need for childcare in rural towns is growing, and the DWGWPD is seeing an increase in the number of childcare locations that want to serve 25 or more individuals. The financial impacts of being a public NTNC are often too steep for small-to-medium sized childcare centers to undertake. The Capacity Program has been working with the State of Vermont Child Development Division, as well as local organizations that are focused on ensuring affordable high-quality childcare for all Vermont families, to ensure that childcare centers that will meet the definition of public NTNC water systems are aware of the regulations and have as much support as possible to be successful now and into the future.

Providing Assistance to Improve Capacity

During the past three years, the state continued to use tools identified in the capacity development strategy to help systems improve their technical, managerial, and financial capabilities. These tools include: source, construction, and operating permits; sanitary surveys; operator certification; financial assistance programs, including low interest and negative interest loans; capacity assistance consultations; technical assistance consultations; and source water assessments. The Division continues to develop new capacity development initiatives using set-aside funds from the DWSRF, while continuing to emphasize Asset Management and Water Loss Control Programs.

Covid-19 Pandemic



In 2020, the Covid-19 pandemic brought dramatic changes to the country and thus Vermont. In March of 2020, the governor of Vermont issued a Stay Home, Stay Safe Order, and directed the closure of in-person operations for all non-essential businesses. State employees were mandated to work remotely. This of course changed the way everyone worked and took some adjustment time. As a general precaution, some of the Capacity programs and funding were initially frozen. The Leak Detection Program and the Rates Dashboard Initiative were temporarily suspended. Asset Management Workshops were postponed as in person gatherings were discouraged. For water systems, construction projects were put on hold. Operators spent more time fielding customer questions on water safety regarding Covid-19. Concerns over revenue issues began to grow.

As restrictions ease and Vermont returns and adjusts to a new normal, the focus can return doing the day to day jobs, albeit a bit different. The Capacity Development Program is adjusting in how to help water systems remotely. Trainings and meetings are now virtual to help people maintain a safe distance. Some contractor services will begin again in 2021 as the work can be completed via safe social distancing and other safety precautions. Focus is also on potential issues expected from the Covid-19 pandemic such as: reductions in some drinking water system revenues as consumers are unable to pay for water and changing water demands in communities with more people working from home and schools doing more distance learning.

Sanitary Surveys

A sanitary survey is an on-site inspection of a system's water source, facilities, equipment, operation, and maintenance. The surveys are conducted by DWGPD staff. During a survey, the surveyor identifies sanitary deficiencies and assesses a system's capability to supply safe drinking water. A compliance schedule to address any deficiencies is then incorporated into the system's operating permit. Table 3 lists the number of sanitary surveys conducted during the past three years.

Table 3. Number of sanitary surveys conducted during the past three state fiscal years

PWS Type	State Fiscal Year 2018	State Fiscal Year 2019	State Fiscal Year 2020
CWSs	184	129	116
NTNCs	49	116	97
TNCs	118	122	70
<i>Total</i>	<i>351</i>	<i>367</i>	<i>283</i>

Operator Certification

All public water systems are required to have a certified operator. The operators are responsible for protecting public health by operating and maintaining drinking water infrastructure in a safe, optimal, and reliable manner. Systems without a qualified, accountable operator lack the capacity to provide safe drinking water. As of September 18, 2020; 7 community, 7 non-transient non-community, and 39 transient non-community drinking water systems did not have a certified operator. The Division sends the water systems lacking a certified operator a notification letter. If they do not obtain a certified operator in a timely fashion, normally within 30-days, they will be issued a notice of alleged violation and subject to enforcement activities.

The DWGPD’s Operator Certification Program helps ensure that operators receive the training necessary to fulfill their duties. Currently, there are 1,211 certified operators and 39 operators-in-training. The DWGPD has an active contract with the Vermont Rural Water to conduct trainings. A total of 4,424 training credit hours were awarded in 2018 and 6,598 were awarded in 2019. The number of credit hours for 2020 will be compiled and included in the next Operator Certification Program Annual Report, which will be available on July 1st, 2021.

PFAS

In response to PFAS contamination in Vermont's environment, Act 21 (S.49), an act relating to the regulation of polyfluoroalkyl substances in drinking and surface waters, was passed by the Legislature and signed by Governor Scott in May 2019. This law established an interim standard of 20 parts per trillion (ppt) of five specific PFAS compounds- PFOA (perfluorooctanoic acid), PFOS (perfluorooctane sulfonic acid), PFHxS (perfluorohexane sulfonic acid), PFHpA (perfluoroheptanoic acid), PFNA (perfluorononanoic acid)- in Public Community and Non-Transient Non-Community Water Systems. The act required PFAS monitoring to be conducted by December 1, 2019.

The act also required that ANR file with the Secretary of State by February 1, 2020 a revision of the Water Supply Rules to include a Maximum Contaminant Level for these five PFAS compounds. On March 17, 2020, a revised Vermont Water Supply Rule was adopted to establish a Maximum Contaminant Level (MCL) as well as routine public drinking water monitoring frequencies for PFAS. The sum of these five PFAS contaminants cannot exceed 20 ppt.

In order to support the technical and financial impact of this unexpected contamination on Vermont’s Water System, the Division funded the development of “The Drinking Water PFAS Response Plan Guidance Document” for public water systems to use as a reference guide to plan, prepare for and implement response action if per- and poly-fluoroalkyl substances are detected in a their water system.

In 2020 the Vermont Legislature established a new fund known as the Contaminants of Emerging Concern Special Fund (CECF) for the purpose of providing grants to public water systems responding to or remediating emerging contaminants in a public water supply. In addition to establishing the CECF, the legislature approved the Capital Construction and State Bonding Adjustment Act of 2020 (Act 139), which appropriated \$500,000 to the CECF, for the award of grants for engineering and construction related to improvements for public water systems with confirmed concentrations of PFAS exceeding 20 ppt and on a do-not-drink notice. Additionally, Act 139 authorizes the Agency to use \$50,000 of the appropriated amount for grants to reimburse any schools for their costs of providing bottled or bulk water. Grants are being awarded to those public water systems with PFAS contamination in their drinking water following the required monitoring that was conducted under Act 21. Vermont’s public water systems are now required to routinely monitor for PFAS under the Vermont Water Supply Rule.

As of September 30, 2020, 587 Public Community and Non-Transient Non-Community Water Systems have monitored for PFAS in accordance with the Act. Seven of these systems had PFAS levels that exceeded the 20ppt standard.

Drinking Water State Revolving Fund

The 1996 Amendments to the SDWA created the DWSRF. The fund establishes a financial mechanism to help states achieve the SDWA’s public health protection goals. Each year the EPA gives Vermont a grant to capitalize the fund. The State must match at least 20 percent of the federal grant. The money is used to provide public water systems planning and capital improvements loans and other types of assistance. Table 4, see below, lists the federal grant monies and state match added to the fund for the past three years. The federal grant amount for federal fiscal year (FFY) 2020 is expected to be \$11,011,000. This would require a state match of \$2,202,200 and result in a \$13,213,200 addition to the fund.

Table 4. Federal grant monies and state match added to the Drinking Water State Revolving Fund the last three years.

Federal Fiscal Year	Federal Capitalization Grant Amount	State Match (20% of Federal Grant)	Total Capital Added to the Fund
2018	\$11,107,000	\$2,221,400	\$13,328,400
2019	\$11,004,000	\$2,200,800	\$13,204,800
2020	\$11,011,000	\$2,202,200	\$13,213,200
Three Year Total	\$33,122,000	\$6,624,400	\$39,746,400

Monies from Vermont’s DWSRF are critical to helping public drinking water systems achieve and maintain technical, managerial, and financial capacity. The SDWA requires the state to prepare an Intended Use Plan each year that describes how the DWSRF monies will be spent. Most of the monies are used to fund loans to public water systems for capital improvement projects. Systems serving disadvantaged communities are often eligible for some principal forgiveness and more favorable loan conditions

To date, loans of more than \$244 million have been awarded through the DWSRF. The table below lists the number of executed loans and the amounts for each of the past three state fiscal years.

Table 5. Loans from the Drinking Water State Revolving Fund executed in the last three years.

State Fiscal Year	Number of Loans Executed	Dollar Amount of Loans*
2018	12	\$12,693,144
2019	9	\$4,755,786
2020	18	\$16,517,674
Three Year Total	39	\$33,966,604

* The loans executed in a given year may include funds from the current year’s federal grant and state match, as well as monies from interest earnings, loan repayments, and uncommitted funds from previous years.

DWSRF Set-asides

While the vast majority of the DWSRF monies are used for planning and construction loans, a small percentage is earmarked for other types of assistance. These other types of assistance are referred to as “set-aside” activities. Some of the more recent set-aside activities are described below.

Asset Management Programs (AMP) - Workshops, Grants, and Loans

As stated above, the 2018 AWIA provisions to the SDWA include that states must amend their state capacity development strategies to include a description of how the state will encourage the development of asset management plans. The Vermont Capacity Development Program has been incorporating Asset Management into its program for 5 years now. In the 2014 capacity questionnaire, Vermont’s community water systems identified “creating or updating an Asset Management Program...or other tool to help manage the water system” as a top priority. In order to help community water systems develop an Asset Management Program, the Capacity Program has hosted multiple Asset Management training workshop series each year since 2015, and followed up by offering grants in 2016 and 2017 for Asset Management Plans to select community water systems. In 2018, the Capacity Program transitioned from a grant program for asset management plans to a forgivable loan program for these plans.

An Asset Management Program uses level of service goals, a detailed asset registry, system maps, life cycle cost analysis, risk assessments, risk and cost reduction strategies, and financial planning to help set priorities and meet customers’ expectations in a cost-effective manner. It can help systems:

- ◆ Operate more efficiently,
- ◆ Prolong the life of assets,
- ◆ Make informed decisions,
- ◆ Justify needs and decisions,
- ◆ Plan and pay for future repairs and replacements, and
- ◆ Become more resilient and sustainable.

During the workshops, participants learned how to develop the components of an Asset Management Program to help solve a problem with their drinking water utility. Between each of the workshops, the participants apply what they learned by working on portions of an Asset Management Program (i.e. Level of Service Goals, Asset Management Inventory and Condition Assessment, Maps, Life Cycle Cost Analysis, Risk Assessment, Risk and Cost Reduction Strategies, Funding Strategies) for their system. By the end of the workshop series each water system has developed a program for part of their system and gained the knowledge and confidence to grow their water system’s Asset Management Program over time. To date, a total of 55 water systems have attended these trainings.

In October 2019, an Asset Management Roundtable discussion was held for participants of the past training workshops. Twelve people representing 8 water systems and 2 consultants attended. They were invited to share their successes and challenges in implementing asset management. It was not a training, but rather, an opportunity for dialog and sharing between systems. The feedback was positive, and the Capacity Development Program plans to hold more of these roundtable discussions in the future. The Asset Management Workshops were postponed in 2020 due to the Covid-19 pandemic. Vermont intends resume holding these workshops in 2021.

In 2016 and 2017, the Division’s Capacity Development Program offered systems grants of up to \$20,000 to assist with the development and implementation of an Asset Management Program. These grants were used by the community water systems to develop portions or complete Asset Management Plans, depending on the size of the water system.

In CY2018, the Division’s Capacity Development Program transitioned from grants to 100% forgivable planning loans for Asset Management Plans for up \$50,000. To receive 100% forgiveness for these DWSRF Planning Loans, the Water System Operator and a Board Member must attend training in asset management and a complete approved Asset Management Plan must be developed. The Capacity Development Program is limiting the number of forgivable Asset Management Planning Loans issued to five a year to allow Division staff the time to help the recipients and ensure the Asset Management Plans developed are robust and meet the needs of the individual water system. This is achieved by holding status meeting several times a year, as well as providing notes and feedback on sections of the AMP as they are developed. The complete plan is again reviewed before it is approved by the Division.

Table 6. Number of systems with funding to complete each component of an Asset Management Program.

Asset Management Program Components	2016 Number of Systems with Grant Funding for Component	2017 Number of Systems with Grant Funding for Component	2018 Number of Systems with Loan Funding for Component	2019 Number of Systems with Loan Funding for Component	2020 Number of Systems with Loan Funding for Component
Level of Service Agreement (Goals and Performance Measures)	19	16	5	4	4
Asset Inventory and Condition Assessment	27	21	5	4	4
Maps	19	18	5	4	4

Life Cycle Cost Analyses	12	17	5	4	4
Risk Assessments	23	16	5	4	4
Risk and Cost Reduction Strategies	21	17	5	4	4
Funding Strategies	19	16	5	4	4

Drinking Water Lead Reduction Strategies Grants



In 2017, the Capacity Development Program offered \$125,000 in grants to help public CWSs reduce the risks of exposure to lead in drinking water. Two community water systems were awarded the Lead Reduction Strategies Grants, Springfield Water Department and Bennington Water Department. Both water systems were able to use the grant money to map, inventory and sample connections, and develop a “plan of attack” to address the lead in their distribution system, whether it is on the water system owned side, or the customer owned side.

In 2020, Vermont’s DWSRF program elected to transfer funds from the CWSRF to DWSRF for the purposes of 100% principal forgiveness for lead-related projects, under 2019’s WIFTA. Due to Bennington’s previous work developing a Lead Reduction Strategy Plan, under the above grant, Bennington was in the position to be “shovel-ready” to utilize this funding. They have been awarded up to \$11 million to replace all the remaining lead service lines in their distribution.

Recognizing the tremendous public health effects from lead exposure, and the great value of lead service line removal, the Capacity Development Program had planned to offer the Lead Reduction Strategies Grant again in 2020. However, it was postponed due to the Covid-19 pandemic. This grant will be offered again in 2021 to help systems suspected to contain lead infrastructure and needing assistance in creating a removal plan.

Leak Detection Surveys



Finding and repairing leaks in a timely fashion can minimize wasteful water withdrawals, reduce treatment costs, capture lost revenue, prevent disruptions to the water system, and protect public health. For the sixth consecutive year, the Capacity Development Program has offered free leak detection services to CWSs.

The 2019 leak detection surveys took place at the beginning of the state’s fiscal year 2020, twenty public community drinking water systems received leak detection

services. About 79 miles of pipe were surveyed and 48 leaks were identified. An estimated 151 gallons per minute (217,800 gallons per day) of drinking water was being lost through these leaks. Capacity Development Program staff followed up with the systems to ensure that the leaks were fixed or there was a plan to do so.

Leak Detection was postponed in 2020 due to the Covid-19 pandemic. The Capacity Development Program is planning for this program to return in the spring of 2021, as it serves a vital service for Vermont’s water systems.

Table 7. Summary of leak detection surveys 2014 - 2019.

Year	Number of Systems	Miles of Pipe Surveyed	Number of Leaks Identified	Estimated Losses from Leaks Identified (gallons per day)
2014	25	155	51	519,840
2015	24	359	89	1,731,960
2016	32	257	117	936,720
2017	17	55	19	110,880
2018	14	94	37	89,640
2019	20	79	48	217,800

Valve Exercising



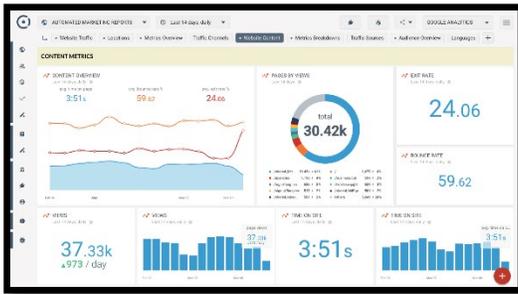
Waterline distribution valves are rarely used, and the need for operation (opening and closing) often comes at times of critical usage. In an emergency, sections of a water distribution system may need to be completely shut down without delay. It is not uncommon for valves to rest idle for many years, even decades between operation. If a valve is not used or properly exercised, it can seize-up from corrosion and make the valve inoperable. Valve exercising programs can help maintain the useful life, safety and operation of water system valves.

In fall of 2019, the Capacity Development Program offered for the first-time free valve exercising services to CWSs. Seven CWSs were awarded services including: locating each valve to be exercised, verifying valve location with district maps, cleaning valve boxes and painting valve box lids, operating/exercising the valve, documenting valve location, number of turns, size, turn direction, and depth, identifying valves that were inoperable, broken, leaking, etc., and furnishing a database with collected information. In all 303 valves were exercised. One system operator commented that he knew one valve exercised for his system had never been turned before, and that the service paid for itself with just that one valve being exercised. The capacity program plans to offer valve exercising again in 2021.

Table 8. Summary of Valve Exercising Program 2019.

Year	Days Awarded	Number of Systems	Total Number of Valves Exercised
2019	30	7	303

Rates Dashboard



Setting an effective water usage rate while conserving resources can improve a water utility’s financial health and efficiency. A water rate that is appropriate and maintains one water utility is not likely to work as well for another system, even if that utility is similar in size and scope and is located in the same region. For many public utilities, water rate setting is a fairly arbitrary process with significant political pressure to keep rates artificially low. In

some communities, water rates are based primarily on historical costs. Following this method creates the impression that the cost of water in the future will cost the same as it does today. This inefficient method can actually lower the value of water, misleading customers into thinking that stagnate rates equates to an abundant resource which, in turn, may lead to unsustainable usage.

A digital Water Rates Dashboard is an interactive tool that will allow water systems to compare their user rates to other water systems using a multitude of factors, including utility finances, system characteristics, customer demographics, and geography. This comparison will help utility managers and local officials in establishing appropriate rates for their water system. In 2020, the Capacity Development Program sought proposals from contractors to create a digital Water Rates Dashboard. A contractor was chosen, but the Covid-19 Pandemic stopped the project moving forward at the time. The Rates Dashboard work is slated to start up again in the fall of 2020.

Revised Total Coliform Rule – Level 2 Assessments



To meet the goals of the Revised Total Coliform Rule, the Drinking Water and Groundwater Protection Division’s Compliance and Support Section offers free Level 2 Site Assessments to CWSs and NTNCs following the triggers identified in the Rule, including an *E. coli* maximum contaminant level violation, or certain repeated total coliform or compliance issues. The goal of the assessments is to help identify sanitary defects or issues that triggered the assessment or led to the compliance issues, and recommend corrective actions to resolve the issue. This will lead to a better understanding of the water system by the operator, increased compliance with drinking water regulations, and greater protection of public health. Twenty-eight Level 2 Site Assessments were completed at CWSs and NTNCs during the 2020 state fiscal year, 21 by assessors, 7 by Division staff.

Stand-by Power Initiative



In 2018, the Division, in conjunction with DWSRF Program, offered standby power evaluations to CWSs, as well as NTNCs that have been designated emergency shelters. This initiative was split into two phases. For the first phase, the DWGWPD assigned contractor provided free sizing, design, and benefit-cost analysis for auxiliary power supplies to operate water system infrastructure during interruptions to the main electrical supply. Ten water systems received free stand-by power evaluations.

In Phase Two, as follow-up to the evaluations, the DWGWPD combined four of the standby power evaluations into a single application for a grant offered by the Federal Emergency Management Agency’s (FEMA’s) Hazard Mitigation Grant Program to assist those public drinking water systems with the purchase and installation of standby power. Unfortunately, after two years the Division still had not gotten approval of the FEMA grant. So, in 2020 the Division decided to move ahead in a different direction. Using DWSRF funds, the Division set up a procedure for all ten systems to receive up to 100% principal loan forgiveness for Standby Power installations associated with the approved Standby Power evaluation plans performed in 2018.

The table below summarizes other on-going capacity development initiatives.

Table 9. On-going capacity development initiatives for existing systems.

Initiative	Target Audience	Description
Drinking Water State Revolving Fund (DWSRF) Program Changes	Potential DWSRF loan recipients	Changes were made to the Priority List ranking criteria in December 2016. These changes attempt to streamline the deficiency point categories, preserving award of the highest points to the most serious public health risks, elevating projects that will address lead and copper issues, and refining how aged infrastructure is addressed. For the aged infrastructure issue, three new categories were created to better reflect what the funding and regulating programs are witnessing: inadequacy of critical components, system vulnerability to contamination, and improvements to/redundancy of system components.
Training and Assistance	Public water system (PWS) owners and operators	Contract with Vermont Rural Water Association to provide technical assistance and conduct group and one-on-one trainings. Appendix B includes a summary of the training provided during the year. Since 2015, the Capacity Development Program has also hosted intensive Asset Management workshop series.
User Rate Reviews and Budgeting/Assisting in the Development of Financial Capacity	CWSs, NTNCs	Systems have contacted the Capacity Development Program for assistance in establishing an equitable user rate structure. The Capacity Development Program hosts Rate Setting workshops yearly.

By-laws & Ordinance Development and Updates	CWSs	Several water systems requested help with creating or updating by-laws and ordinances. Developing a checklist of items to include in a municipal ordinance.
Ownership restructuring	CWSs, NTNCs	Providing guidance while undergoing restructuring (e.g., forming a Fire District to acquire a privately-owned system, assisting with a merger between two municipal entities)
Technical Assistance, RTCR Assessments, and Contamination Investigations for transient non-community (TNCs) water systems.	TNCs	The DWGWPD has contractors available to provide technical assistance, conduct contamination investigations and RTCR assessments at TNCs. Assistance includes determining the possible causes of contamination, identifying sanitary defects, making recommendations on how to improve the system and comply with regulations. This service has helped educate owners and operators at TNCs on drinking water regulations, protect public health and assist systems with staying in compliance or returning to compliance more quickly.

Effectiveness of the Capacity Development Strategy for Existing Public Water Systems

As with new systems, the best measure single measure of the effectiveness of the capacity development strategy for existing water systems is whether they are in compliance with federal and state drinking water regulations, especially the health-based standards. The majority of Vermont’s population are served by those water systems in compliance.

Table 10. Percentage of population served by systems in compliance with the health-based standards in the past three state fiscal years.

PWS Type	% of Systems in Compliance			% of Population Served by Systems in Compliance		
	2018	2019	2020	2018	2019	2020
CWSs	95	89	94	99	99	99
NTNCs	99	97	99	99	99	99
TNCs	95	88	94	98	98	99

Note: Vermont state fiscal years were used as the time periods.

The ETT scores are another compliance measure used to gauge capacity development efforts. An ETT score is calculated for each public water system as a measure of noncompliance across all federal rules. Systems that exceed a score of ten lack the capacity to comply with regulations and become an immediate enforcement priority. Those with scores of ten or less are tracked closely.

Table 11. Number of systems with a Drinking Water Enforcement Targeting Tool score of more than ten.

PWS Type	ETT Report Date Jan 2018	ETT Report Date Jan 2019	ETT Report Date Jan 2020
CWSs	11	16	16
NTNCs	2	6	2
TNCs	20	14	6

Table 12. Community Systems with a Drinking Water Enforcement Targeting Tool score of more than ten as of September 2020.

WSID	Water System Name	PWS Type	ETT Compliance Score
VT00021053	Meadows – Gables I Water System	CWS	41
VT0005043	Ryegate Fire District 2	CWS	27
VT0005530	Union House Nursing Home	CWS	19
VT0005324	Okemo Village Condominiums	CWS	15
VT0021570	Gables II Water System	CWS	15
VT0020760	East Mountain MHP	CWS	14
VT0005397	Battleground Condominium	CWS	14
VT0021515	Northwoods Village Apartments	CWS	12
VT0005120	Franklin Water System	CWS	12
VT0005640	Country Club Condominium	CWS	12
VT0005342	Mount Ascutney MHP	CWS	12
VT0005584	Parsons Hill Partnership	CWS	11
VT0005013	Arlington Water Dept	CWS	10

While compliance with the drinking water standards is a useful measure of capacity, it does not indicate whether a system will have adequate capacity in the future. Any system could quickly fall out of compliance due to a number of factors, including changing water quality, degrading infrastructure, increasing regulations, or changes in staff. The updated Capacity Development Strategy includes many ways to evaluate and enhance a system’s technical, managerial, and financial capabilities.

Capacity Development – Looking Forward

Vermont’s Capacity Development Program centers on the overall goals of the 2020 Capacity Development Strategy: to determine the reasons for lack of TMF capacity within our water systems, identify solutions, and effectively allocate resources to improve the TMF capacity of those systems most in need.

In 2014, Vermont’s Capacity Development Program surveyed its public water systems asking for ways they wanted assistance from the Program. Asset Management programs and training was a big piece to come from that survey. The Capacity Development Program plans to implement another survey in the coming future to narrow in on what and where systems feel the greatest need for assistance lies. The replies will help direct the Capacity Development Program in offering new trainings and creating new initiatives programs.

However, the Capacity Development Program is aware of many of the issues facing Vermont’s water systems. As previously stated, the EPA estimates that Vermont needs to invest more than \$643 million in public drinking water infrastructure in the next twenty years to ensure the health, security, and economic well-being of our communities (Drinking Water Infrastructure Needs Surveys and Assessment, Sixth Report to Congress, March 2018). This estimated infrastructure expense does not include sufficient revenue for on-going operations and maintenance, expenses incurred to comply with

new regulations, or expenses associated with expanding water systems. Additionally, the financial effects of the Covid-19 Pandemic will also likely add to this burden.

“You cannot have a first-rate community...with third-rate infrastructure”– Source unknown

Sustainable drinking water systems must have the technical, managerial, and financial capabilities to provide their customers a sufficient quantity of clean, safe water in a cost-effective manner - now and into the future. Vermont’s systems need to ‘dig deep’ and invest more in drinking water infrastructure and materially commit to using standardized financial and managerial systems practices and approaches to operate, maintain, repair, rehabilitate, and replace outdated and no longer useful assets. State and federal governments need to invest more to assist very small to medium sized Public water systems too. In Federal Fiscal Year 2020, the federal capitalization grant and state match that fund Vermont’s Drinking Water State Revolving Loan Program was \$11,011,000. But this is not enough, the funding needs for PWS infrastructure replacement, operations and maintenance continue to grow. Without proper funding, we will not be able to continue to rely on our drinking water infrastructure for disease protection, fire protection, basic sanitation, economic development, and to support our quality of life.

Appendix A.

Capacity Development Initiatives Completed in Previous Years

Capacity Initiative	Target Audience	Notes
Transient Non-Community (TNC) Water Quality Monitoring Project	TNCs	In 2002, the program developed a cost estimate for conducting quarterly compliance monitoring for all TNCs in the state. At the time, TNCs were only taking annual coliform samples. The goal of the project was to help TNCs transition to quarterly monitoring. Using the cost estimate, the TNC Program hired contractors to collect quarterly samples during 2004 and 2005, prepare a sampling plan for each system, and teach staff how to take samples properly. The samples were analyzed at the Department of Environmental Conservation's laboratory.
Board Member Owner Manual	CWSs	The manual outlines the responsibilities and liabilities for PWS board members and includes information on relevant laws, regulations, and policies, and a list of resources. A draft has been prepared.
Engineering Technical Assistance	CWS, NTNC	DWGPD had several engineering firms under contract to provide operational troubleshooting assistance to small public water systems.
Small System Templates and Self-Assessment	CWS, NTNC	Templates for O&M manual and long range plan, and a capacity assessment form was developed. These documents form the basis for some of the individual on-site and group-training sessions provided. Capacity assessments are completed for all loan applicants and are a prerequisite for both planning and construction loan eligibility. Additionally, a customer complaint policy form and How to Form a Fire District guidance document were developed.
Public Service Board (PSB) Technical Assistance	Private, for-profit CWS (regulated utilities)	Beginning in early summer of 2009, DWGPD met with representatives from the PSB and DPS to discuss better coordination between the three entities. The aim is to help the very smallest of regulated public water systems with rate review, tariffs, and reporting. A guidance manual was developed to assist small systems in the rate approval process.
Consolidation Study	CWS	Consolidation Study was replaced with a Facilitation and Mediation contract beginning in June 2008.
Communication Workgroup	All PWSs	A workgroup was formed to evaluate and develop recommendations on mass mailing procedures,

		newsletters, use of the Electronic Bulletin Board, electronic communication with water systems, and general publicity issues. A number of those recommendations were implemented.
Reservoir Water Quality Study	Surface water CWS	The study collected and analyzed data on changes in source water characterization during the year for two small surface water bodies used by public community water systems in Vermont. Field data collection occurred between April 2002 and May 2003 for the Town of Brattleboro and City of St. Albans Water Systems. Data was analyzed and results evaluated and communicated to the participating water systems.
Comprehensive Performance Evaluation Program	CWS	Comprehensive performance evaluations were conducted on three surface water systems.
Small System Engineering Evaluations	CWS, NTNC	An extremely successful initiative and may resume in the future for those systems that did not already receive an evaluation.
Regulation of Consecutive Water Systems and New Water Line Extensions	CWS	Successful passage of H806 to Act 156 An Act Relating to Public Water Systems.
Asset Management Pilot	CWS	The DWGPD and Village of Waterbury, a small drinking water system, collaborated on an asset management pilot project that ended in Spring 2013. The goal of the pilot was to populate CUPSS, the EPA-developed asset management program, using ArcGIS for a more efficient way to enter many hundreds to thousands of assets. The use of GIS to spatially locate and attribute assets for use in CUPSS had never been done successfully. The Village now has the frame work for an Asset Management Program. A report describing the project is available on our website at http://dec.vermont.gov/water/drinking-water/capacity-dev/publications-and-resources/archived-documents
Determination of non-profit status	Loan Applicants	The DWGPD was given the authority to determine if a water system was not-for-profit without being a tax-exempt (through the IRS) entity. This distinction is beneficial in it reduces a potentially significant time and money delay in the DWSRF loan process
WaterSense Pilot	NTNC	The Orange Center School has a history of seasonal water outages. It appeared that the problem might be solved through water conservation efforts. So

		the school was awarded a grant in 2012 to purchase and install new WaterSense labeled toilets and faucet aerators, and a new dishwasher. The fixtures helped significantly reduce water use and the school was able to stop hauling water temporarily.
Drinking Water & Groundwater Protection Division Newsletter- Waterline	All PWSs, Consultants, interested organizations	This is an effective means for communicating to a broad audience interested in hearing from the state on issues affecting public water systems. We have received feedback from readers that is highly supportive of the newsletter.
Legal Assistance	Community (CWSs) and non-transient non-community (NTNCs) DWSRF loan recipients	Pays for legal services associated with DWSRF loan closings. Also pays for legal reviews for systems using DWSRF monies to purchase land or to acquire, merge with, or purchase another system.
Flood Vulnerability Assessments	CWSs	FED hired a temporary employee to help CWSs 1) assess the vulnerability of their infrastructure to natural disasters (focus mainly on flood and erosion hazards); and 2) identify ways to reduce risks and improve resiliency to natural disasters.

Appendix B.

Vermont Drinking Water and Groundwater Protection Division

Public Water Operator Certification Program

Annual Report for Calendar Year 2019

May 14, 2020

This 2019 Public Water Operator Annual Report documents Vermont’s program compliance with the EPA Public Water Operator Certification Guidelines for the calendar year ending December 31, 2019.

Appendix B of this document is extracted from the March 17, 2020 Vermont Water Supply Rule (Chapter 21 of the DEC Environmental Protection Rules). Section 12.1 of the Vermont Water Supply Rule (Rule) requires that all public water systems shall be operated by a certified operator of the appropriate class. This includes Public Community, Non-Transient Non-Community, Transient Non-Community drinking water systems and Domestic (in-state) Bottled Water Systems. Section 12.2 of the Rule establishes the responsibilities and duties of the owner of the water system. Under Section 12.2.1.2 the owner shall be a certified operator or shall designate a certified operator to carry on the daily operations of the system.

This 2019 Annual Report provides information for the 9 baseline standards described in the 1999 EPA guidelines.

1. Authorization

The US Environmental Protection Agency published guidelines for the “Certification and Recertification of the Operators of Community and Non-Transient Non-Community Public Water Systems” in February 5, 1999. Vermont adopted revised rules in the Vermont Water Supply Rule on December 29, 2000 to comply with the EPA guidelines. EPA approved the State of Vermont Operator Certification Program on February 14, 2001. The Vermont Public Water Operator Certification Program continues to be implemented at the same level as previous years. No statutory or regulatory changes were made to the Program in 2019. In 2019 and 2020 there were revisions to the Vermont Water Supply Rule, they were targeted updates for state programmatic reasons. There were no changes to the operator certification requirements in the Rule following these revisions.

2. Classification of Systems, Facilities, and Operators

Public water systems in Vermont are classified based on indicators of potential health risk which include complexity, size, source water for treatment facilities and size for distribution systems. Specific operator certification and renewal requirements have been developed for each level of water system classification. System Classification and Operator Certification requirements are addressed in Section 12 of the Rule. This section includes the method for determining each of the five classes (Class 1, 2, 3, 4 & D) of public water systems and drinking water facilities, requirements for operator certification and operator certification renewal. See Section 12.8 in Appendix B for the methods to determine a Public Water System class. Tables 1 and 2 below identify the number of operators per each class and the number of water systems per each class respectively as of 12/31/2019.

TABLE 1

Certification Class	1A	1B	2	3	4A1	4A	4B	4C	D	TOTAL
Fully Certified Operators	468	129	259	151	2	9	52	78	63	1211
Operators in Training	-	-	10	11	-	2	4	5	7	39
Grandfathered Operators	-	-	16	6	-	4	3	5	5	39

TABLE 2

Water System Class	Total Number of Water Systems Per Class	Number of Water Systems by Type
1A	529	All TNC
1B	132	All TNC
2	490	TNC – 1 NTNC – 214 CWS - 275
3	173	TNC – 52 NTNC – 30 CWS - 91
4A1	3	TNC - 3
4A	14	TNC – 5 NTNC – 2 CWS - 7
4B	20	TNC – 3 CWS – 17
4C	13	All CWS
D	9	All CWS

The Rule requires all Public Community, Domestic Bottled, and Public Non-Transient Non-Community water systems to have a designated certified operator in responsible charge available at all times. “Available” means based on size, complexity, and source water quality, a certified operator must be onsite or able to be contacted as needed to initiate the appropriate action in a timely manner. Per Section 12.2 of the Rule, the owner of any CWS or NTNC is required to place the direct supervision of the water system under the responsible charge of the designated certified operator. The owner shall place the certified operator in responsible charge of all quality, quantity, process control, and system integrity decisions involving public health, treatment, storage, distribution, and standards compliance. The certified operator is required to hold a valid certification equal to or greater than the classification of the treatment facility and distribution system. A Provisional Certification may be issued when a specific public water system has exhausted all reasonable efforts in recruiting a fully certified operator, and the applicant for the Provisional Certification has obtained a passing grade on the operator examination for the particular water system class. An operator with a Provisional Certification can only operate the specific water system applied for. There are currently no operators with a Provisional Certification in Vermont. Vermont uses the Safe Water Operator Certification System (SWOCS) to track operator certification details, including which public water systems each operator is identified as the designated operator in responsible charge. We have created a public website (<https://anrweb.vt.gov/DEC/DWGWP/Search.aspx>) where operators can check on their certification status including the certification expiration date and how many TCH’s we have on file for them towards recertification.

The Operator Certification Officer runs a report monthly to identify community and non-transient non-community systems without a certified operator. On a regular basis, Transient Non-Community program staff will run queries to identify which TNC water systems do not have certified operators and will reach out to those systems. Table 3 identifies the number of public water systems without a certified operator in responsible charge as of December 31, 2019.

TABLE 3

System Type	Number of Systems	Number of Systems With No Certified Operator as of 12/31/19
Community	412	9
Non-Transient Non-Community	246	4
Transient Non-Community*	725	29

* TNC certification is not mandated by EPA.

3. Operator Qualifications

In order to be eligible to obtain an Operator Certification in Vermont, the applicant must complete the following:

- Submit a complete operator certification application form;
- Have a high school diploma or a general equivalency diploma (GED);
- Obtain the minimum years' operating experience required for the class certification applied for (see Table 4);
- Classes 2, 3, 4 and D must pass the corresponding examination for the class. A minimum score of 70% or higher is required to pass;
- Pay the required fee (class 1A and 1B are \$45 and all other classes are \$80); and
- Satisfy all other state mandated requirements for professional licensing and certification.

Substitutions with related schooling or courses can be made for operating experience as described in Section 12.9.4 of the Rule with the limitation that 50 percent of the required experience must be met by onsite operating experience in a plant, system, or facility.

TABLE 4

Class of Operator	Years Operating Experience Required
Operator in Training (OIT)	NONE
Provisional	NONE
1A	NONE
1B	NONE
2	1.5
3	1.5
4A1	2
4A	2
4B	2.5
4C	3
D	1.5

In 2019, Vermont class 2, 3, 4 and D exams were administered in the spring and fall (May 3, 2019 and November 1, 2019) at two different locations (Berlin and Rutland, VT) on the same day. There were 55 individuals who took an exam in May and there were 45 individuals who took an exam in November. The results for 2019 are summarized in Table 5 below.

TABLE 5

Test Class	Class 2	Class 3	Class 4	Class D
Total Examinees	27	27	21	25
Number of passing grades	23	19	11	15
Percent Passing	85	70	52	60

It is our goal to complete an internal review of the customized exam for each operator classification every three to five years. These reviews may not warrant changes but will ensure the exams are still fair and accurate. As part of the review, the certification team consults with subject matter experts such as Division scientists and operations specialist to validate existing questions and/or develop new questions as necessary. A detailed review of the Class 2 exam occurred in the winter of 2016. During 2017 a couple minor revisions were made to the Class 2 Exam. After reviewing the updated ABC standardized exams for Classes 3, 4, and D, a determination was made that they are not a good fit for the Vermont certification program and therefore, a Vermont customized ABC exam is used for these certification classes. The Vermont state-specific Class 3, 4, and D exams were revised in 2017 and into 2018 to be more aligned with the Vermont program and to reflect regulatory updates since the last time the exams were reviewed.

Vermont has not grand parented operators since 1992 when we adopted the initial operator certification rules with the exception of three operators who own TNC's in 2016, two of which did not renew their certification in 2019. The circumstances regarding these three individuals were described in the *Vermont Drinking Water and Groundwater Protection Division Public Water Operator Certification Program Annual Report for Calendar Year 2018*. The goal of grand parenting was to assist those operators already operating public water systems at the time of implementation of the governing regulations to become certified. All grand parented operators are required to maintain their renewal credits for their class each renewal cycle and may only operate those water systems they were linked to as of 1992; they may not operate other water systems. We currently have 39 grand parented operators in our certification database (SWOCS).

4. Enforcement

The Operator Certification Officer runs a report monthly to identify community and non-transient non-community systems without a certified operator. The Division's Operator Certification Officer continues to work closely with new and delinquent community and non-transient non-community water systems to help them obtain a certified operator. The Operator Certification Officer will contact these systems and follow up with an initial warning letter, if necessary. The water system has thirty days to notify the Drinking Water and Groundwater Protection Division in writing of their certified operator. If the system does not obtain a certified operator, we will issue a Notice of Alleged Violation (NOAV) shortly after the thirty-day period. At this stage, most water systems comply with the NOAV. If the system still does not obtain a certified operator, we will refer the system to the Agency of Natural Resources Office of General Council, Enforcement and Litigation Section for further action. The TNC program staff oversees the management of certified operators within the 1A and 1B classes. On a regular basis, Transient Non-Community program staff will run queries to identify which TNC water systems do not have certified operators and will reach out to those systems. For those systems that do not assign an operator, a NOAV will be issued. Should a system fail to comply with the NOAV, the program will consider pursuing enforcement. In 2020 the General Permit for operation of a Class 1A and 1B TNC water system expired. As part of that process, all eligible water systems must submit a Permit application. One of the criteria to be determined to be eligible for operation under the General Permit is having a validly certified operator of the appropriate class.

Most community and non-transient non-community water systems without certified operators have this status because their operators fail to renew their certification on time, an operator leaves the system, they are actively working to obtain a new operator, or the system is making changes and will be inactivated as a public water system. Table 6 summarizes the number of no operator letters and NOAVs sent to water systems, in addition to the number of systems that obtained an operator following receipt of an NOAV in 2019. Table 3 above summarizes the total number of water systems without a certified operator as of the end of 2019. The one Revised Contempt Order issued in 2019 relating to not having a certified operator has not been resolved.

TABLE 6

Water System Type	Number of Systems Which Received A No Operator Letter	Number of Systems Which Received an NOAV for Failure to Have an Operator	Number of Systems Which Obtained an Operator Following NOAV
CWS	4	0	-
NTNC	5	1	1
TNC	23	30	17

The Agency of Natural Resources has the authority to revoke or suspend an operator’s certificate. Failure to comply with the regulations may require revocation or suspension. The Agency will determine what requirements, if any, will need to be taken in order to reapply for a certification after revocation. Applicants have the right to appeal a revocation or suspension as provided in 10 V.S.A., § 1680. In calendar year 2019 no operator’s certification was revoked or suspended.

5. Certification Renewal

Vermont has a fixed three-year cycle of renewals for Operator Classifications 2, 3, 4 and D. The current renewal cycle for Class 2 and 4 operators is July 1, 2017 through June 31, 2020. The current renewal cycle for Class 3 and D operators is July 1, 2019 through June 31, 2022. Therefore, Class 2 and D Operators must renew their certification in 2020. Operator Classification 1 (includes 1A and 1B) also have a three-year renewal cycle which, unlike the other classifications, is on a rolling basis with the certification period beginning the date issued and expiring on June 30th of the third year. Fifty operators with a Class 1 certification renewed their certification in 2019.

It is the responsibility of the operator seeking renewal to submit an application to renew their certification at least 30 days prior to the expiration date. This allows time for review of the application and to either approve it or to notify the applicant of any deficiencies prior to their current certification expiring. Documentation of continuing education must be provided prior to the certification being renewed. Acceptable documentation consists of individual course completion certificates or formal course sign-in sheets containing the signature of the applicant confirming attendance. The courses must have been pre-approved for drinking water operator certification in order to be given credit towards the renewal. There are currently 39 grandfathered operators, all who must meet the continuing education requirement for their certification class in order to renew. Table 7 summarizes the continuing education required for each certification class. There are no operators in Vermont who the State requires additional training to recertify other than what is required in the Rule.

TABLE 7

Class of Certification	Duration of Certification (years)*	Recertification Requirement
1A	3	Recommended 3 TCH
1B	3	3 TCH
2	3	Retesting or 10 TCH
3	3	Retesting or 20 TCH
4 (A1, A, B, C)	3	Retesting or 20 TCH
D	3	Retesting or 20 TCH

*certifications may be for fewer than 3 years in order to stagger the renewal dates for more efficient administration of the program.

Any operator who fails to renew their certification within sixty days following the expiration may not receive a new certificate until they have successfully passed the qualifying examination and meet the requirements set

forth in Section 12.3.1 of the Rule. There were no operators that recertified in 2019 after failing to previously renew or qualify for renewal.

The Vermont operator training program is coordinated through a contract with the Vermont Rural Water Association (VRWA). Communication between the VRWA Coordinator and Drinking Water and Groundwater Protection Division Operator Certification staff occurred frequently throughout the year. Through this contract, courses were held in various locations throughout the state to reach all water systems. The attendance for each class ranged from 1 - 86 participants (depending on location).

Additional courses were provided at locations in Vermont by other training providers including Earth Water Specialists, Green Mountain Water Environment Association (GMWEA), New England Water Works Association (NEWWA), RCAP Solutions, and the Vermont Department of Environmental Conservation. There was a total of 138 different approved courses offered for credit towards Vermont operator certification in 2019.

In December 2017, Vermont issued a request for proposals for a new operator training contract to commence May 1, 2018. Being the sole applicant, VRWA was selected for the contract period between May 1, 2018 and April 30, 2019. This contract was amended to extend the contract from May 1, 2019 through April 30, 2020. They are eligible for one additional one-year extension to the contract from May 1, 2020 through April 30, 2021. A copy of the current contract with VRWA and the contract amendment are attached.

Courses for Vermont Water Operators are publicized on our website, <http://dec.vermont.gov/water/drinking-water/pwso/operator-training> and training provided by VRWA is publicized quarterly in print and is regularly updated on their website: <http://vtruralwater.org/training/>. This includes both in-class and online training courses. In calendar year 2019, approximately 6948 training contact hours were awarded to water professionals through classes provided throughout the state and through online training courses. Approximately 82% of these training contract hours were awarded by VRWA. Details of the training provided by Vermont Rural Water Association in 2019 are listed in Appendix A. Note that not all training contact hours in Appendix A were awarded to water professionals.

Review and approval of training courses occurred throughout the year except for VRWA, GMWEA, NEWWA, Earth Water Specialists, and NEIWPC which have “blanket approval” for in-class courses they provide.

On-line training courses by the following training providers have been approved for water system operator TCHs. No more than 50% of water system operator renewal credits may be earned from on-line courses per renewal cycle.

- [AYPO Tech, LLC](#)
- [CEUplan.com](#)
- [Michigan State University Water Management Courses](#)
- [Vermont Leagues of Cities and Towns, PACIF Online University](#)

There is one online provider approved for Class 1 operator certification only:

- [Arizona Operator Core Competencies course through waterhelp.org*](#)

*Credit for Class 1 operators only. Must complete Source, Process Control, and Safety modules to receive 3 TCH

All other courses by training organizations and providers, including any distance learning training, must be pre-approved using a pre-approval form taking into account our pre-approval guidelines. Courses must be relevant to operation or management of water systems. We accept a wide spectrum of topic areas from basic to advanced topics. Training topic areas include a range of technical training including safety, capacity, equipment mechanics, and drinking water rules. We also provide training classes for new operators of small systems, systems with advanced treatment and system with distribution only prior to those operators taking their respective certification exam.

6. Resources Needed to Implement the Program

Vermont continues to adequately fund and sustain the operator certification program. There is no single full-time staff person dedicated to the operator certification program and at times, several Division staff are contributing to the certification program. Work is primarily performed by two staff including the Operator Certification Coordinator and an Environmental Technician. In 2019, the Operator Certification Coordinator spent approximately 23% of his time on technical review of certification applications, approval of classes for TCH credit, coordinate/proctor/administer exams, participate in the certification committee and outreach. The Environmental Technician spent approximately 45% of his time providing various administrative services and general outreach. Other staff including the Compliance and Support Section Chief, Compliance and Certification Manager, and other Compliance Analysts in the Division contributed to managing contracts, proctoring/administrating exams, developing and providing trainings and providing outreach.

There is no charge for operators to take the Class 2 Exam since the exam is owned by the State. There is a \$42 fee for class 3, 4, and D exams to cover the cost for ABC to provide the Vermont customized exams. A fee of \$45 for Class 1 (both 1A and 1B) and \$80 for all class 2, 3, 4, and D is required for all initial and renewal certifications. The Division continues to use DWSRF money to fund operator training provided by the Vermont Rural Water Association (VRWA). More information regarding the training provided by VRWA under this contract is identified in the *certification renewal* section above. A list of courses provided by VRWA in 2019 is included in Appendix A.

Due to the limited functionality of SWOCS, the Division is currently working with State IT staff to develop a replacement database. The new database will be custom-built to meet the needs of the Vermont certification program. The Division has already increased public access to operator information by creating the public website as discussed in the *Classification of Systems, Facilities, and Operators* section above.

7. Recertification

Any operator who fails to renew his or her certificate within sixty days following the expiration date of the certificate, will not receive a new certificate until he or she successfully passes the qualifying examination and meets all the requirements in Section 12.3.1 of the Rule (see 3. Operator Qualifications above for the list of requirements).

8. Stakeholder Involvement

Vermont meets the stakeholder involvement standard through ongoing meetings with the Operator Certification Advisory Committee. The committee is made up of Agency staff, Vermont certified water operators, VRWA staff, and RCAP Solutions staff. The committee met on February 22, June 28 and October 11, 2019. The focus of the meetings has been on generating draft revisions to Subchapter 21-12 – Water System Classification and Operator Certification of the Vermont Water Supply Rule. Ongoing topics discussed by the committee include:

- Discussed tasks that an operator must perform and tasks the operator can delegate.
- Discussed if there should be a core curriculum that all operators must meet in order to be recertified. This included further discussion of different “bins” that each approved continuing education course would fit into and an operator would need to meet the minimum number of TCH’s for each bin in order to become recertified. The goal would be to ensure a diversity of relevant training is being achieved for each operator.
- Discussed if water systems with a treatment classification (i.e. 2, 3, or 4) should also be required to have a class D endorsement. The thought behind this is that some water systems are classified to their treatment capability but also have an extensive distribution system which may include multiple pressure zones, storage tanks, etc.. This recognizes that the operation and maintenance of a distributions system is a different skill set than the operation and maintenance of a treatment system. Having someone

certified with a D endorsement ensures that a person knowledgeable in distribution system operation and maintenance is in responsible charge of that portion of the water system.

- Discussed if the current classification of water systems and if they reflect the expertise required to properly operate the water system. Things considered were if the contaminant being treated is primary or secondary, if treatment is required, and how the population affects this class.
- Discussed impacts to a designated certified operator's license following prolonged system non-compliance.

Committee meetings will continue moving forward as we work to revise the Rule and to address other operator-related issues as they arise. Any changes to the operator certification program will be discussed in advance with EPA Region 1 Operator Certification Contact to ensure that our program continues to meet the baseline standards and implement EPA's Final Guidelines for the Certification and Recertification of Operators of Community and Non-Transient Non-Community Public Water Systems.

9. Program Review

The program review occurs during the ongoing meetings with the Operator Certification Advisory Committee. The committee is made up of both internal and external individuals which help steer the direction of the state's operator certification program. The focus of the committee over the last several years is the comprehensive revision to Subchapter 21-12 – Water System Classification and Operator Certification of the Vermont Water Supply Rule.

Appendix A – Water Operator Training provided January 1, 2019 – December 31, 2019

Month	Vermont Rural Water Association Training Sessions January 1, 2019 – December 31, 2019 Course Title	TCH	# of attendees	TCHs Awarded
Jan	Optimizing your Pump Station - Rutland	3	22	66
	Understanding your Motor Control Panels	4	18	72
	Corrosion Control – Essex Jct.	3	14	42
	Sampling Seminar - Burlington	4	13	52
	Operational Ethics (4hr) - Newport	4	14	56
	TNC Operations - Berlin	3	13	39
	Chemistry with Jar Testing - Montpelier	6	17	102
	Basic Excel – Essex Jct.	3	10	30
	Sampling Seminar – White River Jct.	4	22	88
Feb	TNC Operations - Ludlow	3	13	39
	Basic Excel - Newport	3	9	27
	Math – Essex Jct.	3	11	33
	Advanced Water Treatment (Class 3&4) – Montpelier	15	14	184*
	Distribution (Class D) - Montpelier	15	9	135
	TNC Sampling - Colchester	3	17	51
Mar	Distribution Course - Montpelier	15	9	125*
	Advanced Treatment – Montpelier	30	14	419*
	Metering – Essex Jct.	3	21	63
	System Sustainability	4	19	76
	Sampling Training - Newport	3	16	48
	Basin Math - Rutland	3	19	57
Apr	Operations Refresher Course – Essex Jct.	4	11	44
	Small Systems Class 2 Course - Montpelier	18	13	234
	Metering - Rutland	3	16	48
	Small Systems Class 2 Course - Ludlow	18	4	72
	VOSHA - Newport	6	24	144
	Sample Training Course – Essex Jct.	3	18	54
	TNC Operations Course - Lyndonville	3	6	18
	Ethics - Rutland	4	13	52
	Ethics - Bethel	4	15	60
	VOSHA - Bennington	6	23	138
	VOSHA – Essex Jct.	6	20	120
	Exam Prep Class 3, 4 &D - Montpelier	4	8	32
	Small Systems Class 2 Exam Prep - Bethel	4	7	28
May	VOSHA – White River Jct.	6	24	144
	Onsite – Leak Detection & Line Locating – St. Johnsbury	3	7	21
	VRWA Annual Conference Trainings:			
	Controlling your Systems: SCADA	1	67	67
	USDA and DEC Funding	1.5	32	48
	Management Issues in the 21 st Century	1.5	86	129
	Navigating Procedures in OPR for Operators	1	32	32
	Canaan Water System Upgrade	1	63	63
	Onsite – Leak Detection & Line Locating - Lyndonville	3	8	24
	Water and Wastewater Ethics - Bennington	4	18	72

	Water System Sampling Training – West Rutland	3	17	51
	TNC Operations - Bennington	3	11	33
June	Pumps and Pumping - Derby	4	2	8
	Replacement Planning of Distribution Lines - Rutland	3	16	48
	VEC Conference - Randolph	5	20	100
	Leak Detection and Line Locating - Montpelier	4	17	68
	TNC Operations - Middlebury	3	5	15
	Leak Detection and Line Locating - Newport	4	10	40
	Line Locating & Leak Detection - Montpelier	3	3	9
	Effective Utility Management - Derby	5	4	20
	Corrosion Control - Swanton	3	8	24
	Replacement Planning of Distribution Lines	3	16	48
	Line Locating and Leak Detection - Montpelier	8	1	8
	Jar Testing - Bennington	6	19	114
	Cyanobacteria Training - Burlington	2	16	32
RTCR - Montpelier	3	6	18	
July	Basic Math – Essex Jct.	3	3	9
	Optimize your Pump Stations - Chelsea	4	3	12
	Optimizing your Pump Station - Rutland	4	1	4
	Chemical Feed Pump – North Hero	3	10	30
	Chemicals of Water Treatment – Essex Jct.	3	16	48
	Lead in Schools and PFAS Sampling – Bethel	4	19	76
August	Corrosion Control - Bennington	3	4	12
	PFAS & Lead in School – Essex Jct.	4	47	188
	Basic Math - Newport	3	4	12
	PFAS & Lead in School - Newport	4	17	68
	Ethics – Essex Jct.	4	16	64
	PFAS & Lead in School - Bennington	4	57	228
September	Advanced Treatment (Class 3&4) - Rutland	30	13	375*
	Distribution (Class D) - Rutland	30	5	150
	PFAS & Lead in School - Berlin	4	42	168
	How to Handle the Media – Essex Jct.	4	16	64
	Optimize your Pump Station – St. Albans	3	14	42
	Understanding your Motor Control - Milton	4	12	48
	PFAS & Lead in School - Milton	4	29	116
	Basic Math Course – Essex Jct.	3	10	30
October	Advanced Treatment (Class 3&4) - Rutland	15	13	180*
	Down Well Camera Exploration – East Burke	3	8	24
	Pipe Asset Management Tools - Burlington	4.5	13	58.5
	Small Systems Class 2 - Montpelier	18	9	130.5*
	Small Systems Exam Prep – Essex Jct.	4	3	12
	Advanced Class 3 & 4 Exam Prep - Rutland	4	14	56
November	Basic Excel – Essex Jct.	3	7	21
	VOSHA - Montpelier	6	20	120
December	Surface Water Treatment	7	24	168
VRWA 2019 Total:		490.5	1449	6598

*Some attendees did not attend all classes

Appendix B

AGENCY OF NATURAL RESOURCES DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ENVIRONMENTAL PROTECTION RULES

CHAPTER 21

WATER SUPPLY RULE

REVISION DATE: March 17, 2020

Introduction

This subchapter applies to the following **Public** water systems:

- (a) **Public Community** water systems;
- (b) **Public Non-Transient Non-Community** (NTNC) water systems;
- (c) **Public Transient Non-Community** (TNC) water systems; and
- (d) **Domestic Bottled** water systems.

12.1 General

All **Public** water systems shall be operated by a certified operator of the appropriate class as defined in this subchapter. A certified operator is one who has met the requirements of this subchapter and has a current, valid certification from the Secretary.

All **Public Community**, **Domestic Bottled**, and **Public Non-Transient Non-Community** water systems must have a designated certified operator in responsible charge available at all times. “Available” means based on system size, complexity, and source water quality, a certified operator must be on site or able to be contacted as needed to initiate the appropriate action in a timely manner.

For purposes of certifying **Public** water system operators, each **Public** water system shall be classified according to degree of treatment, and in the case of Class 4, according to size of population served. The class of operator certification required is dependent upon the classification of such facility.

There are five classes of water systems. Classes 1, 2, 3, and 4 apply to water systems with their own source(s) of supply, and Class D applies to systems which distribute water.

12.2 Responsibilities and Duties

12.2.1 Owner’s Responsibilities

12.2.1.1 The owner shall be responsible for compliance with the federal Safe Drinking Water Act, Vermont statutes, and the regulations developed pursuant to both.

12.2.1.2 The owner shall be a certified operator or shall designate a certified operator(s) to carry on the daily operations of the system. Such designation shall be in writing and shall be signed by both the certified operator and the owner. A copy of the written designation shall be made available to the Secretary upon request.

12.2.1.3 The owner of any **Public Community** or **Non-Transient Non-Community** water system shall place the direct supervision of the water system under the responsible charge of the designated certified operator(s) (see Subsection 12.2.1.2). The owner shall place the certified operator(s) in responsible

charge of all quality, quantity, process control, and system integrity decisions involving public health, treatment, storage, distribution, and standards compliance. The certified operator shall hold a valid certification equal to or greater than the classification of the treatment facility and distribution system.

12.2.2 Certified Operator's Responsibilities

The certified operator shall comply with the following requirements as a condition of his or her certification:

- (a) The certified operator(s) in responsible charge must hold a valid certification equal to or greater than the classification of his or her water system, including each treatment facility and distribution system, as determined by the Secretary.
- (b) The operator in responsible charge shall perform the following duties:
 - 1. Conduct visual inspections of the system's source, source water protection area, storage facilities, and chemical addition systems at an appropriate frequency giving consideration to the system's design, location, vulnerability, Operations and Maintenance Manual (see Appendix D), and other relevant factors.
 - 2. Be familiar with all aspects of the treatment and distribution system operation of the water system.
 - 3. Oversee all bacterial monitoring, chemical monitoring, and other monitoring required under this Rule.
 - 4. Review the sample monitoring schedule and locations quarterly.
 - 5. Ensure that all samples are delivered to a certified laboratory in a timely manner.
 - 6. Inspect system within 24 hours of any positive fecal coliform result, positive Total Coliform repeat sample result, or other water system failures that threaten public health.
 - 7. Notify owner of any violation(s) of this Rule.
 - 8. Ensure the accuracy of water meters and other flow measuring devices.
 - 9. Be responsible for measuring, and recording chemical additions.
 - 10. Operate and maintain chemical feed and all treatment systems.
 - 11. Keep abreast of changes in the drinking water regulations and safety regulations.
 - 12. Fulfill certification and certification renewal requirements.
 - 13. Operate and maintain system in accord with the Operation & Maintenance Manual.
 - 14. Attend all inspections as requested by state personnel.
 - 15. Oversee source water protection, watershed protection, and other activities associated with chemical waivers or otherwise required by this Rule.
 - 16. Keep complete and accurate water system records.
 - 17. Carry out all required reporting requirements including submitting a complete monthly report to the Secretary by the 10th day of the following month.
 - 18. Develop and maintain an accurate site plan showing the water source and distribution system.
 - 19. Respond to consumer complaints promptly.
 - 20. Comply with all applicable state and federal statutes, rules and orders governing water system regulation.
 - 21. Conduct all duties with reasonable care and judgment for the protection of public health, public safety, and the environment.

12.3 Operator Certification

12.3.1 To be eligible for operator certification, each applicant must:

- (a) Submit an application on a form provided by the Secretary;
- (b) Meet the educational and experience requirements set forth in Section 12.9;
- (c) Classes 2, 3, 4 and D shall obtain a passing grade on the certification examination approved by the Secretary (Class 1 operators need registration only);

- (d) Pay any required fee; and
- (e) Satisfy all other state mandated requirements for professional licensing and certification.

12.3.2 When replacing an operator, the water system owner shall notify the Secretary in writing within ten (10) days following the date an operator ceases operation of a plant or system, and within ten (10) days after a new operator commences operation of a **Public** water system.

12.3.3 Whenever a new **Public** water system is constructed, the water supplier shall employ or contract with an operator certified in the corresponding class for the new facilities.

12.3.4 When significant modifications are made to an existing **Public** water system which change the system's classification, the operator(s) shall obtain a new certificate as required by the improvements.

12.3.5 An operator holding a certification in any class is permitted to operate all facilities in that class and any lower class. Class 4C is the highest Vermont water operator class. This paragraph does not apply to Class D (distribution only).

12.3.6 A certified operator may move from any **Public** water system class to the next higher one if he or she satisfies all of the following:

- (a) the operator has obtained a passing grade on the examination of the higher class; and
- (b) he or she has worked as an operator-in-training for six months in the next higher class. One year as an operator-in-training shall be required before advancing two or more classes.

12.3.7 Applicants who did not obtain a passing grade on a written certification examination for a class may be retested at any scheduled examination for the particular class.

12.3.8 In the event an operator's certification is denied, the Secretary will provide the applicant with written notification of the reasons for such denial. Applicants may appeal the denial in accordance with the provisions of 10 V.S.A., §1680.

12.3.9 The operator's certification shall be displayed in the office or plant of the system, and provided for inspection upon reasonable request.

12.4 Revocation or Suspension of Operator Certification

- (a) The Secretary may suspend or revoke a certificate granted under this section, after notice and opportunity to be heard, if the Secretary finds that the certificate holder has:
 - (1) submitted or contributed to the submission of materially false or inaccurate information; or
 - (2) violated any material requirement, restriction, or condition of the certificate including:
 - (i) the violation of any applicable statute, rule, or order governing water system regulation; and
 - (ii) the failure to use reasonable care and judgment in the performance of the operator's duties.

The Secretary shall set forth what steps, if any, may be taken by the certificate holder to reapply for certification if a previous certificate has been revoked.

- (b) The applicant may appeal a revocation or suspension as provided in 10 V.S.A., §1680.

12.5 Recertification of Expired Certificates

Any operator who fails to renew his or her certificate within sixty days following the expiration date of the certificate may not receive a new certificate until he or she successfully passes the qualifying examination and meets the requirements set forth in Section 12.3.1.

12.6 Operator-in-Training (OIT)

12.6.1 An Operator-in-Training (OIT) certification is required to operate a **Public** water system under the direct supervision of a certified operator and may be granted by the Secretary. Application must be made on a form supplied by the Secretary.

12.6.2 Upon written notification by the OIT's supervisor that the OIT has completed the minimum required operational experience for full certification in the appropriate water system, the Secretary may issue the appropriate operator certificate provided the OIT has satisfied all operator certification requirements of this part.

12.7 Provisional Certification

12.7.1 A Provisional Certificate may be issued by the Secretary to an applicant for the operation of a specific water system when the applicant has not met the full certification requirements for experience in that water system class. A Provisional Certificate may be issued provided the specific water system has exhausted all reasonable efforts in recruiting a fully certified operator, and the applicant has obtained a passing grade on the operator examination for the particular water system class.

12.7.2 The Provisional Certificate Application shall be co-signed by the applicant and the owner for the water system which will be served by the provisionally certified operator. The owner of the water system shall certify that the applicant has had operator training by the manufacturer, consultant, or other certified operator and is capable of operating the specified water system. The Provisional Certificate has the following restrictions:

- (a) It shall be issued for operation of a single, specific water system;
- (b) It shall be valid only for a time period equal to the minimum operating experience requirements identified in Table 12-1 of Section 12.9; and
- (c) It shall be non-transferable.

12.7.3 To convert from a Provisional to a Full Certificate, applicants must:

- (a) present evidence of having been employed in a particular water system for a specific amount of time, to include all time in training with equipment manufacturers, consultants, or other certified trainers/operators (see Table 12-1, of Subsection 12.9; and
- (b) present evidence of having obtained a passing grade on an examination for the particular classification being sought and evidence that all other certification requirements have been met (see Subsection 12.2.1).

12.8 Classification of Public Water Systems and Drinking Water Facilities

Each **Public** water system is to be classified by the Secretary as set forth in this rule. There will be five classes, 1 through 4 and D.

12.8.1 Class 1A

This class of **Public** water system includes **Transient Non-Community** water systems with distribution and using any of the following technologies

- (a) No treatment;
- (b) Ion exchange for water softening; or
- (c) Limestone contactors.

12.8.1.1 Class 1B

This class of **Public** water system includes **Transient Non-Community** water systems with distribution and using any of the following technologies:

- (a) Disinfection with chlorine or UV, including standby capability.

12.8.2 Class 2

This class of **Public** water system includes **Public Community, Bottled, and Public Non-Transient Non-Community** water systems with distribution and any of the following technologies:

- (a) No treatment;
- (b) Disinfection with chlorine or UV; includes systems with standby chlorination;
- (c) Ion exchange for softening; or
- (d) Limestone contactors.

12.8.3 Class 3

This class of **Public** water system includes **Public Community, Bottled, Public Non-Transient Non-Community, and Public Transient Non-Community** water systems with distribution and any of the following technologies:

- (a) Disinfection by other than chlorine or UV;
- (b) Sequestering or filtration of manganese or iron;
- (c) Fluoridation;
- (d) Corrosion control;
- (e) pH control;
- (f) Air stripping;
- (g) Granular activated adsorption;
- (h) Ion/anion exchange;
- (i) Aeration; or
- (j) Membrane filtration.

This class also includes all **Public** water systems using groundwater determined to be under the direct influence of surface water and which *have* a filtration waiver.

12.8.4 Class 4

This class of **Public** water system includes all **Public Community, Bottled, Public Non-Transient Non-Community, and Public Transient Non-Community** water systems which use surface water, or which have groundwater determined to be under the direct influence of surface water with respect to which a filtration waiver has not been issued.

12.8.4.1 Class 4A1

This class includes distribution plus any of the following treatment technologies:

- (a) Bag filtration;
- (b) Cartridge filtration;
- (c) Membrane filtration;
- (d) Slow sand filtration; or

- (e) Other similar technologies, as approved by the Secretary, which do not use coagulants.

This class serves all water system populations of 25 or greater.

12.8.4.2 Class 4A, 4B, and 4C

This class includes distribution plus rapid sand filtration technology and is further differentiated by population served by the system:

- 4A, for served populations between 25 and 500;
- 4B, for served populations between 501 and 3,300; and
- 4C, for served populations greater than 3,300

12.8.5 Class D

This class of **Public** water system includes **Public Community** water systems serving 3,300 people or more and that have only a distribution system. A Class D system purchases its water and does not have any source or treatment associated with it.

12.9 Experience and Education

12.9.1 In determining whether an applicant has the operating experience required for certification in a particular water system class, the Secretary may consider the following:

- 1) the period of satisfactory experience as a system operator or OIT; and
- 2) operating experience accrued in another jurisdiction.

All satisfactory experience as noted above shall be credited toward the total experience required for certification in the particular class for which application is made. Operating experience is defined as time spent at a facility, plant, or system in satisfactory performance of operational duties.

12.9.2 All applicants shall have a high school diploma or a general equivalency diploma (GED). The Secretary may allow experience and relevant training to be substituted for a high school diploma or GED.

12.9.3 Table 12-1, below, contains the minimum experience requirements for certification.

Table 12-1 - OPERATOR CLASSIFICATION REQUIREMENTS

Public Water System Class(s)	Class of Operator	Operating Experience Required (Yrs)
ALL	Operator-in-Training(OIT)	NONE
ALL	Provisional	NONE
1A	Operator Class 1A	NONE
1B	Operator Class 1B	NONE
2	Operator Class 2	1.5
3	Operator Class 3	1.5
4A1	Operator Class 4A1	2
4A	Operator Class 4A	2
4B	Operator Class 4B	2.5
4C	Operator Class 4C	3
D	Operator Class D	1.5

12.9.4 Substitutions for Experience Requirements

- (a) Substitutions with related schooling or courses may be made for required experience for Classes 2, 3, 4A1, 4A, 4B, 4C, and D but with the limitation that 50 percent of any stated experience requirement must be met by actual on-site operating experience in a plant, system or facility.
- (b) Formal Education
 - (1) High School education cannot be substituted for any experience requirement.
 - (2) Approved relevant formal academic education at the post high school or college level may be substituted for experience requirement on a year for year basis, subject to the 50 percent limitation described in Subsection 12.9.4(a) above. Thirty (30) semester hours or equivalent educational hours of credit are considered to represent 1 year of formal education.
- (c) Operator Training
 - (1) Specialized operator training courses, seminars, workshops or approved technical conferences may be substituted for experience requirements subject to the 50 percent limitation previously described. Continuing Education Units (CEUs) totaling 30 are considered equal to 1 year.
- (d) Partial credit toward operating experience may be given for experience in plant or system maintenance, in a laboratory, in a different certification category than that which is being applied for, and in related (allied) trades, as determined or approved by the Secretary.

12.10 Certification Renewal

12.10.1 A certified water system operator shall submit to the Secretary, at least 30 days before the expiration date of the certificate, a completed application on the form approved by the Secretary, including any fee due. The Secretary shall review the application and shall promptly notify the applicant of any deficiencies. If the application is complete, the continuing education requirements of Section 12.11 have been fulfilled, and the Secretary finds no cause under Section 12.3 to deny the application, a renewed certificate shall be issued.

The Secretary intends to provide written notice to operators of their certification renewal date approximately 6 months prior to that date. However, the burden of certification renewal is assumed by the applicant and failure of the Secretary to provide notice shall not constitute a basis for contesting the expiration of an operator certificate.

12.10.2 Certification renewal shall occur on a schedule as shown below and shall be based on various methods of recertification depending on water system class.

Class of Certificate	Duration of Certificate, Years	Method of Certification
1A	3	Registration
1B, 2	3	Continuing Education or Retesting
3	3	Continuing Education or Retesting
4A1,4(A,B,C)	3	Continuing Education or Retesting
D	3	Continuing Education or Retesting

12.10.3 Certifications issued under the rule may be for fewer years than shown above, in order to stagger the renewal dates for more efficient administration of the program.

12.11 Continuing Education

12.11.1 Continuing education requirements for certification renewal are as follows.

- (a) Water System Class 1A operators are encouraged to attend at least 3 hours of state approved seminar or other approved instruction each 3 year renewal period.

Water System Class 1B operators shall attend at least 3 hours of a state sponsored seminar or other approved instruction each 3 year renewal period.

- (b) Water System Class 2 operators shall attend at least 10 hours of a state sponsored seminar or other approved instruction each 3 year renewal period.

- (c) Water System Class 3, 4, and D operators shall attend 20 hours of state sponsored seminars or other approved instruction each 3 year renewal period.

12.11.2 Documentation of continuing education shall be reviewed by the Secretary to determine compliance with the continuing education requirements. Documentation will be provided by the applicant for renewal or by the Secretary. Acceptable documentation shall consist of individual course completion certificates (pre-approval of course required) or formal course sign-in sheets for pre-approved courses containing the signature of the applicant confirming attendance.