VERMONT
Department of Environmental Conservation
Drinking Water and Groundwater Protection Division

Vermont's Drinking Water Capacity Development Program Annual Report 2019

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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DRINKING WATER
CAPACITY DEVELOPMENT PROGRAM

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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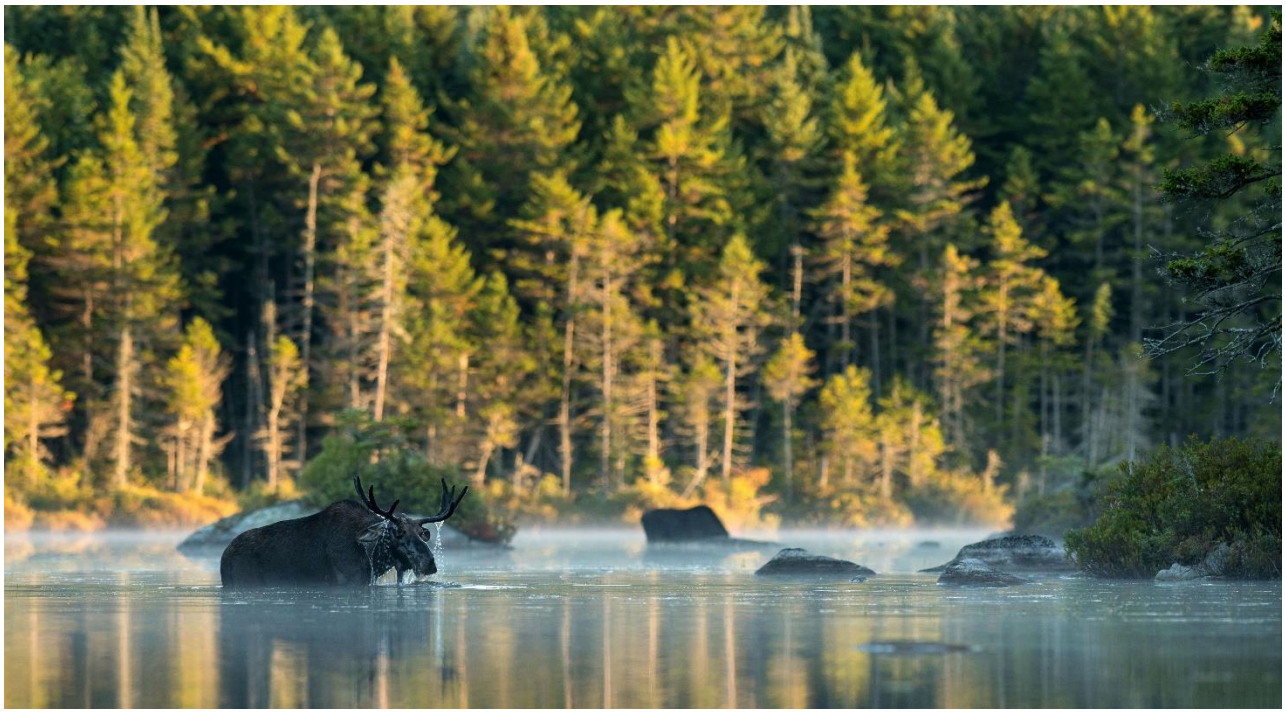


Introduction

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 (DWGWPD, 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.

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):

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 annual report is required by the Environmental Protection Agency (EPA). It provides a summary of the Capacity Program's efforts during state fiscal year 2019 - (July 1st, 2018 thru June 30th, 2019). 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.*

The EPA will use this report to help determine whether Vermont's Capacity Development Program meets the SDWA's statutory requirements. Failure to meet the requirements would result in a 20% withholding from our Drinking Water State Revolving Fund (DWSRF) Capitalization Grant. For example, the grant for federal fiscal year 2019 is $11,004,000, so failure to comply would result in a $2,200,800 penalty.

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 year.

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*

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 – before issuing the construction and operating permits 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.

In 2019, the Capacity Program spent considerable time focusing on daycares that fall into the NTNC category. 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.

Capacity Determinations for New Public Water Systems

The table below lists new systems for which a capacity determination was completed during state fiscal year 2019. 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
VT0000512	DC Lang LLC – Georgia Daycare	NTNC	4/24/2019	Capacity determination completed
VT0020376	Killington Village Water System	CWS	Proposed	Source and Construction permit issued, capacity review process started, project on hold by Water System
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 permit application received; capacity review process started

New System Compliance

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 systems 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.

The DWGWPD uses the Drinking Water Enforcement Tracking Tool (ETT) to help prioritize enforcement actions. The EPA requests that the state include in this annual report the ETT status of CWSs and NTNCs activated during the past three years (see Table 2, below). Systems that exceed a score of ten become an immediate enforcement priority. Those with scores of nine or less are tracked closely. 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	Yes- 7
VT0021446	The Binding Site VT	NTNC	3/16/2017	No

Capacity Development for Existing Public Water Systems

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. On July 28th, 2000 the DWGWPD published its "Existing Public Water System Capacity Strategy". The strategy's five major components are listed in Figure 3. With time, the Capacity Development Program has incorporated other tools. For example, in the last five years, the Program has begun to employ a strategic long-term planning strategy which promotes water systems inventorying and performing condition assessments of their assets and preparing budgets and timelines for infrastructure maintenance and replacement. We believe this strategy will further strengthen and improve systems' technical, managerial, and financial capacity in the short-term and into the future. The DWGWPD began to revise the formal Capacity Development Strategy in 2018 to incorporate this additional focus and expects this updated strategy to be completed in the next year.

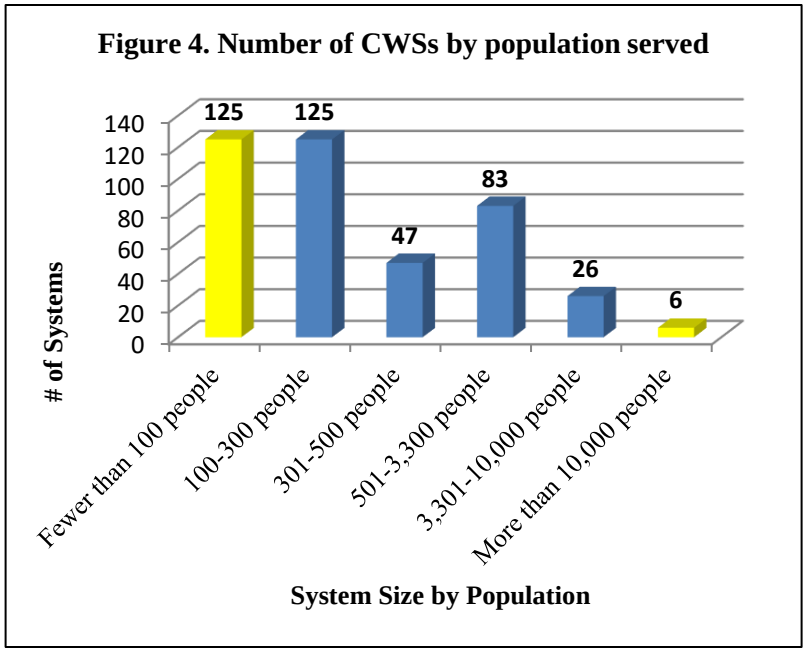
During Fiscal Year 2019, there were 1,390 active public water systems in Vermont, including:

- 412 community systems (CWSs),
- 245 non-transient non-community systems (NTNCs), and
- 733 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.

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.



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 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 2019, staff surveyed 125 CWSs and 115 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. Capacity Development Program staff also 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 and/or financial 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. 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.

Helping Improve Technical, Financial and Managerial Capacity

During the year, 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; financial assistance programs, including low interest and negative interest loans; technical assistance consultations; and source water assessments. The Division continues to develop new capacity development initiatives, while continuing to emphasize Asset Management and Water Loss Control Programs. Some highlights are described below.

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

In a 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.

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 applied 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 had 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. Representatives from 12 community water systems participated in the 2019 workshop series. To date, a total of 55 water systems have attended these trainings.

*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.*

An up-to-date map and asset inventory are the backbone of a successful Asset Management Program. Public water systems often have limited staff time available and creating a detailed inventory can take several years. Water systems can benefit from the development of an Asset Management Program before the asset inventory is complete; however, the time and effort needed to create an inventory often prevents a water system from starting an Asset Management Program. Therefore, 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.

As stated above, in CY2018, the Division's Capacity Development Program transitioned from grants to 100% forgivable planning loans for Asset Management Plans. 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.

Table 3. 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
Level of Service Agreement (Goals and Performance Measures)	19	16	5	4
Asset Inventory and Condition Assessment	27	21	5	4
Maps	19	18	5	4
Life Cycle Cost Analyses	12	17	5	4
Risk Assessments	23	16	5	4
Risk and Cost Reduction Strategies	21	17	5	4
Funding Strategies	19	16	5	4

Drinking Water Lead Reduction Strategies Grants

In early 2017, the Capacity Development Program offered grants to help public CWSs reduce the risks of exposure to lead in drinking water. The purpose of the grants was to help community systems create an inventory of publicly and privately-owned lead service lines and/or other lead-containing infrastructure; develop strategies for removing the lead infrastructure and reducing exposure users; and communicate with system users. The total amount available for the grants was $125,000.

Two community water systems were awarded the Lead Reduction Strategies Grants, Springfield Water Department and Bennington Water Department. These water systems were aware of lead infrastructure within the distribution, but the extent of the lead was undetermined. While Springfield knew they did not have any lead service lines, they were aware of lead goosenecks on 11 streets in the downtown area. Bennington, on the other hand, knew there were partial and full lead service lines within their distribution, but the magnitude of the issue was unknown. While the scope of lead in the two water systems was very different, they both took a similar approach to establishing a more accurate understanding of the challenge they face. 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.

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 fifth consecutive year, the Capacity Development Program has offered free leak detection services to CWSs.

To be considered for the leak detection services, systems had to submit a project request, had to agree to assist with the survey (i.e., preparing maps, locating listening points, exercising valves, etc.), and fix any leaks found.

The 2018 leak detection surveys took place at the beginning of the state's fiscal year 2019, 14 public community drinking water systems received leak detection services. About 94 miles of pipe were surveyed and 37 leaks were identified. An estimated 62 gallons per minute (89,640 gallons per day) of drinking water was being lost through these leaks. Capacity Development Program staff followed up with the systems to ensure that they fixed the leaks or had a plan to do so.

In 2019, 18 systems were awarded a leak detection survey. The surveys are being conducted in accordance with the American Water Works Association's "Water Audits and Loss Control Programs" manual (Manual of Water Supply Practices M36, 3rd Edition, 2009). The surveys were performed in July and August 2019. Five additional days of surveys remain on the contract for services. These days

will be allocated in spring 2020. Table 4, (below), provides a summary of the leak detection surveys conducted from 2014 - 2019.

Table 4. 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*	18	74	44	186,120

*5 days of survey services remain to be used

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-nine Level 2 Site Assessments were completed at CWSs and NTNCs during the last state fiscal year, 22 by assessors, 7 by Division staff.

Free Stand-by Power Evaluations

In CY2018, 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.

As follow-up to the evaluations, the DWGWPD combined four of 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. Regardless of whether a Water System was selected for the second phase or not, having the evaluation puts the Water System in a better position to meet the standby power requirements of the Water Supply Rule.

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

Table 5. 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 A includes a summary of the training provided during the year. Since 2015, the Capacity Development Program has also hosted intensive Asset Management workshops in C.
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 has hosted some Rate Setting workshops.
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, NTNCs, CWS	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.

Capacity Development – Upcoming Initiatives

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's 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 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.

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 other 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.

In 2020, the Capacity Development Program will seek proposals from contractors to create a digital Water Rates Dashboard. This interactive tool 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.

Capacity Development – Looking Forward

The Capacity Development Program's goal is to help ensure that Vermont's public water systems are sustainable. Sustainable drinking water systems 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.

Feeling pressure to keep user rates low, many communities have not been making the investments needed to properly maintain, repair, rehabilitate, and replace their drinking water infrastructure. Consequently, more pipes, pumps, storage tanks, and water treatment plants continue to exceed their engineer's assessment for remaining useful life. The EPA estimates that Vermont needs to invest more than $510 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, Fifth Report to Congress, April 2013). 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.

As drinking water infrastructure continues to age and degrade, public water systems will continue to struggle to be sustainable and remain in compliance with safe drinking water standards and regulations. Funding from utility reserves and public financing will likely not be enough to address Vermont's drinking water infrastructure needs into the future. This financial shortfall presents the greatest challenge for most public community water systems. Vermont's Capacity Development Program is encouraging systems to develop and implement Asset Management Programs to help address this funding shortfall, and to plan to meet these and other challenges they likely face (e.g., emerging contaminants, retaining the knowledge of retiring staff, adjusting to changes in demand for services, and complying with new and more stringent regulations).

"You cannot have a first-rate community…with third-rate infrastructure" *– Source unknown*

Building on momentum from the Asset Management Plan Development Workshops and Grants, the Capacity Development Program will continue to help systems by offering more training, technical assistance, and 100% forgivable Asset Management Planning Loans. In addition, the Capacity Development Program will update the Division Capacity Strategy to ensure it continues to drive the direction of the program and helps Vermont's Water Systems increase their technical, managerial, and financial capacities.

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 2019, the federal capitalization grant and state match that fund Vermont's Drinking Water State Revolving Loan Program was $11,004,000. 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.

Vermont Drinking Water and Groundwater Protection Division
Public Water Operator Certification Program

Annual Report for Calendar Year 2018

June 24, 2019

This 2018 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, 2018.

Appendix B of this document is extracted from the April 12, 2019 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 2018 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 2018.

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.

TABLE 1

Certification Class	1A	1B	2	3	4A1	4A	4B	4C	D	TOTAL
Fully Certified Operators	443	117	250	160	2	9	49	74	62	1166
Operators in Training	-	-	10	11	-	2	3	4	3	33
Grandfathered Operators	-	-	16	9	-	4	3	5	6	43

TABLE 2

Water System Class	Total Number of Water Systems Per Class	Number of Water Systems by Type
1A	543	All TNC
1B	126	All TNC
2	483	TNC – 1 NTNC – 208 CWS - 274
3	173	TNC – 50 NTNC – 31 CWS - 92
4A1	4	TNC – 3 CWS – 1
4A	13	TNC – 5 NTNC – 2 CWS - 6
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, 2018.

TABLE 3

System Type	Number of Systems	Number of Systems With No Certified Operator as of 12/31/18
Community	414	7
Non-Transient Non-Community	248	7
Transient Non-Community*	736	60

* 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:

(a) Submit a complete operator certification application form;
(b) Have a high school diploma or a general equivalency diploma (GED);
(c) Obtain the minimum years' operating experience required for the class certification applied for (see Table 4);
(d) 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;
(e) Pay the required fee (class 1A and 1B are $45 and all other classes are $80); and
(f) 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 2018, Vermont class 2, 3, 4 and D exams were administered in the spring and fall (May 4, 2018 and November 2, 2018) at two different locations (Berlin and Rutland, VT) on the same day. There were 40 individuals who took an exam in May and there were 62 individuals who took an exam in November. The results for 2018 are summarized in Table 5 below.

TABLE 5

Test Class	Class 2	Class 3	Class 4	Class D
Total Examinees	31	26	23	22

Number of passing grades	25	17	9	4
Percent Passing	81	65	39	18

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 (see below). 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 43 grand parented operators in our certification database (SWOCS).

The three individuals who received a grandparent certification in 2016 include:

Robert Brown became a grandfathered Class 3 Certified Operator in 2016 following the reclassification of the TNC water system he operated due to the use of granular activated carbon for hydrogen sulfide removal. Robert had stated that he has operated the existing treatment facility for approximately 20 years prior to the reclassification. Robert is still operating this water system, and we expect him to renew his certification by 6/30/2019.

Eric Leduc became a grandfathered Class 3 Certified Operator in 2016 following the reclassification of the TNC water system he operated due to the use of aeration and granular activated carbon for methane removal. Eric had stated that he has operated the existing treatment facility for approximately 11 years prior to the reclassification. Eric is still operating this water system, and we expect him to renew his certification by 6/30/2019.

Wayne Smith became a grandfathered Class 3 Certified Operator in 2016 following the reclassification of the TNC water system he operated due to the use of air injection and filtration for iron removal. Wayne had stated that he has operated the existing treatment facility for approximately 17 years prior to the reclassification. Wayne no longer owns or operates the water system therefore will not be renewing his certification by 6/30/2019.

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.

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 2018. Table 3 above summarizes the total number of water systems without a certified operator as of the end of 2018. The one Administrative Order issued in 2017 relating to not having a certified operator was resolved in 2018.

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	4	0
NTNC	8	2	2
TNC	75	0	-

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 2018 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, 2016 through June 31, 2019. Therefore, there were no operators renewing their Class 2, 3, 4, or D certification in 2018. 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. Forty-seven operators with a Class 1 certification renewed their certification in 2018.

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 43 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 2018 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 3 -72 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 118 different approved courses offered for credit towards Vermont operator certification in 2018.

The state continued to contract with VRWA for the duration of 2018 first with a second and final amended contract running from May 1, 2017 through April 30, 2018. The State issued a request for proposals in December 2017 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. 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 2018, approximately 5653 training contact hours were awarded to water professionals through classes provided throughout the state and through online training courses. Approximately 78% of these training contract hours were awarded by VRWA. Details of the training provided by Vermont Rural Water Association in 2018 are listed in Appendix A.

Review and approval of training courses occurred throughout the year except for VRWA, GMWEA, NEWWA, Earth Water Specialists, and NEIWPCC 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 Impliment 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. The Operator Certification Coordinator spent approximately 20 % 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 35% 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 2018 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 April 27 and November 9, 2018. 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. Some of the topics discussed by the committee include:

- 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 tasks that an operator must perform and tasks the operator can delegate.

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, 2018 – December 31, 2018

Month	Vermont Rural Water Association Training Sessions January 1, 2018 – December 31, 2018 Course Title	TCH	# of attendees	TCHs Awarded
Jan	Optimizing your Pump Station	3	16	48
	Chemical Feed Pumps	3	21	63
	Understanding your Motor Control Panels	5	18	90
	Sampling Seminar	4	27	108
Feb	Technology Changing the Water Industry	4	15	60
	Effective Asset Management	4	20	80
	Operation and Maintenance Manual	3	13	39
	Jar Testing - Burlington	3	15	45
	Traffic Control Certification	3	19	57
	Line Defrosting and Line Maintenance	3	23	69
	Jar Testing – Rutland	3	16	48
Mar	Advanced Operator Training (Class 3 and 4)	30	14	375
	Distribution Operator Training (Class D)	20	7	140
	Basic Math Water Operators	3	8	24
	Metering in the 21st Century - Rutland	3	16	48
	Metering in the 21st Century – Essex Jct.	3	13	39
Apr	Advanced Operator Training (Class 3 and 4)	15	14	210
	Distribution Operator Training (Class D)	10	6	60
	Small Systems – Putney	18	4	72
	TNC Operations Course	3	18	54
	Small Systems – Montpelier	18	4	72
	Basic Operator Math	3	13	39
May	Exam Preparation Course (Class 3, 4 and D)	4	5	20
	VRWA Annual Conference Trainings:			
	Ice Pigging Water Quality Improvements	1	62	62
	Recruiting for the Future	1.5	29	43.5
	Sampling Seminar	1.5	72	108
	Phosphorous Optimization	1	26	26
	Updated Boil Water Notice Policy	1	70	70
	Sustainable Utility Management	5	4	20
	TNC Operations	3	7	21
June	Revised Total Coliform Rule	3	4	12
	Vermont Environmental Consortium Conference	5	56	280
	Leak Detection	4	21	84
	TNC Operations	3	23	69
	Cyanobacteria	2	16	32
	School Operator Update	1	4	4
	Preparing for a Sanitary Survey	4	14	56
	Sustainable Utility Management	5	4	20
	Effective Utility Management	5	14	70
July	Basic Excel - Rutland	3	9	27
	Basic Excel – Essex Jct.	3	8	24
	TNC Operations	3	10	30

	Basic Excel - Lyndonville	3	13	39
	O&M Manual	3	6	18
August	VOSHA	6	14	84
	O&M Manual	3	5	15
	Basic Water System Math	3	5	15
September	Advanced Operator (Class 3 and 4)	30	10	300
	Distribution Operator (Class D)	30	3	85*
	Basic Excel	3	4	12
	Basic Math	3	7	21
	Troubleshooting Your Control System	3	25	75
October	Advanced Operator (Class 3 and 4)	15	10	150
	Sanitary Survey	3	19	57
	Small Systems - Rutland	18	7	126
	Small Systems - Lyndonville	18	8	144
	Leadership in Safety	3	21	63
	Exam Preparation – Small Systems	4	6	24
	Exam Preparation – Class 3, 4 and D	4	13	52
November	Leadership in Safety - Newport	3	20	60
	Leadership in Safety – Essex Jct.	3	14	42
	Flagger Training	3	9	27
December	Leadership in Safety	3	21	63
	Ethics for Operators	3	18	54
	Effective Utility Management	5	13	65
	VRWA 2018 Total:	395	1049	4424.5

*One operator missed one 5-TCH class

Appendix B

AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ENVIRONMENTAL PROTECTION RULES
CHAPTER 21
WATER SUPPLY RULE
REVISION DATE: April 12, 2019

Subchapter 21-12 WATER SYSTEM CLASSIFICATION AND OPERATOR CERTIFICATION

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 exchange; or
(i) Aeration

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.