TECHNICAL ADVISORY COMMITTEE

Established by Act 133 of the 2001 Adjourned Session

Annual Report to the Legislature

REGARDING OVERSIGHT AND IMPLEMENTATION OF THE
WASTEWATER SYSTEM AND POTABLE WATER SUPPLY RULES

Submitted To:
State of Vermont Legislature

Submitted By:
Roger Thompson (Clerk of the Committee) and
Bruce F. Douglas, PE (Committee Chair)

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Members of the Act 133 Technical Advisory Committee (contact information for each is in Appendix A:

Mark Bannon, P.E., Professional Engineer
Julia Beaudoin, Department of Environmental Conservation (DEC), Drinking Water and Groundwater Protection Division (DWGPD) Hydrogeologist
Chris Campany, Executive Director, Windham Regional Planning Commission
Ernie Christianson, Regional Office Manager, DWGPD (retired)
Scott Davis, Licensed Designer and Excavating Contractor
Tom DeBell, Environmental Health Engineer, Environmental Health, VT Health Dept.
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Brad Fischer, Service Provider
Jenneth Fleckenstein, Water Quality Specialist
Craig Heindel, CPG, Hydrogeologist
Seth Jensen, Deputy Director, Lamoille County Planning Commission
Craig Jewett, P.E., Professional Engineer
Sille Larsen, DEC, DWGPD, Water Resources and Engineering Program Manager
Gunner McCain, Licensed Designer
Stephen Revell, CPG, Licensed Designer, Hydrogeologist
David Swift, DEC, DWGPD, Technical Services Engineer
Roger Thompson, Licensed Designer
Ken White, Licensed Well Driller
Jeff Williams, Licensed Well Driller
Jared Willey, Service Provider
Sheri Young, Licensed Designer and Certified Professional Soil Scientist

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Purpose

The Technical Advisory Committee was created by Act 133 of the 2001 Adjourned Session of the Legislature and incorporated into the Vermont Statutes as Chapter 64, Section 1978(e)(2) which appears as:

The secretary shall seek advice from a technical advisory committee in carrying out the mandate of this subdivision. The governor shall appoint the members of the committee and ensure that there is at least one representative of the following entities on the committee: professional engineers, site technicians, well drillers, hydrogeologists, town officials with jurisdiction over potable water supplies and wastewater systems, water quality specialists, technical staff of the agency of natural resources, and technical staff of the department of health. Administrative support for the advisory committee shall be provided by the secretary of the agency of natural resources.

Section 1978(e)(3) required the preparation and submission to the legislature of an annual report on several topics: the implementation of this Chapter and the rules adopted under this Chapter; the number and type of alternative or innovative systems approved for general use, approved for use as a pilot project, and approved for experimental use; the functional status of alternative or innovative systems approved for use as a pilot project or approved for experimental use; the number of permit applications received during the preceding calendar year; and the number of permit applications denied in the preceding calendar year, together with a summary of the denial. This report is a summary of the work by the Technical Advisory Committee and the recommendations made by the Committee during 2024.

Technical Advisory Committee Members

Members of the Technical Advisory Committee (TAC) are recommended by the Secretary of the Agency of Natural Resources and appointed by the Governor. The full list of Technical Advisory Committee Members, and their contact information, is attached as Appendix A.

Meetings

Online meetings were held on February 26th, March 11th, April 15th, May 20th, June 17th, July 15th, September 16th, October 21st, November 18th and December 16th. The minutes from these meetings are attached as Appendix C.

Activities of the Technical Advisory Committee (TAC)

1. General Comments:

Technical Advisory Committee continued to meet virtually during 2025. The meetings were well attended. The TAC reviewed issues raised by the Department of Environmental Conservation (DEC) and TAC members. TAC members offered advice on various topics.

2. Wastewater System and Potable Water Supply Rules (WW Rules):

The TAC discussed the process for doing a rule update. The Secretary of State's Office has a process with a series of steps that are required to complete an update. An important step is outreach to the public and to those directly involved in applying the WW Rules to a particular project. This step is important both to collect information about the use of the current rules and to ensure that any revisions to the rules respond to existing problems. The process also identifies emerging technologies and trends that should be addressed. The TAC suggested contacting groups such as Licensed Designers, the League of Cities and Towns, excavating contractors, Licensed Well Drillers, and septage pumpers. Realtors and attorneys dealing with land transactions should also be consulted. The rule adoption process also includes consultation with other State Divisions and Agencies.

The DEC decided to postpone work on a general updating of the WW Rules until 2027 because of an extremely heavy workload, and efforts to improve the permitting process.

3. Municipal Water and Wastewater Connection Study Committee:

A study committee was created in response to section 25 of Act 47 of 2023 to examine the process for permitting projects that are connected to both municipal water and wastewater systems. The Committee developed a recommended plan that allows a municipality to take delegation of the authority for technical review of WW Permit

applications for projects using both municipal water and wastewater systems. The participating municipality would receive the applications, perform a technical review for compliance with the requirements of the WW Rules. Under the recommended plan, once a municipality has completed their technical review and approved the design of the wastewater and/or water connection, they would electronically submit documentation of their approval along with supporting application, plans and other pertinent documents to DEC. The DEC would then issue a general permit to the landowner and would manage the permit data, in an existing on-line database that covers all wastewater system and potable water supply permits state-wide. A Design Manual, discussed below, will be developed to support municipal officials and Licensed Designers in preparation and review of applications. The municipality would make the decision to take or not take the delegation of authority. Some larger municipalities already have technical staff that can do the required review and may wish to take delegation while municipalities without existing technical staff may not wish to add staff and, therefore, will not request delegation.

4. Municipal Water Supply and Wastewater Connections Design Manual:

The Legislature authorized $50,000 for the creation of a design manual, and the DEC has created a request for proposals (RFP) for this work that will be released in early 2026. The WW Rules specify requirements but also allow for alternative designs. The manual will include examples, with illustrations, of various designs that can be approved under the WW Rules. The manual will also provide clarification of capacity to serve and will outline a general permit process. The manual will be advisory, but will help municipal regulators, and Licensed Designers, understand the range of designs that meet the WW Rules.

5. Overshadowing:

When the required isolation distances around water sources and wastewater disposal systems extend onto neighboring properties it is often described as overshadowing. The extension of isolation distances onto neighboring properties has been part of the regulations related to subdivision of land, installation of water systems, and installation of wastewater systems since the regulations were first established. In many cases there is no adverse impact on the neighboring property but in some cases, it restricts the area where water sources and wastewater systems can be installed on the neighboring property. The State uses a first-in-time approach so that sources or systems that are already installed or are already permitted for installation take precedence over future installations. There are concerns about the restrictions that can

be imposed on neighboring properties, and the issue has been reviewed several times and the options for minimizing or eliminating the impact on neighboring property considered. The TAC discussed the issues in detail, and produced a report in 2010 which is available at:

https://dec.vermont.gov/sites/dec/files/dwgwp/rotac/pdf/2011.01.15.tacovershadowingrep.pdf

The report recommended retention of the first-in-time approach.

The Legislature, in Act 145 of the 2010(adjourned) session added a requirement to the WW Rules that whenever overshadowing occurred, the applicant must provide written notification to the affected property owner.

The TAC created a subcommittee in 2024 and continued discussions in 2025. The primary issue reviewed was the isolation distances required between water sources and wastewater disposal systems. Vermont has isolation distances that were developed based on time of travel of wastewater through naturally occurring soil and the amount of pathogens, particularly viral, reduction over time. These distances are larger than many other states. The TAC agreed that these isolation distances should be evaluated using any available research that has been done since the original adoption. These issues are discussed in more detail in the minutes of the February, March, and April meetings included in Appendix C.

6. Innovative/Alternative Technologies:

The use of Innovative/Alternative ("I/A") wastewater technologies continues to grow. Additional technologies were approved during 2025. The goal of many of the new approvals in recent years has been to reduce the cost of wastewater disposal systems. (The current list of approved systems is available at: https://dec.vermont.gov/drinking-water-and-groundwater-protection/wastewater-system-and-potable-water-supply-program-1-0)

- General Use I/A technologies are wastewater treatment systems or system components that the manufacturer can demonstrate that it satisfies specific technical standards in the WW Rules and has proven reliability and performance for its proposed use. I/A Dispersal technologies can be approved for general use as substitutes for traditional bed or trench leachfield dispersal system if they have proven reliability and performance for its proposed use
- Pilot Use I/A Treatment Technologies can be approved if there is documentation of third party or bench testing for up to twenty-five permits

per year, with a defined inspection and/or monitoring approach to document performance and reliability for possible future inclusion under a general approval

Experimental Use I/A Treatment Technologies are for up to five permits per year if there is documentation of third party or bench testing for up to twenty-five permits per year, with a defined inspection and/or monitoring approach to document performance and reliability for possible future inclusion under either experimental or general approval During 2025, the DEC approved one new I/A technology (Table 1).

Table 1: New Innovative/Alternative Technology Approved in 2025

Approval Type	Company	Technology	Technology Type	Expiration Date
General I/A Treatment & Dispersal	Oakson, Inc.	Perc-Rite Drip Dispersal with sand substrate	Drip discharge of filtrate into native soil	May 1, 2027

Ten I/A Approvals were renewed in 2025 (Table 2).

Table 2: Innovative/Alternative Technology Approvals Renewed in 2025

Approval Type	Company	Technology	Expiration Date
General I/A Treatment	Infiltrator Water Technologies, LLC	ECOPOD-N	May 1, 2027
General I/A Treatment	Premier Tech Environment	Ecoflo	May 1, 2027
General I/A Treatment	Hydro-Action Mfg., Inc.	Hydro-Action aerobic	May 1, 2027
General I/A Treatment	Jet, Inc.	Jet aerobic	May 1, 2027
General I/A Treatment	SeptiTech	SeptiTech recirculating trickling filter	May 1, 2027
General I/A Treatment	SludgeHammer Group, Ltd.	SludgeHammer ABG aerobic	May 1, 2027
General I/A Dispersal	Infiltrator Water Technologies, LLC	AES and ES gravelless distribution (Presby)	May 1, 2027
General I/A Dispersal	GeoMatrix, LLC	GeoMat flat leaching system	May 1, 2027
General I/A Combined Treatment and Dispersal	GeoMatrix, LLC	GeoMat flat leaching system with sand substrate	May 1, 2027
General I/A urine diversion	Rich Earth Institute	Rich Earth non-plumbed fixtures	May 1, 2027

7. Low Income Loan and Funding Programs:

During calendar year 2025, the On-Site Loan Program made five loan awards for a total of $173,025.00 in new loan commitments. Four of the five loans were for the replacement of failed wastewater systems; the other loan was for the replacement of a failed water supply. The On-Site Loan Program has partnered with the Opportunities Credit Union (renamed due to a merger as Green Mountain Credit Union) to underwrite and service the loans made under this program.

In July 2025, the Agency of Natural Resources' (ANR) Healthy Homes Initiative opened a fourth round of funding to low to moderate income households to repair or replace failed or inadequate on-site drinking water and wastewater systems. For this first round of state-funded awards (via the General Fund), the Program expects to fund around 100 projects. As of January 12, 2026, the first 25 awards have been issued. The remaining awards will be issued over the first few months of 2026. A total of 272 WW permits have been issued for ANR Healthy Homes funded projects since 2022 by the Wastewater and Potable Water Supply Systems Program, with most replacement water supplies being exempt from permitting. Of the 272 permits issued, 242 wastewater systems and/or potable water supplies have been successfully constructed to date. The ANR Healthy Homes Program has committed $18.7 million to wastewater and potable water supply projects in communities all throughout Vermont.

8. Technical Advisory Committee Plans for 2026:

The TAC decided to meet quarterly during 2026. The group decided to form several subcommittees that would work on a specific topic, at their own pace, and then bring the topic to a TAC meeting for discussion. A DEC staff member will be part of each group for support and coordination. The following topics have been suggested:

A. Wastewater Effluent Loading Rates (Application Rates) in a variety of soil types
B. High Strength Wastewater
C. Housing Issues
D. I/A Technologies
E. Mound Fill Specifications and Types (sand; other materials)
F. Well Siting and Construction
G. Potable Water System Design and Water Quality Testing

Appendix A - Technical Advisory Committee Members as of December 1, 2025

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Executive Committee:
Members: Steve Revell, Gunner McCain, Bruce Douglas
Alternates: Sheri Young, Craig Heindel

Appendix B - Regional Office Permitting and Training Information

Table B-1: Compliance with Performance Standards for Regional Office Permits Issued During Calendar Years from 2007-2025 (continued on following page)

Year	# of Permits Issued	# of Permits Meeting PEP Standards	% of Permits Meeting PEP Standards	Average DEC Days
2007	3746	3691	98.5%	16.8
2008	3435	3418	99.5%	12.3
2009	2691	2672	99.3%	11.8
2010	2621	2600	99.2%	11.9
2011	2289	2279	99.6%	13.2
2012	2472	2444	98.9%	12.7
2013	2449	2400	98.0%	14.0
2014	2503	2417	98.4%	12.6
2015	2367	2299	97.1%	11.8
2016	2647	2491	94.1%	16.2
2017	2253	2128	94.4%	16.7
2018	2527	2318	91.7%	15
2019*	2292	2110	84.0%	22.2
2020	2461	2344	95%	16.2
2021**	3085	2931	94%	22.6

2022	2961	2835	95%	29
2023* **	2788	2737	97%	14.9
2024	2981	2934	98%	17.7
2025	2825	2811	99.5%	11.5

Note: The performance standard for DEC days is 30 days for one-lot subdivisions and projects with a design flow of 560 gallons per day or less. The performance standard for other projects is 45 days.

* The Program had 2 technical people retire in two offices at the end of 2018 which affected the ability to meet PEP standards and increased the Average DEC Days, particularly for the first 6 months of 2019.

**The Program had 2 technical people retire and 1 technical person leave the Program in 2021. The vacancies, in conjunction with the increase in applications, affected the ability to meet PEP standards and increased the Average DEC Days.

***The Program onboarded 1 replacement technical person, plus 2 ARPA-funded limited-service technical review personnel in the beginning of 2023. The additional staff, once trained, significantly aided in the Program's ability to meet the PEP standards and decrease the Average DEC Days. Of the 3% not meeting PEP, most were permit applications from the first half of 2023, prior to the additional technical staff being fully onboarded and 90% were less than 3 days over the PEP standard. The additional technical staff have not only allowed for a decrease in the Average DEC Days and an increase in the percentage of applications meeting the PEP Standard, they have also alleviated a measure of stress and promoted a better work/life balance among the technical staff.

Table B-2: Failed Wastewater System Permit Information for 2007 to 2025 (continued on following page)

Year	Applications Submitted to Repair Failed Wastewater Systems	Percentage of Permits for the Repair of Failed Wastewater Systems	Number of Permitted Replacement Systems Installed To Date	Percentage of Permitted Replacement Systems Installed To Date	Percentage of Failed Wastewater Systems Past Due Date**
2007	330	8.8%			
2008	507	14.8%			
2009	503	18.7%			
2010	495	18.9%			
2011	471	20.6%			
2012	432	17.5%			
2013	435	17.8%			
2014	473	18.9%			
2015	446	18.9%			
2016	528	19.9%			
2017	490	21.8%	485	99.0%	1.0%
2018	497	19.7%	495	99.6%	0.4%
2019*	512	22.3%	508	99.2%	0.8%
2020	687	27.9%	682	99.3%	0.7%
2021**	643	20.8%	636	98.9%	1.1%
2022	552	18.6%	546	98.9%	1.1%

2023* **	614	22.0%	561	91.4%	8.3%
2024	602	20.6%	367	61.0%	3.7%
2025	477	17.6%	333	69.8%	4.6%

*Compliance for the WW Program actively reaches out to work with landowners to come into compliance with their permits to replace failed wastewater systems. Starting in 2024, the Program made two key changes to make it easier for landowners to comply with their permits. First, the Program automated electronic reminders to landowners that their permit due dates are approaching and that they may request an extension of the date with cause. Secondly, the Program changed its policy of requiring a permit amendment for extending construction dates that were past due to allowing the submission of an installation certification for a system that was installed past its permitted due date to resolve the compliance issue of record. The Compliance Team is actively utilizing Notices of Alleged Violation (NOAV) to inform landowners when they are past their due dates. The landowners are realizing a cost savings by no longer needing to hire a designer to submit a permit amendment application, nor pay the permit fee to the State, but continue to realize the importance of compliance through the NOAV process.

**Each permit for a failed system replacement includes a due date for construction, The due date may be extended if the permittee notifies the compliance program about the need and rationale for requesting an extension

Table B-3: Permit Information for 2025

Permits Issued to Repair Failed Wastewater Systems	Applications Denied *	Percent of Applications requiring 1 or more review comments to be addressed to meet the Rules	Number of Installation Certifications for wastewater and potable water supplies received in 2025	Total Number of Permit Compliance Document Submissions received in 2025
489	41	62	2065	3587

* Denials are issued for applications that are incomplete or fail to demonstrate compliance with the Wastewater System and Potable Water Supply Rules when submitted. Almost all denials are the result of a lack response to application review comments, so the specific technical reasons for denials are not readily retrievable.

Table B-4: Permits Granted for Innovative/Alternative (I/A) Wastewater Technologies Summary, 2007 to 2025

Year	Overall Number of I/A Systems Permitted
2007	137
2008	796
2009	538
2010	457
2011	424
2012	513
2013	521
2014	612
2015	594
2016	526
2017	545
2018	561
2019*	536
2020	735
2021**	841
2022	1,032
2023***	817
2024	738
2025	716
Total	11,639

Table B-5 Innovative/Alternative (I/A) System Inspection Reports Received

(Installed I/A technologies require an inspection and report be submitted to VTDEC each year, as listed in the following table.)

Year	Innovative/Alternative Inspection Reports Received
2012	52
2013	693
2014	891
2015	914
2016	960
2017	1040
2018	1037
2019	1013
2020	1351
2021	1404
2022	1190*1664**
2023	1845
2024	2413
2025	2331

*Multiple IA Service Providers have had health issues in the later part of 2022. The Program is allowing them to continue to upload their tardy reports for the first two weeks of January. The expectation is once complete the compliance reporting will exceed 2021's number.

**The final number of I/A reports received for 2022 inspections.

Table B-6: Innovative/Alternative Technologies Permits Issued in 2025, Listed by Manufacturer (continued on following page)

I/AI/A Manufacturer	Number of General Use I/A Products Permitted	Number of General Use I/A Dispersal Technologies	Number of Pilot Use I/A Treatment Technologies Permitted	Number of General Use I/A Products Permitted
Advanced OnSite Solutions	4			
Advanced Enviro-Septic and Enviro-Septic		329		
Algaewheel				
Anua				
Aqua Test				
Aquapoint				
Bio-Microbics	14			
Chittenden Solid Waste District				
Delta Environmental Products				
Ecological Tanks				
Eljen Corp	11			
GeoMatrix, LLC		17		

Hydro-Action Manufacturing, Inc.	5			
Infiltrator Water Technologies, LLC		74		
Jet	77			
Norweco	24			
Oakson	1	4		
Orenco	65			
Premier Tech Environmental	69			
Rich Earth Institute	14		3	
SeptiTech	5			
SludgeHammer Group Ltd.				
Total	**289**	**424**	**3**	

Table B-7: Licensed Designer Program Education Opportunities*

Year	DEC Sponsored Training		DEC Endorsed Soil Classes	DEC Endorsed Non-Soil Classes
	Classes	Attendees		
2010	5	120		
2011	4	110		
2012	7	215*		
2013	12	273*		
2014	12	173*		
2015	13	222		
2016	5	200*	20	36
2017	4	159*	16	20
2018	5	110	12	17
2019	12	186	12	17
2020**	2	33	6	34
2021	8	200*	11	39
2022	11	250*	11	33
2023	6	105*	12	78
2024***	10	180*	10	45
2025****	NA	NA	NA	NA

* Estimated

** Due to Covid-19 many classes were cancelled. In response, additional online classes which could be taken at any time were added to the DEC Endorsed Class offerings and are only counted once on this chart.

*** Due to Covid-19 many classes were cancelled. In response, additional online classes which could be taken at any time were added to the DEC Endorsed Class offerings and are only counted once on this chart. The Office of Professional Regulation's Emergency Provision, that allowed for additional asynchronous, virtual continuing education credits officially sunset on December 31, 2023.

****NA = Data not available in time for this report.

Table B-8: Number of Licensed Wastewater System and Potable Water Supply Designers by Classification as of December 31, 2025

Licensed Designer Classification*	Number of Licensees
Class A	34
Class B	42
Class BW	54
Class 1 (PEs)	196
Total	326
Total Active Designers**	212

* There are four classes of licensed designers that are licensed by the Office of Professional Registration under the Vermont Secretary of State. These four classes are generally summarized below:

- **Class A** designers are able to evaluate sites, design and certify installation of up to 1350 gallons per day (gpd) design flow soil-based wastewater systems with gravity distribution, and inground leachfields. They may also design potable water supply serving one single family residence with a fire suppression system of no more than two sprinkler heads.
- **Class B** designers can design what Class A designers can do, plus evaluate sites, design and certify installation of up to 1350 gpd design flow wastewater, plus pressure distribution, drip dispersal, mound systems and innovative alternative wastewater technologies and sewer connections of less than 400 feet in length without a manhole up to 1350 gpd design flows
- **Class BW** designers can design what Class B designers can do, and are similarly limited to up to 1350 gpd design flows, plus potable water supplies that include the following: a water treatment system, a surface water source, or a water supply line that includes a fire hydrant or fire suppression system
- **Class 1** designers are Registered Professional Engineers n can evaluate sites, design, and certify installation of all aspects of municipal water and wastewater connections, potable water supplies and, with soil certification, all aspects of soil-based wastewater systems.

** Total Active Designers is the number of Licensed Designers who submitted one or more permit applications in 2025.

Appendix C - Approved TAC Meeting Minutes, 2025

Approved Minutes of the Technical Advisory Committee Meeting

February 25, 2025

Participation by videoconference

Attendees:	Eric Deratzian	Bruce Douglas*
	Steve Revell*	Sheri Young*
	Jeffrey Williams	Craig Jewett*
	Roger Thompson*	Ernie Christianson*
	Craig Heindel*	Julia Beaudoin*
	Terry Shearer	Kevin Eaton
	Tom DeBell*	Denise Johnson-Terk
	Gunner McCain*	Jared Willey*
	Ken White*	Mark Bannon*

*Technical Advisory Committee members or substitutes

Scheduled Meetings:

All meetings are scheduled as virtual meetings.

March 11, 2025	2-4 PM
April 15, 2025	2-4 PM
May 20, 2025	2-4 PM
June 17, 2025	2-4 PM
July 15, 2025	2-4 PM
September 16, 2025	2-4 PM
October 21, 2025	2-4 PM
November 18, 2025	2-4 PM
December 16, 2025	2-4 PM

Agenda:

The proposed agenda was accepted as drafted.

Minutes:

The draft minutes of the last meeting, on December 17, 2024, were reviewed and approved online. The meeting scheduled for January 21, 2025 was cancelled.

Innovative/Alternative Technologies:

Bruce reported that the Perc-Rite® Drip Dispersal System has been approved for use as a filtrate treatment and dispersal system. The approval for use as a filtrate system requires that additional ASTM-33 sand be placed under the drip dispersal lines. The application rate remains the same as for non-filtrate dispersal systems. The resulting system is similar to the GeoMat™ Flat Leaching System with 6" of specified sand and the EcoFlo® Linear Biofilter Pressurized System with 6" of specified sand. A lysimeter pan must be installed under the piping in any of these systems to allow for collection of samples that can be analyzed for compliance with the permits if a problem is identified. Routine testing is not required.

Bruce noted that review of the Sludge Hammer™ is continuing. This is an aeration system that is installed in the septic tank.

Systems Freezing:

Sheri asked Jared if he had seen any freezing problems. Jared said there have been few frozen systems, but they all appeared to be caused by non-compliant installations.

Legislative Update:

Bruce reported that there is movement on the process to allow a municipality to take delegation for issuing permits for projects connected to both municipally owned water and wastewater systems. The municipality would perform technical reviews and issue the approvals while sending information to the Department of Environmental Conservation for inclusion in the State database and posting online. The ability to take delegation for projects without both municipal water and wastewater systems will be discontinued. Jared noted that several small communities will meet the requirements for delegation in the future. While the large municipalities already employ staff that does technical reviews, smaller municipalities may not, and may decide not to take delegation. Sheri asked about the impact on Regional Office workload. Bruce estimates only about 50-100 projects per year will be subject to the delegation process out of about 3,000 permits per year so the effect will be small. Bruce also mentioned that the additional staff that was recently added under the American Rescue Plan Act (ARPA) are temporary and will be available for only two more years.

A bill has been introduced to the Vermont Legislature that would ban land application of biosolids and septic waste over concerns that long lasting contaminants, such as polyfluoroalkyl substances (PFAS) are included in the waste. There are concerns about the impact on municipal wastewater treatment facilities due to the concentrated nature of the waste.

Overshadowing Subcommittee:

Bruce reported on the work of the Overshadowing Subcommittee. Overshadowing occurs when an isolation distance around a water source or a wastewater disposal system extends onto a

neighboring property. In some cases, the overshadowing limits installation of water or wastewater systems on the neighboring property. The Department of Environmental Conservation is reviewing the existing requirements to determine if any changes should be made to reduce the impact on neighboring property owners. Bruce, Steve, and Mark attended the initial meeting. Tom will join the group.

A report that was prepared by the Technical Advisory Committee and issued on January 15, 2010 is the starting point and will be reviewed for possible updates. The report is available online at:

https://dec.vermont.gov/sites/dec/dwgwp/rotac/pdf/pdf/2011.01.15.tacovershadowingrep.pdf

The isolation distance around a water source has the most impact on neighboring development and the TAC discussed ways in which the isolation distance can be reduced. The WW Rule allow for a reduction in isolation distance when it can be demonstrated that it will take two years or more for effluent from a wastewater disposal system to reach a water source. While there are situations where a groundwater flow analysis demonstrates that the groundwater flow is away from the water source, the more common basis for a reduction is that the soil is so slowly permeable that it would take at least two years to reach the water source.

Drilled Wells:

The issue of how far into bedrock must a drilled well be constructed was discussed. The 2019 WW Rules require that all bedrock wells have at least 20' of casing with at least 10' of the casing in competent bedrock. The requirement for 10' of casing in bedrock is to decrease the chance of groundwater just following down the well casing and potentially contaminating the water coming from the bedrock.

There was also discussion about how to deal with a situation where a permit has been issued that requires a well drilled into bedrock but during the well drilling process it is determined that there is sufficient water available above the bedrock. The horizontal isolation distances between wells drilled into unconsolidated material and wastewater disposal systems are greater than for bedrock. A revision to the approval can be based on the fact that the larger isolation distance for a non-bedrock well can be met, or the site conditions support a reduction down to the requirements for a bedrock well. The WW Rules state that an impeding layer of soil, as defined in the WW Rules can be the basis for the reduction. The difficulty is in determining that the required thickness and horizontal extent of the impeding layer exists. See §1-912(e)(3)(A). The group will discuss situations where the unconfined layer of soil is deep, a 100' or more, and determine if in addition to soil type, a thick vertical layer is protective. The issue was discussed extensively in 2012 and 2013. Excerpts from the TAC minutes and 2013 Annual Report are attached.

The TAC also discussed situations with an existing drilled well that does not meet the requirement of at least 10' of casing into competent bedrock. Jeff said that casing extensions can be done by placing a 5" pipe inside of the existing pipe and then sealing the two together. The

use of down well cameras was discussed with reports of good visual clarity that can determine if there is any leakage around the casing. Craig J. asked about pumping at a high rate that would accommodate an increased used and then doing water quality testing. Bruce noted that there might be contamination associated with an increase in wastewater disposal.

Bruce said the several fact sheets are about to be posted on the DEC website. Craig H. asked that these be copied to all TAC members.

The next TAC meeting will be March 11, 2025.

2-28-2025 Notes related to well isolation reductions based on soil type.

July 2012 TAC Minutes
Hydrogeology Subcommittee re: Proposed Simplified Procedure to Reduce Minimum Separation Zone between Drilled Wells and Leachfields

Craig gave an overview of the draft procedure (dated 6-12-2012). He noted that this procedure is intended to be a "simplified method" as opposed to a full hydrogeologic study of the site, and one that can be used by non-hydrogeologists on systems with a design flow of 1,350 GPD or less. Ernie noted that he would prefer the upper threshold to be 1,440 GPD so it matches a certain class of water system in the existing Water Supply Rules. Craig also explained that this draft procedure includes a standardized method of identifying whether a "continuous impeding layer" exists, as referenced in the Water Supply Rule [App. A, Section 11.4.2.0.2(a)]. There is an existing procedure in the Water Supply Rules that can be used to justify a reduction in separation distances [App. A, Section 11.4.2.0.2]. The two-year time-of-travel concept that is incorporated into the existing rules was used by the Subcommittee as the basis for this draft procedure [App. A, Section 11.4.2.1]. To put this procedure in context, Mark and Craig noted that the existing Wastewater System and Potable Water Supply Rules allow leachfields where there is only a thin layer of permeable soil, as little as 4', below the bottom of the leachfield, over bedrock. In this currently allowed scenario, the vertical travel-time downward through the high-permeability overburden will be much less than 2 years – generally a few minutes, hours, or days. The Subcommittee suggests that it might be a good idea to reconsider this issue in the future. Craig noted that this draft procedure primarily focuses on vertical travel-time downward from the vicinity of the leachfield, down to the top of the aquifer proposed to be tapped by a drilled well (regardless of whether that aquifer is a sand-and-gravel aquifer ("unconsolidated") or a bedrock aquifer.

Mark reviewed the details of the draft procedure. Subcommittee member Steve Revell, saying, noted that there could be a lot of questions from the full TAC as the Subcommittee found there

were several issues that were hard to decide. The procedure could be applied to existing wells when considering installation of a wastewater system but only if the well construction complies with the draft procedure. Most drilled wells for single family residences are not grouted as specified in the draft procedure.

Ernie asked about the requirement to grout the well to a depth of at least 50' and wondered if this might result in more grouting than necessary. Ernie gave an example of a gravel well that is 20' deep. The soil profile is 4' of sand, 8' of clay, and 8' of gravel with a water table at 12'. In this case the well only need be grouted to a depth of 12'. As drafted, the procedure would require a well that extends through the same soil profile into bedrock at 20' to be grouted to a depth of at least 50'.

Roger asked if there is consensus that 8' of low-permeability material is sufficient for the protection of the underlying aquifer.

Craig explained the Subcommittee's calculations to arrive at this 8-foot minimum thickness of low- permeability materials. The Subcommittee started with a Darcy equation for groundwater velocity:

$$V = \frac{(k)(i)}{n}$$

where k is saturated hydraulic conductivity, i is the hydraulic gradient (in this case the vertical hydraulic gradient, and n is the porosity of the low-permeability material.

The Subcommittee applied this equation to vertical saturated flow downward through an impeding layer of low-permeability material, using an estimated K-sat. value of 0.01 ft/day for soil textures described in the draft procedure (generally clays, silts, and silt or clay loams). This is a typical value for clays and silts such as glacial lake or marine bottom sediments, and for tills, used by DEC in other evaluations related to two-year time-of-travel calculations, and by the WSD in source protection area calculations. The hydraulic gradient was assumed to be 0.40, and the porosity was assumed to be 36% (a reasonable value for low-permeability materials, which can range from 30% to 40% or higher. In the past, very conservative analysis of vertical time-travel downward through impeding materials have typically used a hydraulic gradient of 1.0 (the maximum likely gradient). Craig and Steve indicated that in their experience, field testing on sites with slow-permeability overburden materials typically had hydraulic gradients in the range of 0.1 to 0.4.

The calculation of vertical saturated groundwater velocity then appears as:

$$V = \frac{(0.01)(0.40)}{0.36} \quad \text{therefore} \quad V = 0.0111 \text{ft/day}$$

At that velocity, to achieve at least two years of travel time (730 days), 8.1 ft. thickness of low-permeability material is needed.

Claude asked about situations where there is an unconfined aquifer overlying a confined aquifer and the proposal is to complete the well in the underlying confined aquifer. Craig suggested that these situations could support a reduction in isolation distance, and the existing rules allow for a reduction, but the analysis should require a site-specific hydrogeologic evaluation that is not included in the simplified approach in the draft procedure unless the impeding layer between the two aquifers, and the well design, meet the requirements in the draft procedure.

Ernie asked about the grouting of the annular space around the well casing and if grouting can be done when the well is drilled using the concentric method. Craig said this was discussed in the Subcommittee: when the well is drilled through a clay layer, the expectation is that the clay will be saturated for most or all of its thickness, and therefore it will be plastic enough that it will quickly settle tightly against the well casing. However, to provide multiple barriers the Subcommittee included the grouting requirement in all situations. So, in all situations, including drilling through a clay impeding layer, to meet the criteria in the draft procedure the casing must be sealed by grout. In the concentric drilling method, this can be accomplished with minor cost and time by sprinkling bentonite around the outside of the casing as the casing is advanced into the well bore.

Peter asked about the vertical travel rate under leachfields constructed in sand. Craig replied that travel time in 4’ of sand or gravel required above bedrock in the current rules would be minutes or hours at the most. Peter also asked about the fate of nitrates discharged from a leachfield. The nitrates are only slowly converted to nitrogen during passage through the soil.

Peter asked if till soils would be classified as low-permeability under the draft procedure (and therefore meet the phrase “impeding layer” in the current WSR). Craig said they would and that was the intent of the Subcommittee, though Ernie and Roger said that some ablation tills might be a concern. This needs to be evaluated and clarified.

Mark suggested that the procedure could be used to reduce the overshadowing issues because a neighbor would be able to install a well closer to a proposed leachfield. This would have an impact on the neighbor, as they would have to agree to grout their well. However it might be a reasonable approach if it allowed both landowners to develop their property.

Ernie said he is concerned about stating that three test pits are sufficient to evaluate the site. The Subcommittee said that three is the minimum number and agreed to look at the issue some more. The best approach will be to discuss the proposal with the regional office staff in advance and agree on the number of test pits needed, just as with a seasonal groundwater monitoring program where the number of monitoring wells can be agreed upon in advance, because each case will be site specific.

Roger asked again if there is consensus about relying on 8' of slowly permeable soil. Ernie said he wanted to review the issue with his staff before committing to the concept. Steve Rebillard said that based on his work in Alaska he would be very comfortable with relying on 8' of low-permeability materials ("impeding layer" per WSR). Scott asked how long it would take to get feedback from the Regional Office staff and Ernie said a couple of weeks or less.

November 2012 TAC Minutes
Process for Reduction in Well Isolation Distances:

Steve said that there was no decision to report from the subcommittee looking into this issue. Ernie said that there was a meeting at Mark's office where the problematic issue of the type, number, and location of test pits needed to support a reduction in isolation distance was discussed. Steve noted the issue of confined space restrictions for deep test pits which Ernie thought had been resolved by using an approach where the hole is entered and evaluated when the hole was only 4' or 5' deep. After the detailed soil evaluation at that depth, the hole would be dug to the full required depth and the soil evaluation would be made by looking at the material removed from the hole. Ernie suggested that the subcommittee meet to work on this issue. Mary will arrange for a time and location.

December 2012 TAC Minutes
The subcommittee working on the separation of wells from leachfields has met a few times. They developed a proposal for a prescriptive site evaluation that might be used to support a reduction in horizontal isolation distance. The sticking point has been how many test pits are required and where they need to be located in order to verify the nature of the soil between the well and the leachfield. Ernie wants the subcommittee to meet and work out these details. Ernie would like to see this included as an appendix in the next set of rules.

October 2013 TAC Minutes
The reduction of isolation distances between water and wastewater systems was also discussed. The draft rules propose to allow for a reduction when there is a continuous impeding soil layer, at least 8' thick, that separates the zone where wastewater is discharged from the aquifer where water is withdrawn. Jeff said that in some cases this layer exists but it is 100' below grade. There was discussion about how it could be determined that this layer is continuous and protective of the drinking water. Jeff said that there is well information and well driller knowledge that can be used to make this decision. Ernie expressed some concern about this approach except for cases where there are a lot of wells with uniform results, such as might be found in some Addison County clay soil areas. Mark asked if soil texture can be determined with ordinary well drilling techniques. Jeff said that a well driller can collect a sample of the well discharge and make this determination. Other members are not convinced of this because the materials could be sorted into finer and coarser material while being flushed from the well. 3 Anne asked if grouting by itself, without any impeding layer, justifies a reduction in isolation distance. Rodney and Roger

said no. There are situations where artesian conditions exist within the bedrock where grouting might justify a reduction in isolation distance.

November 2013 TAC Minutes
The existing rules require that the impact of a new well on an existing well be determined when within a specified distance. This is usually done by pumping from one well while monitoring the water level in an adjacent well. Ernie said that the distances seemed quite large and wondered why these distances were chosen. Scott said that they were determined based on a large amount of pump testing data that has been accumulated for public wells. Craig and Steve said that their work supported using the 200' distance that is in the current rules for wells that must supply 1.9 GPM or less.
The TAC also discussed the proposal to allow for a reduction in isolation distances when it is determined that the source aquifer is protected by a soil layer with lower permeability (confining layer). One method of making this determination is to compare the elevation of the water level in the well under pumping conditions to the elevation of the bottom of the confining layer. If the water level is above the bottom of the confining layer, the well is considered to be under artesian pressure which reduces the chance that contamination can move down into the source aquifer. The TAC supports the concept of reducing the isolation distance when the water level in the well under pumping conditions is at least 8' above the bottom of the confining layer.

2013 Annual Report

The TAC continued the discussion from last year of when it might be acceptable to reduce the prescriptive isolation distances between wells and sources of contamination, particularly between wells and leachfields. It was decided that when there is a soil layer with slow vertical permeability, with a thickness of at least 8' that extends over the full distance between the well and the leachfield, the isolation distance may be reduced to a minimum of 75' for a new source. In addition to situations where the existence of the slowly permeable soil layer can be determined by digging test pits, the TAC also supports this isolation reduction when a well is drilled through a slowly permeable soil layer that is at least 8' thick and the water level in the well under pumping conditions is at least 8' above the boundary between the source aquifer and the bottom of the slowly permeable soil layer. The TAC recommended that the wells for each situation be grouted.

Approved Minutes of the Technical Advisory Committee Meeting

March 11, 2025

Participation by videoconference

Attendees:	Bruce Douglas*	Denise Johnson-Terk
	Ernie Christianson*	Sheri Young*
	Gunner McCain*	Brad Fischer
	Craig Heindel*	Roger Thompson*
	Terry Shearer	Tom DeBell*
	Kevin Eaton	Craig Jewett*
	Julia Beaudoin*	Ken White*
	Jared Willey*	Frederic Larsen

*Technical Advisory Committee members or substitutes

Scheduled Meetings:

All meetings are scheduled as virtual meetings.

April 15, 2025	2-4 PM
May 20, 2025	2-4 PM
June 17, 2025	2-4 PM
July 15, 2025	2-4 PM
September 16, 2025	2-4 PM
October 21, 2025	2-4 PM
November 18, 2025	2-4 PM
December 16, 2025	2-4 PM

Agenda:

The proposed agenda was accepted as drafted.

Minutes:

The draft minutes of the previous meeting, on February 25, 2025 were not reviewed. They will be considered at the April 15, 2025 meeting.

Innovative/Alternative Technologies:

Bruce said there were no updates on the review or approval of I/A technology applications.

Jared reviewed the **Perc-Rite® Drip Dispersal VT Webinar** that was offered on March 11, 2025. There were about 30 participants and the feedback was positive. The recent approval for use of the Perc-Rite® Drip Dispersal System as a filtrate disposal system allows for a smaller system in the vertical dimension and increases the number of filtrate disposal systems that operate without a separate treatment tank.

Minimum Depth of Well Casing into Bedrock:

The current Wastewater and Potable Water Supply Rules (WW Rules), per section §1-1206, require that a well drilled into bedrock use at least 20' of casing and that at least 10' of casing is set into competent bedrock. This requirement applies when the designer proposes to use the isolation distances in Table 11-1 for a source in bedrock. Bruce noted that section §1-1206 allows for alternative standards and that there may be a different approved standard for the completion in bedrock that a designer could rely upon. The same standard in Table 11-1 can also be applied when the well is completed in a confined surficial aquifer, which is defined in the WW Rules. When the well is protected by a confining layer, there is no requirement to extend the well casing into bedrock, however this is sometimes done because it results in less sediment being drawn into the well. In this situation there is no requirement that the casing extend the full 10' into bedrock.

Also discussed was how to deal with the situation when an existing well is completed in bedrock, without meeting the 10' into competent bedrock standard, and is proposed for an increase in use. In some cases, a down well camera system can determine if there is leakage around the base of the casing. While water quality testing is always important, testing only gives a point in time answer, and by itself would not demonstrate that the water source is protected if there is a future increase in demand. An additional option is performing a hydrogeologic analysis that determines there is at least a two-year time of travel between any wastewater system and the well.

Overshadowing:

The overshadowing subcommittee: Ken White, Tom DeBell, Steve Revell, Mark Bannon, and Bruce Douglas, reviewed the 2011 report prepared by the Technical Advisory Committee (TAC). The report did not support a reduction of well isolation distances for new projects or increased demand based solely on using more than 10' of casing into bedrock or grouting around the well-casing, though these methods might apply when dealing with failed systems if full compliance is not possible. The report did not support a decrease in isolation distances for new projects or increased demand based on water treatment systems, though they might be used to remedy failed systems. The report also did not support a reduction of the isolation distances based on treatment of the wastewater. Bruce noted that most wastewater treatment systems were effective on larger

pathogens such as bacteria but less so for viruses and requires continuous maintenance. The report recommended retaining the existing isolation distances between water sources and wastewater disposal systems.

The subcommittee recommends reconsideration of the isolation distances between water sources and wastewater disposal systems. The current isolation distances in Vermont were developed based on work done in Vermont and other states where wells in the vicinity of wastewater disposal systems were tested for bacteria and nitrate concentrations. Nitrate is present in wastewater and is persistent in the wastewater as it flows through the soil away from the disposal system. Field work in Vermont evaluating the impact of onsite septic systems on groundwater quality confirmed the need to protect potable water supplies beyond the traditional 100-foot radius circle. Based on research in Colorado and New Jersey, wells that were at least 200-feet from soil-based wastewater treatment systems had lower probability of bacterial contamination than did wells within the 200-feet radius. Bruce noted that the survival time of viruses in groundwater is documented in research studies. Based on this information and the groundwater temperatures in Vermont, it was determined by both the Vermont Department of Health (VDH) and the DEC that a minimum two-year time of travel through the groundwater protects the water source. Other states have smaller isolation distances. The subcommittee recommended that they should be contacted to learn if they have done scientific evaluations to support the distances they have chosen. Testing water for viral contamination is difficult due to the wide range of pathogenic viruses in wastewater. Therefore, a limited amount of testing has been done, so there may not be much data available.

One method of evaluating the sources of water systems, when there are concerns about viral contamination, is to determine the amount of reduction in viral concentration needed to minimize the risk from consumption. The viral concentrations are usually expressed in logarithmic (log) form (one log is equivalent to a ten-fold reduction: virus concentrations in feces from infected individuals can range from one million (10^6) Plaque Forming Units (PFU)/gram to over 10 billion (10^{11}) PFU/gram. The determination that the water is safe to consume is based on the reduction of viral contamination by a specified number of logs. In the past, the DEC has presented recommendations based on documented research and groundwater quality findings to the VDH to request the VDH's review of the recommended approach to request VDH's review of the recommended isolation distances.

Viral reduction may occur over time, hence the two-year time of travel approach, by adsorption and absorption on soil particles as the water moves through the soil, or by use of water treatment systems. The use of water treatment systems was considered by the TAC. Reliable treatment of viruses usually requires disinfection by chlorine, which requires careful and continuous management that is difficult for single family or other small water systems. Based on these concerns, the TAC recommended against the use of water treatment systems for single family or other small water systems.

Craig J. said that there is not much viral testing done related to the design of public water systems. Approval is based on using treatment technology that will produce a 4-log reduction in viral contamination in surface water.

Sille noted that there are other contaminants of concern which would require other treatment methods.
Ken asked if the volume of water used is related to the two-year time of travel question. Ken said that because each of the water treatment systems he installs includes a water meter he can look at average daily used based on 90-day totals. These seldom exceed 300 GPD. Bruce said that a smaller flow results in a smaller area from which the water is drawn, while the uphill-downhill relationship between the water source and the wastewater disposal system is also important. Bruce also noted that the protection must be adequate for the larger users. Ken asked if the size of the wastewater disposal system matters. It does matter with larger wastewater disposal systems requiring larger isolation zones. Large water systems also require larger isolation distances.

The subcommittee also asked if the following questions should be added to the application form for a permit under the WW Rules:

1. Did you consider ways to reduce or eliminate overshadowing?
2. What was done to reduce or eliminate overshadowing?
3. Can the well driller reasonably access the proposed well site?
4. Will temporary roads be required during the construction process?

Questions 1, 2, and 4 would not affect the approval or denial of the application. If the answer to number 3 were to be no, redesign would be required.

Craig J. asked if these would be required questions? Roger, Craig H., Craig J., and Gunner agreed that this might result in many lawsuits if the answer to number 1 was no or if someone wanted to argue that the effort was insufficient. Gunner added that the Regional Engineers should not be put in a position of deciding if enough effort to reduce overshadowing had been made. The TAC does not support adding these questions and that it would be good to have Craig H, Craig J., and Gunner available to testify at the Legislature to explain how any changes that are proposed would work in the field. Ernie noted that changes to keep the isolation distances on the lot might result in fewer and larger lots.

Other Thoughts Related to Overshadowing:

One suggestion is to eliminate the requirement to send a notice to the neighbors. The impacts from overshadowing have existed since wastewater systems were first regulated more than 50 years ago. The requirement to send a notice to the neighbors was added in 2010 and resulted in many questions. In some cases, the neighboring property owner was frustrated to learn that while they might negotiate with the permittee there is no requirement to reduce or eliminate the overshadowing. This issue was discussed in the 2011 Report on Overshadowing. Some positive

effects and negative effects were reviewed without any determination if the requirement results in better projects or in increased costs without much benefit.

Ernie suggested that there be Legislative confirmation that permits should be issued based on the first-in-time approach which has been used since the beginning of wastewater disposal system regulation.

Also discussed was if the isolation distance shown on the plans, and the basis of the overshadowing notice, should be the minimum possible size. The group decided that gathering the information needed to make this decision would be very expensive with little benefit. It was noted that if a neighbor wished to develop their property, possibly using a location within the overshadowing area, they could collect site specific data that might show compliance with the WW Rules even though the location is included in the overshadowed area shown on the neighbor's plans. This is information they would need to collect even if the development on the neighboring property was pre-existing and unpermitted.

Access for well drillers to the permitted location was discussed. Ken said that most well drillers try to get to the designated location but well drilling rigs are very heavy, large, and mostly not all-wheel drive. They also need clear space above the drilling platform so they can only be so close to large trees. Sheri asked if the proposed training session for Licensed Designers proposed by the well drillers is still in the works. Ken said it is.

Old Business/New Business:

Bruce asked if anyone had old or new business they wished to discuss. There were no takers.

Next TAC Meeting:

Bruce confirmed that the next TAC meeting will be April 15,2025.

Other Issues:

Craig H. said that Watershed Management has created a general permit, that is now available for use, when it is necessary to directly discharge water from well drilling operations into surface water. The general permit can apply to new sources and to maintenance of existing sources. The general permit can be issued when the need for a discharge to surface water meets certain conditions. Craig H. noted that there is a 14-day notice period so the potential need for a permit needs to be considered before scheduling the well drilling. The approval may include the well drilling process water as well as the capacity testing water. Ken said that New Hampshire has a de minimis exemption set at 20,000 gallons. Water quality testing is not required for discharge of natural water. Ernie asked if there is an exemption for emergency wells and Craig H. said no. Julia said that the permit is

required only for flows directly piped to the stream, not discharges onto the ground surface that eventually make it to the surface water. Craig H. said that this most commonly occurs when the sump dug to contain the well drilling process water overflows when encountering a large flow of water. Julia said that the general permit was created because there are cases where large amounts of water, as much as 6 million gallons from one project in Killington, must be discharged. Julia said that she had contacted New Hampshire regulators and learned that New Hampshire did not have primacy status for surface water discharges. Craig J. asked if the general permit would apply for situations where well pumping is done to determine ground water flow. Julia will check.

Approved Minutes of the Technical Advisory Committee Meeting

April 15, 2025

Participation by videoconference

Attendees:	Denise Johnson-Terk	Chris Tomberg
	Bruce Douglas*	Jeffrey Williams
	Jen Fleckenstein*	Gunner McCain*
	Ernie Christianson*	Steve Revell*
	Craig Heindel*	Roger Thompson*
	Kassandra Diederich	Kevin Eaton
	Terry Shearer	Jared Willey*
	Sille Larsen*	Tom DeBell*
	Craig Jewett*	Frederic Larsen
	Megan Kane	

*Technical Advisory Committee members or substitutes

Scheduled Meetings:

All meetings are scheduled as virtual meetings.

May 20, 2025	2-4 PM
June 17, 2025	2-4 PM
July 15, 2025	2-4 PM
September 16, 2025	2-4 PM
October 21, 2025	2-4 PM
November 18, 2025	2-4 PM
December 16, 2025	2-4 PM

Agenda:

The proposed agenda was accepted as drafted.

New Attorney:

Bruce introduced Kacie Diederich who has been assigned to work with the Drinking Water and Groundwater Protection Division and will help with the Wastewater System and Potable Water Supply Rules (WW Rules). Kacie is an experienced Attorney with 7 years of work in the Vermont Attorney General's Office

Minutes:

The draft minutes of the February 25, 2025 meeting were reviewed and approved with edits. The draft minutes of the March 11, 2025 were approved with edits.

Guidance Documents:

Chris Tomberg has been working with the Public Water System section to standardize the isolation distances between the WW Rules and the Public Water Supply Rules. There will be draft guidance issued that will circulate to the Technical Advisory Committee (TAC). This will clarify that grass covered areas, such as swales, are not subject to the Stormwater Rules. Landscape features need to be considered when siting stormwater components, wastewater systems, and potable water supplies. Craig J. asked if there are any discussions about using a two-year time of travel, or other method, that would allow for a reduction in separation from stormwater features and potable water supplies. The current stormwater rules do not include any process for a reduction in isolation distance. Bruce answered that this guidance will only pertain to considerations when designing wastewater system and potable water supply components relative to stormwater components. However, they will not pertain to permitting requirements within the stormwater rules.

Bruce said that a guidance document will be issued to clarify §1-302 related to building reconstruction and replacement. Per the current draft guidance document, properties with an existing permit issued under the WW Rules, or under a qualifying municipal permit, are not subject to the 4-year limit on reconstruction provided the project is reconstructed in accord with the existing permit.

Innovative/Alternative:

There are no pending applications that are ready for review by the TAC. David Swift is working on issuing the renewals for the currently approved technologies.

Wastewater Pathogens Review:

Bruce said that in response to the question raised by the overshadowing subcommittee members: states do consider viral reduction as part of their wastewater system reviews. Bruce stated that he was recently in contact with the Massachusetts Alternative Septic System Technology Center (MASSTC) and learned that in addition to the information they have collected over many years, they will soon be issuing the results of a major study on logs of pathogen reduction based on various disposal systems and soil conditions. Bruce was able to participate remotely in a conference recently held in Florida that looked at pathogen reduction from wastewater systems, including viral reduction. Jeff asked if any of the data affects how the two-year time of travel between a wastewater system and a potable water source is calculated. Craig H. noted that this issue was studied in the past but there was no conclusion on the details needed to implement a simplified method for approving a reduction in isolation distance. Bruce said that the two-year

time of travel requirement was based on research regarding the rates at which viral concentrations decrease over time. This attenuation of pathogens, such as viruses, is typically described as logarithmic reduction values (LRVs) or logs of reduction. One log reduction, or one LRV, is equal to a ten-fold reduction in pathogen concentration. He said that once DEC assembles pertinent recent literature and research results, the required level of pathogen attenuation should be discussed with the Vermont Department of Health to determine if the two-year time of travel and the current isolation zones are still considered to provide the proper amount of reduction in viral contamination.

Portable Toilets:

Bruce noted that with the arrival of Spring, portable toilets are reappearing along with the question of when they are subject to permits and when they are exempt. A portable toilet, because it does not discharge waste on or into the soil, is not considered to be a wastewater disposal system. Placement at a location without a building or structure, such as at a fishing access, does not require a permit. A portable toilet cannot be approved as the wastewater disposal system when there is a building or structure that is required by the WW Rules to have a wastewater system unless there is an exemption in §1-304 for the specific use. Examples include buildings used for a short time at a construction site, sites for outdoor activities such as a golf driving range, or farm stand. There is an exemption for toilets located at remote camping and hiking locations when the land is owned by the State or Federal Government.

Rule Update Work:

Bruce said that each of the Regional Offices has completed the task of reviewing the rules from a number of other states. The staff concluded that Vermont's WW Rules are comprehensive and based on current knowledge. One goal of the review was looking for examples that were easy to understand and apply. Virginia's rules appeared to the Regional Engineer who reviewed them, to be well written.

Jared suggested that AI be incorporated so that a person with a question can be guided to the appropriate sections of the WW Rules. Bruce said that the State has people who can work on this issue. Bruce said that he is thinking of a general reorganization of the WW Rules with a goal of bringing all the information related to a specific type of system together. Gunner said this would be very helpful.

Sille asked about the continuing education requirements and suggested that they be focused on information related to the WW Rules. Bruce said that at least 4 of the 12 hours of training is specifically directed to soils knowledge and that credits for other training are only approved if there is some relation to the requirements in the WW Rules.

Jared asked if nutrient removal from the wastewater prior to discharge will be included in the updated WW Rules. Levels of nitrogen contamination above the State standards for drinking water are found occasionally. Tom said that the elevated levels are usually associated with

agricultural operations. Tom and Craig H. said that backyard poultry operations occasionally have high levels when they do not maintain separation between the animals and the water source. Bruce said that he does not believe there are major concerns about groundwater or surface water contamination from wastewater systems regulated under the WW Rules, therefore, there are no current plans to require nutrient removal technologies for wastewater systems under the WW Rules. Craig H. said that nitrogen and other contaminants are controlled under the larger (6,500 gallons per day or more) wastewater disposal systems that are subject to the Indirect Discharge Rules (IDR).

The next meeting will be May 20, 2025.

Approved Minutes of the Technical Advisory Committee Meeting

May 20, 2025

Participation by videoconference

Attendees:	Bruce Douglas*	Frederic Larsen
	Craig Jewett*	Sheri Young*
	Ernie Christianson*	Roger Thompson*
	Kassandra Diederich	Julia Beaudoin*
	Mark Bannon*	Jared Willey*
	Sille Larsen*	Gunner McCain*

*Technical Advisory Committee members or substitutes

Scheduled Meetings:

All meetings are scheduled as virtual meetings.

June 17, 2025	2-4 PM
July 15, 2025	2-4 PM
September 16, 2025	2-4 PM
October 21, 2025	2-4 PM
November 18, 2025	2-4 PM
December 16, 2025	2-4 PM

Agenda:

The proposed agenda was accepted as drafted.

Minutes:

The draft minutes of the April 15, 2025 meeting will be reviewed at the next meeting.

Innovative/Alternative:

David Swift has completed issuing the renewals for the currently approved technologies. The Innovative/Alternative technology approval for the use of processed glass aggregate will be revised at the request of the Chittenden Solid Waste District. The Pilot Approval status will continue to allow use of the material in up to 25 systems. Sheri asked that the approval clearly state that the use of processed glass would not be considered a disposal of waste under the Solid Waste Rules. Bruce said that the Solid Waste Division agrees with Sheri's request.

Soil Study:

Bruce reported that the Lake Champlain Basin Program (LCBP) is supporting a study that will be evaluating fine grained soils, and suggesting an appropriate long term linear loading rate, starting this summer. Stone Environmental is the primary contractor with University of Minnesota's onsite wastewater personnel on the team as subcontractors. They are looking for sites with silt loam, silty clay, and clay soil. After selecting representative sites, they will perform field tests to determine the hydraulic capacity. The information collected will be included in an evaluation of the Simplified Method of Completing and Hydrogeologic Analysis (§1-927 of the WW Rules) that will decide if an update is needed. Sheri said that she worked on a study of about 75 sites some time ago that should provide useful information on this topic. Julia said that the Vermont Geologic Survey also has some information on the topic.

Training Opportunities:

The LCBP is working on training opportunities for Licensed Designers and municipal officials. Spencer Harris has proposed a site in Starksboro for soil training. Bruce said that it is easier for a private group to organize a training session that includes test pits than the Department of Environmental Conservation (DEC). Jared said that the Yankee Onsite Wastewater Association (YOWA) might want to help create training opportunities.

Housing Issues:

Bruce reported that the Vital Communities Organization, a group of 69 communities in the Upper Connecticut River Valley of Vermont and New Hampshire, organized a workshop on issuing including water supply and wastewater disposal systems. Bruce did a presentation. The discussion included how to make approvals for municipal connections and soil-based wastewater disposal systems more efficient. A video presentation of the meeting is available online. Sheri asked if Licensed Designer Training Credits could be issued for those viewing the video. Bruce will check on this.

Licensed Designer Program:

Bruce said that the responsibility for managing the Licensed Designer Program is with the Office of Professional Regulation. Creation of training opportunities, approval of training created by others, and certification examinations remain with the DEC. This work has been transferred from Cristin Ashmankas to David Swift.

Potable Water Supply and Wastewater Disposal System Rule (WW Rule) Update:

Bruce discussed how to improve stakeholder involvement in the development of the WW Rules and how to demonstrate that the purpose of the WW Rules is to enable development that protects public health and the environment rather than to restrict development. The statutory requirements for adoption of new or updated rules require an outreach to affected parties early in the process

before drafting of the proposed rules. There is an additional comment period after the Interagency Committee on Administrative Rules (ICAR) reviews the draft rule to determine that there are no conflicts with other Departments of State Government. The TAC suggested contacting other groups such as Licensed Designers, the Vermont League of Cities and Towns, excavating contractors, Licensed Well Drillers, and septage pumpers. Discussion with the Public Water Supply Section is important. Ernie said that during a previous rule update standard language that could be used in the WW Rules and in the Public Water Supply Rules was agreed on. Sille said the changes have not been implemented because the Public Water Supply Rules have not been updated since the agreement was made.

Technical Advisory Committee Membership:

Bruce said that the position on the TAC representing municipalities has been vacant for some time, despite efforts to recruit a member. He would like to see this position filled and asked the TAC for any suggestions of people who might accept the position. Sheri suggested contacting the Vermont League of Cities and Towns.

Old Business:

Bruce asked the TAC members to review and comment on the proposed guidance on separation between water and wastewater systems and components of stormwater systems. The draft guidance was emailed to TAC members. Bruce asked that any comments be submitted by June 13th.

New Items:

Gunner asked about the separation required between leachfields and 30% or greater slopes when the slope is uphill from the leachfield. Bruce said the WW Rules allow for a reduction based on site specific conditions when the presence of the slope did not endanger the leachfield.

Bruce said he is looking into ways to minimize the burden on landowners, Licensed Designers, and DEC staff when a limited modification of an existing permit is needed. This includes both the administrative burden and the size of the application fee. Application fees are set by State Statute so any change will require legislative action. Bruce discussed a general permit approach. Applications meeting certain requirements, certified by a Licensed Designer, would be issued a permit without any technical review. Compliance with the WW Rules would be ensured by auditing a portion, maybe 10%, of the submitted applications. Sille said that even a quick glance at the application sometimes reveals a problem and it is very hard for the staff to then just issue a permit because it qualifies for a general permit approach. Craig J. said that he has used the general permit approach on some public water system applications, but it might not work as well for the WW Rules. Roger asked how many of the applications currently being filed required review letters and revisions. Bruce said it is a fairly large portion of the applications. This suggests that a large portion of the audits would find problems and lead to questions about how many of the unaudited applications are deficient. The TAC agrees that there are requests for

permit revisions that involve only minor changes and is supportive of a search for a way to reduce the burden on everyone. Ernie said that this issue was reviewed in the past without a good resolution, but the documents should be available in the DEC files which would give the history of past discussions. Craig J. suggested starting by looking for one or two situations that have an easy solution and implementing those changes first, rather than looking for a global solution.

Approved Minutes of the Technical Advisory Committee Meeting

June 17, 2025

Participation by videoconference

Attendees:	Bruce Douglas*	Gunner McCain*
	Sheri Young*	Roger Thompson*
	Jeanne Allen	Craig Heindel*
	Jenneth Fleckenstein*	Denise Johnson-Terk
	Tom DeBell*	Terry Shearer
	Julia Beaudoin*	Cristian Ashmankas
	Alex Torpey	Craig Jewett*
	Jared Willey*	Sille Larsen*
	Frederic Larsen	Steve Revell*

*Technical Advisory Committee members or substitutes

Scheduled Meetings:

All meetings are scheduled as virtual meetings.

July 15, 2025	2-4 PM
September 16, 2025	2-4 PM
October 21, 2025	2-4 PM
November 18, 2025	2-4 PM
December 16, 2025	2-4 PM

Agenda:

The proposed agenda was accepted as drafted.

Minutes:

The draft minutes of the April 15, 2025 meeting and the May 20, 2025 meeting were accepted.

Innovative/Alternative:

There are ongoing communications between the Department of Environmental Conservation (DEC) and vendors though no applications for new technologies have been filed since the previous meeting of the Technical Advisory Committee (TAC).

Permitting Improvements:

Bruce introduced Alex Torpey. Alex founded Rethink Local (rethinklocal.us), an organization that can provide support services to municipalities. The services include helping set goals, organizing public outreach, serving as an interim municipal manager or administrator, and other support functions. In addition, the organization provides free information and workshops to help applicants and municipalities with planning and permitting work.

Alex discussed a series of ideas. One is to help individuals who are not familiar with the development process and may not have any idea on how to start the process. He suggested that a checklist format might be developed and possibly a list of good designers and contractors. Craig H. said that these lists should not be on the State website because that might suggest an endorsement of those listed. Alex agreed. Alex suggested that a website could be developed using the State PDF lists of Licensed Designers, Well Drillers, and service providers with the information converted into an Excel format that would be more easily used by members of the public. Roger said that the Permit Specialist Program from several years ago did a lot of work that might help with a checklist. Bruce said that a State permit manual will be available online. Craig H. added that the project review sheet that was used by the Permit Specialists has been replaced by the Permit Navigator Program that is available online. Alex asked if there is a place to go for people starting from scratch. Sheri said that the Permit Navigator program is for use by applicants as well as Licensed Designers. Jared suggested that a YouTube channel might be useful.

Municipal Water and Wastewater Connections Group:

The group is continuing to work on issues related to the delegation of permitting authority to municipalities for projects using both municipal water and wastewater system connections. The Legislature authorized $50,000 to fund a design manual for Licensed Designers with the design requirements for the water and wastewater connections. This would make municipal design and review easier. As currently envisioned, the design manual will feature graphic presentations that could be the basis of plans prepared by Licensed Designers. This information might support a general permit approach for these projects, or use of a minor project permit. Either approach could reduce the workload for the Regional Office staff who are continuing to deal with a large number of applications. There are about 250 applications per year that could be delegated to the municipalities if they are interested. Other sources of design information include the TR-16 manual from the New England Interstate Water Pollution Control Commission (NEIWPCC) or the Ten State Standards manual from the Great Lakes Upper Mississippi River Board (GLUMRB).

Craig J. said that not all towns follow the rules in the same way. A design document might help Licensed Designers support the design they have prepared. He also noted that water and wastewater capacity allocation letters are sometimes issued without an understanding of how a project might affect the operation of the system. The water source or the wastewater treatment plant might have sufficient capacity but the piping, pumping, or other issues may not be adequate. Sille said that Licensed Designers can contact the Regional Office staff to learn if the water system is subject to a connection moratorium.

Guidance Documents:

Bruce said that there are routine requests for more guidance documents. He is working on guidance for reconstruction/replacement of buildings and for compliance with stormwater requirements. Bruce said that the DEC is working on a standardized process for developing guidance documents and asked for any suggestions of topics to be addressed. Sheri said that one issue is §1-908(a)(5) that requires an increase in septic tank capacity when a pump discharges to the septic tank but does not give any information on how to determine how much additional capacity is required. Bruce said that some designers find the design flow tables difficult to apply to some projects. Sheri said that there needs to be a process that can balance the need to fix a failed wastewater system with the requirements for wetland and habitat protection. Craig J. agreed. The Vermont Atlas and the Permit Navigator system identify some issues but do not point a Licensed Designer to a specific person who can provide needed information.

Old Business:

Sheri asked about Spencer Harris's suggestion of a location for test pit training. Jared is in contact with Spencer relative including this in Yankee Onsite Wastewater Association (YOWA) training. Bruce has visited the site with Spencer, and it is a possible site for a training workshop.

Sheri asked if sand filter maintenance inspections must be done by a Professional Engineer. It depends on the language in the permit. The current WW Rules require annual inspections to be conducted by Class 1, Class B, or Class BW designers, Bruce stated that the eventual goal is to allow Service Providers to do this work, but this would require a training opportunities for service providers and the designation of service providers in a rule revision.

Terry said that the templates in the WW Rules need to be updated. Denise agreed noting that some Licensed Designers are just using an existing template that may not be quite adequate for a particular project.

Craig J. said that there has been some questions about when a project requires an inspection by a Professional Engineer. Must the inspection be done personally by the engineer or can it be done under the direction of a Professional Engineer? Bruce will look into this.

Bruce asked if there is any reason to change the TAC meeting schedule from monthly to bi-monthly or to quarterly. The group said that monthly meetings are reasonable, but that if Bruce determines that there is little to discuss he can cancel a meeting.

Sheri asked if the DEC is working to bring more I/A systems to Vermont. Bruce replied that there are no funds to recruit for new systems. Jared added that all the good systems are already approved in Vermont.

Approved Minutes of the Technical Advisory Committee Meeting

July 15, 2025

Participation by videoconference

Attendees:	Kevin Eaton	Roger Thompson*
	Bruce Douglas*	Sheri Young*
	Denise Johnson-Terk	Ernie Christianson*
	Tom DeBell*	Terry Shearer
	Steve Revell*	Julia Beaudoin*
	Gunner McCain*	Michael Charbonneau
	Mark Bannon*	Craig Jewett*

*Technical Advisory Committee members or substitutes

Scheduled Meetings:

All meetings are scheduled as virtual meetings.

September 16, 2025	2-4 PM
October 21, 2025	2-4 PM
November 18, 2025	2-4 PM
December 16, 2025	2-4 PM

Agenda:

The proposed agenda was accepted as drafted.

Minutes:

The draft minutes of the June 17, 2025 meeting were accepted. Steve noted the comment in the minutes from Craig J. about whether the requirement that an inspection be done by a Professional Engineer (P.E.) meant that the P.E. must be present for the inspection or that it could be done under the supervision of the P.E. Steve said that his understanding, based on the P.E. regulations. is that there is no question that the inspection can be done under the supervision of the P.E. and that he was unaware of this being challenged. Gunner agreed with this. Bruce asked if the Regional Offices had encountered this. Terry said that only time it comes up is when an inspection is done under the supervision of a P.E. that did not have the soil certification who also did not have a Licensed Designer doing the soil work. Craig J. said that David Swift raised the

issue for inspections required for permits issued under the Indirect Discharge Permit Rules, otherwise it is not a problem.

Innovative/Alternative Technology:

Bruce said that David Swift is still working on an update for the approval issued to the Chittenden Solid Waste District to use recycled glass.

Bruce said that the Gates Foundation started a grant program in 2012 that funded several groups to look at alternative toilets. There is ongoing interest in this topic in Vermont. Bruce said that the former President of Infiltrator Wastewater Technologies contacted him and asked about the requirements for non-potable reuse of treated wastewater. Bruce told him about the treatment system at the Sharon Interstate Rest Area.

Design Manual:

The creation of a Design Manual that might be useful for Licensed Designers and for any municipality that decides to take permitting authority for projects using both municipal water and wastewater connections was discussed. Bruce said that the Vermont Legislature approved $50,000 for this project and that the DEC is preparing a request for proposals (RFP). The goals are to improve design consistency, be designer friendly, and include lots of diagrams to provide clarity. Sheri asked when the manual will be ready, and Bruce said the target is to be done within two years. Roger asked if the information in the Design Manual will be binding on a municipality that takes permitting authority, and Bruce said it would not. Craig J. said that consistency among town reviewers would be very helpful to Licensed Designers. Bruce said that in addition to the Design Manual there is still interest in some type of general permit approach because there is a lower risk related to projects using both municipal water and wastewater systems.

Technical Advisory Committee (TAC) Membership:

Bruce has recruited two people for inclusion on the TAC. Chris Campany is the Executive Director of the Windham Regional Planning Commission. Seth Jensen is the Deputy Director of the Lamoille County Planning Commission. Their names, along with the names of all current members of the TAC, will be sent to Governor Phil Scott with a request that all be appointed or reappointed to the TAC.

Guidance Documents and Fact Sheets:

Guidance Documents are used to clarify and interpret the Wastewater and Potable Water Supply Rules (WW Rules). These must be recorded at the Secretary of States Office. Fact sheets summarize portions of the WW Rules that apply to a specific type of project to help applicants begin the application process.

Bruce said that guidance documents related to Accessory Dwelling Units (ADU), the fees related to applications for areas for replacement wastewater disposal systems, and the requirements for replacement of failed wastewater systems have been issued. Coming soon will be guidance on replacement and reconstruction of buildings that are subject to existing State permits and some municipal permits. This will allow for replacement or reconstruction to occur in accord with the existing approvals without applying the 4- or 5-year deadline in §1-302 of the WW Rules. Guidance Documents may be seen at:
Wastewater System and Potable Water Supply Guidance Documents, Procedures, and Practices | Department of Environmental Conservation

Fact sheets have been issued related to accessory dwelling units, campsites and campgrounds, common waterless toilets, food and lodging permits, short-term rentals, food trucks, common waterless toilets, chemo-therapy and antibiotic drugs, and septic tanks. These fact sheets are also currently on-line.

Bruce asked for suggestions on additional guidance documents and fact sheet. Suggestions were:

Guidance documents

1. The simplified method for hydrogeologic analyses
2. Designer and reviewer responsibilities
3. Boundary line adjustments
4. Composting toilet use
5. Water source construction and yield testing

Fact sheets

1. High strength wastewater
2. Replacement areas
3. Permit triggers
4. Tiny homes

Tom said that tiny homes is a good topic. He noted that some of the available units do not include standard interior plumbing systems. He suggested having something online that would pop up for those researching the topic.

Bruce reviewed the process used to develop guidance and fact sheets.

1. Identify a need
2. Prepare an outline
3. Review with Program Director and legal counsel

4. Prepare a draft
5. Review draft with Regional Office staff
6. Review with the TAC
7. Final review with Program Director and legal counsel
8. Notify TAC and Licensed Designers and post on the Department website.

The TAC suggested that circulating to Licensed Designers prior to issuing as a finished product might find and correct some errors. Sheri said that with everyone so busy there might not be a lot of comments from Licensed Designers.

Old Business:

Sheri asked about the status of the mound sand report that was done a couple of years ago. Bruce said that Mary O'Leary had not been able to complete the work in the time she had available but had prepared a draft of the work that was completed. Sheri said that the cost of mound sand is an extremely urgent issue in her area of the State. She saw a recent bid for a single-family system of $93,000 and bids of $60,000 to $70,000 are common. The main problem is the lack of nearby sand, A 4 hour round trip between the sand source and the project site not uncommon. Steve asked that the completed portion of the report be circulated to the TAC.

Kevin suggested updating the WW Rules to allow for additional loading rates for sand not meeting the current sieve specifications. One concern is that if coarser material is approved there may rapid flow down to the water table. Roger suggested that changes to the pressure distribution network or use of drip dispersal systems might offset the use of coarse material. Jared suggested different loading rates for treated effluent. Jared also reported that small diameter distribution pipe with 1/8" orifices do not have a clogging problem. Michael said that New Hampshire requires the removal of the "A" layer of soil before placing the mound sand. Sheri said that in many of her systems, the "A" layer is the only soil that is permeable enough to meet the WW Rules. The TAC agrees that any changes should not reduce the treatment efficiency which is needed to protect water sources and groundwater quality.

The TAC agrees that the cost of mound systems, particularly in areas lacking approvable sand, is an urgent problem and suggests that the Department make this a priority.

Bruce reported that there will be soil training session on September 4th in Starksboro. More information will be available soon. The training will be approved for continuing education requirements for Licensed Designers.

The TAC discussed the conflicts between Agency of Natural Resources programs that sometimes occur when a failed wastewater system must be replaced. Bruce said that the WW Rules require that all projects comply with all requirements of rules from other portions of the Agency which include surface water, wetlands, animal and plant habitat, and others. While changing the rules to allow an approval that balances the competing interests of various programs would require rule

and/or legislative changes, the TAC suggest asking other programs to fast track their portion of the review so that an existing health hazard can be remediated as soon as possible.

Next Meeting: September 16, 2025

Approved Minutes of the Technical Advisory Committee Meeting

September 16, 2025

Participation by videoconference

Attendees:	Bruce Douglas*	Terry Shearer
	Julia Beaudoin*	Tom DeBell*
	Jared Willey	Scott Davis
	Roger Thompson*	Craig Jewett*
	Sheri Young*	Chris Campany*
	Jenneth Fleckenstein*	Sille Larsen*
	Alex Torpey	Gunner McCain*
	Denise Johnson-Terk	Craig Heindel*
	Kevin Eaton	Evan Bollman
	Frederic Larsen	Mark Bannon*
	Seth Jensen*	

*Technical Advisory Committee members or substitutes

Scheduled Meetings:

All meetings are scheduled as virtual meetings.

October 21, 2025 2-4 PM
November 18, 2025 2-4 PM
December 16, 2025 2-4 PM

Agenda:

The proposed agenda was accepted as drafted.

Minutes:

The draft minutes of the July 15, 2025 meeting will be reviewed at the October meeting.

New TAC Members:

Bruce introduced Chris Company, Executive Director of the Windham Regional Planning Commission. Chris said that he is interested in water supply and wastewater disposal issues because they are critical for increasing housing development which is supported by Legislative action. Bruce also introduced Seth Jensen, Deputy Director of the Lamoille County Planning Commission.

Innovative/Alternative Technology:

Bruce said that there are no updates related to I/A Technology though David Swift is still working on an update for the approval issued to the Chittenden Solid Waste District to use recycled glass.

Field Training Program:

Yankee Onsite Wastewater Association conducted a workshop on Layered Landscapes: Soils, Waters, and Wastewater Regulation on September 4, 2025. The workshop was held at Lewis Creek, Cota Field in Starksboro. Bruce noted that several TAC members and former members including Spencer Harris, Steve Revell, Sheri Young, and Jared Willey helped organize and conduct the workshop.

Design Manual:

Bruce reported that work is continuing on writing the scope of services statement that will be advertised as a request for proposals to create a design manual for water and wastewater systems. This manual could be used by Licensed Designers and municipal and state reviewers and would specify basic designs that can be approved. Bruce hopes the proposals will result in a practical manual that will be useful in the permitting process.

Guidance Documents:

Bruce said that he is working on a guidance document for the restarting use of existing wastewater systems that have been out of service for a period of time.

A guidance document on the relationship between the WW Rules and the Stormwater Regulations is expected soon.

Mound Sand:

The cost and availability of mound sand has been a major concern for many years. A study was commissioned, and a draft report was prepared in 2023. The report was circulated to the TAC. Bruce said there is about $22,000 that could be used to finish the report.

Bruce asked if the changes made to the mound sand specifications over the years had helped. Gunner said that the changes had been useful, and others agreed. One problem is that suitable mound sand is not evenly distributed across the state and is lacking in some portions of the state where mound systems are most used. Roger asked what portion of the cost of a mound is related to cost of the sand. Gunner said that about 1/3 of the cost for systems he designs is related to the sand while Sheri reported that for some of her systems it is as much as 7/8 of the total cost. The

trucking costs are high for areas without a local supply, and those areas also tend to require more sand to offset the poor soil conditions.

Bruce asked if there are pit owners who should be contacted to discuss their issues with providing sand.

Jared said that use of drip dispersal within a mound reduces the amount of sand required. Craig J. said that only about 50% of fill needed to construct a mound must be mound sand which can reduce the total cost.

The compliance with the specifications of sand offered for sale as mound sand was also discussed. The frequency of testing is not specified in the WW Rules and varies from pit to pit. In some cases, the source material is very consistent and in others it can vary almost from truckload to truckload. Sheri said that not all sieve testing is done using the wet sieve method and therefore is not consistent.

Sheri noted that while the presence of fines in the mound sand is a concern, the WW Rules only require filter fabric to be installed over the crushed stone leachfield area rather than between the sand fill and the topsoil cover over the whole filled area. It was also noted by Jared that when using drip dispersal no filter fabric is required.

Mound Sand Alternatives:

Jared said that processed glass aggregate (PGA) should be considered. Maybe it could be used for one of the replacement systems for the village of West Burke. Bruce noted that Londonderry North Village could be a candidate for PGA. Bruce said that it would be useful to know the cost breakdown between crushed glass and mound sand.

Gunner said that the WW Rules allow for alternative materials in lieu of mound sand when approved by the Secretary of the Agency of Natural Resources. This might allow for use of sand that is functionally equivalent even when it does not meet the exact sieve specifications for mound sand. Jared said that there are many intermittent sand filters in use that have collection ports that would allow testing of the effluent quality. His experience is that effluent quality appears to be very good which supports the use of sand not meeting mound sand specs.

Drought Conditions:

Julia said that much of Vermont is in drought and in some of Vermont the conditions are severe and are shown on a national website (https://www.drought.gov/states/vermont). The Vermont Agency of Natural Resources has a website with drought resources (https://anr.vermont.gov/disaster/drought#data). The Drinking Water Division monitors groundwater levels and there is a new website where people can report water limitations and outages (https://anr.vermont.gov/disaster/drought#report). About ¼ of the reports are for drilled wells. These reports are usually for limited water capacity rather than full outages. Sille said a

Vermont task force has been active for a month and is helping those without water. Craig H. said that adding the names of water hauling companies to the website would be useful. Sille suggested that short term approval allowing out of state well drillers to operate in Vermont might be helpful.

New Business:

Craig H. said that the website for new fact sheets is not easy to find. Guidance documents have their own tab and maybe fact sheets should as well. Alex said that any document should only be posted in one location and any mention of the document in other locations should be linked. Posting in one location means that updates only need to be made in one place rather than searching across the entire site.

Bruce noted that the fine textured soil study is underway. Stone Environmental is doing the work and is looking for sites. Sheri suggested looking at State owned land if private landowners are reluctant to participate.

Sheri asked about the Permit Navigator website. Until recently use of the website was required as part of every permit application. Use of the website will be voluntary in the future.

Next Meeting:

The next TAC meeting will be October 21, 2025.

Approved Minutes of the Technical Advisory Committee Meeting

October 21, 2025

Participation by videoconference

Attendees:	Bruce Douglas*	Terry Shearer
	Sheri Young*	Gunner McCain*
	Jared Willey	Craig Heindel*
	Tom DeBell*	Roger Thompson*
	Jeff Williams	Chris Campany*
	Larsen*	Seth Jensen*
	Julia Beaudoin*	Cristian Ashmankas
	Megan Kane	

*Technical Advisory Committee members or substitutes

Scheduled Meetings:

All meetings are scheduled as virtual meetings.

November 18, 2025 2-4 PM
December 16, 2025 2-4 PM

Agenda:

Bruce said that there is a prescribed, statewide agenda format that he is now using. The proposed agenda was accepted as drafted.

Minutes:

The draft minutes of the July meeting were accepted as drafted. The draft minutes of the September meeting were accepted with edits.

Innovative/Alternative Technology:

Bruce said that there are no significant new proposals for I/A approval. He is working on a standard approach for use of the Terralift system.

Design Manual:

Bruce said that he is finalizing the scope statement for the request for proposals of a design manual. The manual is intended to help municipalities that assume permitting authority for projects using both municipal water and wastewater systems. As currently drafted, it will include typical details of various portions of water and wastewater connections. It will also reinforce the Wastewater System and Potable Water Supply Rules (WW Rules) that state that alternative designs can be approved if supported by national or regional standards as specified in the WW Rules. Accordingly, the WW Rules will allow some design variations between different municipalities. Seth said that the design manual will be useful to applicants as they gather information on what is required for their project. Bruce said that the Agency is still proposing the general permit approach and is working on details such as how to determine if designs follow the WW Rules. Sheri asked if municipalities would be required to approve designs in the Design Manual. Bruce said that they are only examples. Sille said that the Vermont Department of Health started using a general permit approach in 2022 for a limited range of work. Jeff said that the American Water Works Association (AWWA) has developed standards that operate by defining the required performance and allowing designers to propose various ways of meeting the required performance. This ensures good results while allowing for innovation in designs.

Mound Sand Report:

Bruce said that there is $22,000 that can be used to complete the mound sand report. One topic to be covered is how the mound sand specifications were set and if they can be made more permissive while ensuring proper treatment of the wastewater before it reaches the groundwater.

Promoting Housing Construction and Rehabilitation Executive Order:

Governor Scott issued an Executive Order intended to increase availability and reduce cost of construction and rehabilitation. https://governor.vermont.gov/document/executive-order-no-06-25

Bruce is part of a Department of Environmental Conservation (DEC) team working on an implementation guide. One goal of the Order is to reduce permitting times to 50% of the existing performance standards. Bruce reported that the Regional Office existing performance already meets these reductions for the most part. Sille said that the Public Water Supply Program uses a general permit with a 14-day standard. While the staff does their review within the standard, the required public notice waiting period results in permits being issued in about 20 days. One requirement of the Executive Order is to allow for simultaneous reviews by all the permitting agencies as opposed to one group waiting until another group finishes their review. WW Permits do not depend on issuance of other permits except when a public water source permit is also required, which is specified in the Executive Order. Until the source location is approved, wastewater systems cannot be properly located. The Executive Order also prioritizes review of housing. Roughly 80% of permits under the WW Rules are for residential housing. Review of the Act 250 process is part of the Executive Order. Sheri asked if an application must appear on

the Environmental Notice Board for a specific length of time, which might be a factor in how quickly a permit can be issued. Seth suggested checking the Indirect Discharge Permit public notice requirements and timeline. He said that applicants with smaller projects subject to Act 250 struggle less with getting a permit under the WW Rules than other requirements. If Act 250 would issue some permits subject to compliance with other permitting programs it would speed up the process. Bruce said that some time ago it was determined that WW Permits would have a rebuttable presumption of compliance with Act 250 conditions. This meant that an applicant did not have to demonstrate to Act 250 that the WW Permit complied with the WW Rules which reduced the burden of the Act 250 process. Gunner said that the Executive Order seems to direct Act 250 to issue permits with conditions without waiting for other permits to be issued.

Tom asked about a checklist that designers and applicants could use in preparing an application. Bruce said that a checklist was created years ago and used for a while, but it was not very effective. Gunner said that a checklist can become too complex but is still useful. He said that he randomly looks at applications filed in each of the Regional Offices and noted that while many of the applications do not include all the required information they are approved. Bruce asked Gunner to send him a marked up copy of the checklist with his recommendations. Bruce said that constructability should be considered during the permit review.

New Business:

Sheri asked about the wastewater loading rate for channery silt loam. Channers are rock fragments that are flat in shape and between 2 millimeters and 150 millimeters (approximately 1/16th to 6 inches) in the long dimension. Bruce said that a process is needed to look at subgroup soil loading rates. This would help determine when the presence of channers increases the capacity of soil to accept wastewater. Craig said large scale trench test studies found that some sites with a large amount of stone fragments had somewhat larger horizontal hydraulic capacity. Julia asked about when there are so many rock fragments that is not classified as soil. The Field Book for Describing and Sampling soils says that if there is 10% or less of fine earth (sand, silt, clay) particles the material is described using the rock fragment description without reference to the fine earth particles. The Department of Environmental Conservation (DEC) also considers sites where the rock is so heavily weathered that it can be excavated with a backhoe, but which retains the layering or structural appearance of bedrock, as being bedrock. Bruce said that a channery soil has between 15% and 35% of channers and he also mentioned that the hydraulic capacity of a silt loam varies depending on the parent material.

Bruce said that a decision has been made to require employees to return to their office for a majority of their work week beginning on December 1st. There may be some discussion at the beginning of next year about when a person can work remotely. Time spent doing field work will count towards office hours. Sheri asked about loss of staff and Bruce said that there are a few people who will most likely decide not to return.

The next TAC meeting will be November 18, 2025. Bruce said he is considering a hybrid in person/online meeting in the future if there is interest. Several members would like an in-person option.

Approved Minutes of the Technical Advisory Committee Meeting

November 18, 2025

Participation by videoconference

Attendees:

Eric Deratzian	Bruce Douglas*
Kevin Eaton	Craig Jewett*
Craig Heindel*	Ernie Christianson*
Gunner McCain*	Jenneth Fleckenstein
Roger Thompson*	Julia Beaudoin*
Steve Revell*	Sheri Young*
Tom DeBell*	Terry Shearer
Dennis Hallahan	Mark Bannon*
Jared Willey*	Megan Kane
Cristian Jabolonski	Jonah Richard
Jared Willey*	Evan Bollman
Cristin Ashmankas	

*Technical Advisory Committee members or substitutes

Scheduled Meetings:

All meetings are scheduled as virtual meetings.

December 16, 2025 2-4 PM

Agenda:

The agenda was accepted as drafted.

Minutes:

The draft minutes of the October meeting were accepted as drafted.

Innovative/Alternative Technology:

Bruce said that there are no new proposals for I/A approval. David Swift is working on an update of the Chittenden Solid Waste District's approval for the use of crushed glass that will change the approval from a pilot use approval to a general use approval.

Leachfields Under Parking Lots:

Bruce said that the issue of having leachfields under parking lots is under discussion due to a conceptual proposal for Innovative/Alternative approval. This proposal is timely due to the Governor's Executive Order related to housing issues. Leachfields require a lot of space, and when trying to increase the amount of infill in already developed areas once a building footprint is defined the parking area can be all or most of the remaining open space. Bruce asked about prior discussions and Ernie said that the issue has been reviewed. There were concerns about lack of oxygen transfer and soil compaction and the issue was not pursued. Craig H. shares Ernie's recall and wonders if the issues might be solvable with current technology. The issue of oxygen transfer in leaching beds not under parking areas has been studied and the transfer is limited. Using pretreated effluent might reduce the need for oxygen transfer.

Jared said that leaching chambers are used in surrounding states and venting can be used. With proper design, they are safe for heavy vehicles. Dennis works for the Infiltrator Water Technologies and says that Gillette Stadium uses a large chamber system disposing of highly treated effluent with a one million gallon per day capacity without any problems. Jonah said that where he works in the Fairlee area, allowing construction under parking areas would help infill development. Tom asked about maintenance and reconstruction costs. Dennis said that the systems have access points and are easy to monitor and that reconstruction is more expensive. He noted that the life expectancy of the systems is the same as those not under parking areas.

Craig J. said that developed areas are often underlain by soil with limited hydraulic capacity and some areas use individual water sources. Some combination of advanced treatment of the effluent, community disposal systems, and community water systems could allow for more infill construction. Craig H. said that the existing separation requirements to groundwater should not be waived.

Old Business:

Bruce said that the Design Manual Request for Proposal (RFP) is nearly ready to be issued. The proposal requires that public input be solicited. The use of a general permit approach is recommended by the Municipal Water and Wastewater Connection Study Committee created in response to Act 47 of 2023 (Section 25), which Bruce worked with. It will include typical details and construction notes. Roger asked if the TAC should discuss the general permit concept and Bruce said he would add it to the agenda for the next TAC meeting. A municipal capacity approval for the municipal water and the wastewater systems is required for applications using those systems. There is significant variation from municipality to municipality in the wording and actual approval in these letters. Craig J. said the letters can be misleading and not protective of the municipalities' ability to meet water and wastewater requirements.

Guidance Documents:

Bruce said that proposed guidance documents for reconnection to existing wastewater disposal systems and for isolation distances related to stormwater management systems is ready for TAC review and will be circulated to the TAC.

Mound Sand:

Bruce is working on the details for an RFP to complete the mound sand study that was started a few years ago. The study should include stakeholder comments and analyze how the mound sand sieve size specifications were chosen. Sheri asked if educational institutions such as The Vermont State University at Castleton or Middlebury College could bid on this. Bruce said they could.

Leachfield Rejuvenation Systems:

Bruce said he wants to review the use of rejuvenation systems in Vermont. At least two systems, Terralift and EarthBuster®, have been used in Vermont though neither has been reviewed and approved for use under the WW Rules. The systems work by injecting compressed air into the soil around a leachfield that creates fissures in the soil allowing the effluent to move away from the leachfield. Jared said that there has been some benefit to using the Terralift system on sand filters. Gunner has used the EarthBuster system trying to "limp along" failing systems until the municipal wastewater system is available.

Updating the Soil Hydraulic Capacity Calculations:

Sheri said that she wants to pursue the question of whether soils with a significant portion of channers (flat, elongated rock particles – discussed in the minutes of the October TAC meeting) justify a change in a particular soil's hydraulic capacity. Bruce said that he wanted to include this in a broader review that looks at the effect soil genesis has on hydraulic capacity. He suggested creating a subcommittee to discuss this and asked for volunteers to contact him.

Executive Order 06-25 Promoting Housing Construction and Rehabilitation:

Bruce gave an update on the implementation of the Executive Order. The Order affects several Department of Environmental Conservation permits including those issued under the WW Rules and the Wetland Rules. Permit review times are to be reduced to ½ of the maximum allowed under their rules. Bruce said that the Regional Office permits already meet the required reduction in most cases. The Order addresses the restrictions in the Wetland Rules for construction in certain areas. The Order also affects some Act 250 review requirements, proposes reduction in some permit fees, and imposes other requirements intended to reduce the cost of development and the cost to obtain the permits needed for construction. Permits for housing development will be given priority in the review process. The permitting programs must also be reviewed and streamlined when possible. The review and implementation of changes must be completed by

July, 2026. Craig J. said that Regional Office permits do not hold up many projects, though there is room for a few small improvements, with bigger gains possible with changes in the Act 250 process.

Other Comments:

Sheri asked if the Governor has reappointed the TAC members. Bruce said that the request has not been sent to the Governor's Office, but it will be. Sheri asked if TAC members continue to receive two continuing education hours towards the licensing requirement and Bruce said that they do. Craig H. noted that the list of TAC members is not included on the new agenda form and Bruce said they would be added to the next agenda.

Bruce will schedule a meeting in the springtime that will be a hybrid in person and online meeting which the TAC supports.

The next TAC meeting will be December 16, 2025.

Draft Minutes of the Technical Advisory Committee Meeting

December 16, 2025

Participation by videoconference

Attendees:

Bruce Douglas*	Kevin Eaton
Julia Beaudoin*	Craig Heindel*
Terry Shearer	Cristian Jabolonski
Ernie Christianson*	Gunner McCain*
Dennis Hallahan	Jared Willey*
Roger Thompson*	Steve Revell*
Jenneth Fleckenstein	Tom DeBell*
Mark Bannon*	Evan Bollman
Chris Campany*	Craig Jewett*
Frederic Larsen	

*Technical Advisory Committee members or substitutes

Scheduled Meetings:

March 17, 2026 2-4 PM

This meeting will be a hybrid format with both in-person and online options. The in-person meeting will be held in Montpelier at National Life – on the fourth floor of the Davis Building in the Orange Room (# 413 – directly across the hall when coming out of the elevator/stairs hallway)

Agenda:

The agenda was accepted as drafted.

Minutes:

The draft minutes of the November meeting were accepted with minor clarifications and a correction that the update to the Chittenden Solid Waste permit for the use of crushed glass allows for an increased number of installations, but the approval remains as a pilot use approval.

Innovative/Alternative Technology:

Bruce said that there are no new proposals for I/A approval. David Swift has responded to the Infiltrator Company request for use under parking and driveway areas with a request for additional information. Dennis said that a response has been sent to David. Dennis said that he believes that a venting system provides more air to the system than occurs by passage through

the soil in an unvented system. The review of the update for the use of crushed glass is continuing. One issue is the current requirement to cover the crushed glass with soil within 24 hours. This requirement is related to the musty odor coming from the crushed glass. The requirement for soil cover within 24 hours is difficult to comply with in some cases, Alternatives such as use of filter fabric are being considered.

Old Business:

Bruce said that the study of fine-grained soils is continuing to look for sites to examine. These sites will be evaluated using point permeability testing. The goals are to find sites that can be developed that do not meet the current Wastewater System and Potable Water Supply Rules (WW Rules) and to allow for systems with a smaller footprint which would increase the number of approvable sites and reduce the system cost.

Bruce said that he has decided that further work on the partially completed mound sand study is not likely to be useful. He proposes to use the remaining $22k to evaluate changes to the mound sand specifications and proposals to allow for different materials in different areas of a mound sand. Less expensive material could be used for cover material and other areas not used to transmit the effluent into the native soil. Roger asked if mound systems are being used when the soil conditions do not require a mound system. In some cases, a mound is proposed to avoid the need for a replacement system. Overly conservative soil evaluations may also be used to avoid conflicts or delays in the permitting process. Craig H. said that a single mottle should not be the basis for a determination of the Seasonal High Water Table An examination of the entire test pit looking at all the evidence and a determination based on the elevation where there are multiple redoximorphic features should be used.

Suggestions to reduce construction costs include one that is not currently in the rules: allowing use of at-grade systems without requiring a replacement area; and two suggestions that are currently allowed by the rules: designing mounds where the distribution piping steps down in parallel with the slope of the native soil, and use of drip dispersal in mound systems.

Bruce said that the Lake Champlain Basin Project has issued a grant to the State for $225k. The money will be used for workforce development to encourage more people to become Licensed Designers and develop training materials for Licensed Designers and prospective licensed designers. The State will own the training materials so that they can be used and revised as needed.

Soil rejuvenation systems were discussed. Bruce said that current VTDEC policy is that the use of these systems is not regulated. The current policy is also that a proposal to use a rejuvenation system, by itself with no other remediation concepts, does not qualify as a best fix for a failed WW system. Gunner thinks use of a rejuvenation system is appropriate on a case-by-case basis. Jared said that some of the systems function by creating pathways through the soil by injecting air under pressure, He noted that an alternative to soil rejuvenation systems that inject air into a leachfield, that he has had success using, is some form of advanced treatment system

that improves the effluent quality, rather than trying to break down a biomat by injecting air into the leachfield. He said that there are several studies that have documented that improving the effluent quality can cure a failed leachfield by breaking down a biomat. Bruce said that he receives requests for in-the-septic-tank aeration systems but that the current WW Rules do not allow their use. There are concerns that rejuvenation systems allow the continued use of systems that do not have proper separation to the groundwater and that a better solution is installation of a replacement disposal system. Jared said that the system standards should not be reduced but that advanced treatment systems that improve the effluent quality should be allowed for remediation without requiring new distribution piping in the system.

Use of a general permit was also reviewed. Bruce said that this was part of the program to replace the current delegation process for municipalities that can be used for projects connected to both municipal water and wastewater systems. Bruce said that there is a perception that the review process slows down permit issuance, and that replacing VTDEC reviews with municipal reviews will speed up the process.

Bruce discussed possible changes that would allow him to focus on critical issues. He suggested that the TAC meet quarterly rather than monthly. This was accepted. Additional meetings can be scheduled if needed. As part of this change, Bruce suggested forming several small subcommittees that could work on a particular issue that would be submitted to the full TAC once the issue has been reviewed and final decisions are needed. This was also accepted. Bruce suggested subcommittees be formed to discuss soil loading rates, high strength wastewater, housing issues, I/A technologies, mound fill specifications, well siting and construction, and water system and water quality testing. Bruce will circulate a sign-up poll for those who wish to work on one or more of these topics. Bruce hopes to have a Regional Office staff member on each of the subcommittees. Bruce said that there will be no work on a WW Rule update in 2026 and that he will be pushing more decisions back to the Regional Offices so he can focus on central office work.

Bruce reviewed the process for completing the Annual Report to the Legislature. His staff will provide the performance numbers. Roger will work on the draft. Craig H., Tom, and Kevin agreed to help with proof reading. Bruce thinks there will be more interest in the work of the TAC in the Legislature this year. Roger suggested lining up some TAC members who can attend committee meetings. Craig H., Steve, and Gunner will help if available.

Bruce said that another appeal to the Environmental Court related to overshadowing has been decided. The plaintiff objected based on adverse impact on their land. The hearing ~~is~~ was conducted de novo, and the court upheld the Regional Office decision to issue a WW permit.

Meetings in 2026:

The TAC will meet in March, June, September, and December. The March meeting will be on March 17th. The other 2026 meetings have not been scheduled.