

**ANNUAL REPORT OF THE  
TECHNICAL ADVISORY COMMITTEE  
FOR 2014**

Established by Act 133 of the 2001 Adjourned Session

REGARDING OVERSIGHT AND IMPLEMENTATION OF THE

**WASTEWATER SYSTEM AND POTABLE WATER SUPPLY  
RULES**

**January 15, 2015**

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## **Annual Report of the Technical Advisory Committee**

### **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 2014.

### **Technical Advisory Committee Members:**

Members of the Technical Advisory Committee 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.

### **Executive Committee and Subcommittees:**

The TAC has an Executive Committee with three members and four alternates that are available to answer questions or provide testimony to the Agency or the Legislature. There were also 5 standing subcommittees during 2014. The subcommittees working on Underground Injection Control and High Strength Wastewater completed their work and were discontinued at the September meeting. The list of Subcommittees and members is included in Appendix A. In addition special subcommittees were appointed to address a specific topic such as review of a

particular advanced treatment system. The members of these subcommittees are included in the monthly minutes of the Technical Advisory Committee which are available online at <http://wastewater.vt.gov/wastewaterdisposaltac.htm> under the heading “Technical Advisory Committee.”

### **Meetings:**

Thirteen meetings were held by the TAC in 2014, on January 14, February 25, March 18, April 22, May 20, June 24, July 15, July 29, August 26, September 23, October 14, November 20, and December 16.

The meetings were held in conference rooms at the National Life Building in Montpelier. Meeting attendance ranged from 9 to 17 with an average attendance of 14 people.

The full minutes of each meeting are available on-line at <http://wastewater.vt.gov/wastewaterdisposaltac.htm> under the heading “Technical Advisory Committee.”

### **Activities of the Technical Advisory Committee (TAC):**

- 1. General Comments:** The Technical Advisory Committee and the Department of Environmental Conservation (DEC) continued to be very active during 2014. The DEC completed work on revisions to the Underground Injection Control (UIC) Rules and moved through the rule adoption process with the new rules becoming effective on October 29, 2014. The TAC also discussed high strength wastewater, Innovative/Alternative systems, compliance issues, design flows, isolation distances, soil descriptions, performance based designs, groundwater monitoring, overflowing wells, licensed designer requirements, water system design, bottomless sand filters, and permitting requirements for hydrofracturing of water wells.
- 2. Wastewater System and Potable Water Supply Rules (Rules):** Proposed revisions to the Rules were discussed at all 13 meetings of the TAC. The DEC proposes a major reorganizing of the Rules that brings information related to a topic, such as ground slope, together into one section instead of having it covered for each of the several types of systems such as mounds, inground, at-grade, etc. The new format also creates a way to cite each specific requirement separately from other requirements while the current Rules often use a paragraph format to discuss several requirements for a particular type of system. This is a large amount of work because each detail must be checked to be certain that it has been moved to the proper location, has been properly referenced in the index and in the footnotes, and that the required rewriting is clear and consistent. The DEC believes the new format will make application of the Rules easier for designers and regulators. In addition to the restructuring of the Rules, many of the requirements were discussed and were often modified. The individual topics will be covered in the following sections.

3. **High Strength Wastewater:** The TAC began working on this topic in 2013 with a small subcommittee. The subcommittee met several times and made some recommendations to the TAC including creation of a guidance document that could be used by designers and regulators when dealing with high strength wastewater. The draft guidance was discussed at the January meeting. At the February meeting the DEC discussed adding some language to the Rules to raise awareness of designers and regulators with some requirements for use when designing systems that may receive high strength wastewater. TAC recommendations included allowing systems that receive both high strength and low strength wastewater to be designed based on the combined wastewater strength rather than entirely based on the highest strength wastewater. The guidance document is posted on the DEC website at

<http://drinkingwater.vt.gov/poro/docs/highstrengthwwoutreachdoc.3.28.2014.pdf#zoom=100>

The TAC discussed the issue again at the October meeting and recommended to the Agency that only Class 1 (Professional Engineers) be permitted to design wastewater systems that dispose of high strength wastewater when the wastewater is to receive pretreatment prior to discharging to a soil-based wastewater system. Class B Designers would still be permitted to design a soil-based system to dispose of high strength wastewater when there is no pretreatment and the design uses the accepted formula for sizing such a system. At the December meeting the DEC discussed a draft worksheet that would be used to calculate leachfield sizes based on wastewater strength. The TAC felt that there are unresolved questions and recommended researching long term acceptance rates before adding any requirements to the Rules.

4. **Innovative/Alternative Systems:** The DEC was very active in the Innovative/Alternative (I/A) systems area during 2014. The DEC asked for TAC comments on the following systems:

AquaPoint – Bioclere Trickling Filter Treatment System

Presby Environmental Company - Simple Septic Alternative Leachfield Systems

Oakson – Septic Tank Effluent to Subsurface Drip Dispersal System

Delta – Ecopod Aerobic Treatment System

Bear Onsite Company – Septic Tank Effluent Filters

Vermont Department of Forest, Parks, & Recreation – Evapo-Transpiration Beds

Eljen Corporation – Mantis Alternative Leachfield System

Hydro Action Industries – Aerobic Treatment System

Anua Corporation – Peat Filter System and Aerobic Treatment System

Norweco Corporation – Hydro-Kinetic Aerobic Treatment System

AK Industries Corporation – Hydro-Action Aerobic Treatment System

An individual also asked about a gray water disposal system using bark mulch for the distribution and treatment of wastewater. Systems using this approach have been allowed in arid climates. The TAC raised concerns about longevity of the media and excessive biomat growth in the cold and humid Vermont climate and recommended that the applicant provide information about use of the system similar climates. A second individual asked about using a system that would heat the wastewater to evaporate it. The TAC asked about an energy budget, air quality, and pathogens. The proposal is the basis for expansion of an existing business and the TAC asked if this would be considered to be a pilot or experimental system and if there is a complying replacement system if the proposal does not function adequately.

The focus of TAC comments is on the functionality, durability, service access, energy costs, and maintenance requirements. The use of advanced treatment systems which allow for smaller leachfields and less separation to bedrock and the seasonal high water table is now well established in Vermont with several choices of equipment and many designers that are familiar with their use. The various advanced treatment systems and supporting devices are listed at:

<http://wastewater.vt.gov/wastewaterdisinnovativelist.htm>

A full listing of Innovative and Alternative Systems and Components reviewed by the DEC is provided in Appendix B.

5. **Compliance Initiatives:** The compliance initiative started in 2013 with one staff member splitting time between Regional Office permits and Drinking Water Permits. The position is now working full time on Regional Office Permits. One goal is to update the Regional Office Permit Tracking system. The Tracking System is no longer supported by IT staff and has not been upgraded for several years. Adding a compliance module to the existing data base is not an option. The current system is really 5 separate systems with one for each Regional Office. Assembling statewide data using the auto reports currently available requires searching 5 data bases and then combining the results. Under the existing system a regional office does not have direct access to data from another regional office. The update that is currently underway, though proceeding more slowly than

expected, will combine all of the data into one system that program management can easily query for either statewide results or on an office-by-office basis. In addition, the update will promote consistent data entry and uniform permit conditions. Consistent permit conditions will ensure that service providers who perform maintenance inspections understand what is required and how to document their work in a consistent manner.

The Tracking System upgrade will include a Compliance Tracking Module that the current system does not have. The Compliance Module will allow Regional Office Staff to: create Compliance Schedules with permit required activity and due dates; document when records are received; update current owner information using the Department of Taxes data base; and identify systems that are out of compliance with permit required activities.

In conjunction with this effort, the Compliance Section has developed and is continuing to develop, forms that must be used for reporting the required data along with educational handouts for service providers and system owners. The Compliance Section is also working towards a system based on the SPAN numbering system used by the Vermont Tax Department. Once a Span Number is assigned it remains with the specific parcel which overcomes a current limitation of parcels tracked by the owner's name that cannot be tracked once the parcel is sold. The current tracking system does not have current landowner information for many properties making compliance outreach efforts difficult.

Vendor approved Service Providers of I/A Systems have assisted the Compliance Section by submitting reports, using a coversheet with the field reports that was developed with their assistance and researching permit numbers using the on-line search tool. Regional Office Staff have reported a noticeable increase in the number of reports being submitted. Compliance Outreach information is included in Appendix B. The DEC is asking that all inspection reports for I/A Systems, including those for systems that did not require a DEC permit for their installation, be submitted to the Regional Offices. This will allow the State to monitor issues that may arise with older systems that may not have a DEC Permit. The service providers are also asked to provide the permit number for each system that they inspect. If the number is unknown, the Regional Office staff will attempt to identify the permit number which can then be shared with the service provider for future use. Associating Inspection Reports with permit numbers allows for the appropriate filing and tracking of documents. Documents are now being filed as separate files in a Compliance folder using a common naming protocol.

Educational outreach efforts in 2014 included: embracing EPA's Septic Smart week; participating in Municipal Day 2014; developing an outreach brochure with Septic Smart tips; and developing an information sheet to help educate homeowners on the importance of having Installation Certifications and reports submitted. All I/A Systems permitted in 2014 either received the Installation Certification handout by mail (234) or as an enclosure when the Permit was mailed.

The second annual meeting with service providers was held in December and was well received. The service providers are very supportive of having an effective tracking system and strong follow-up by the DEC. They provided several suggestions on ways to make the process more efficient such as being flexible on the dates for the required periodic inspections. If a geographically compact group of systems can be inspected at the same time there is a significant reduction in travel time and cost. The service providers support the use of a common inspection and reporting form for a given technology as this ensures that all of the service providers will provide the required minimum level of work and compete on a level playing field. Some Service Providers also question why the State needs copies of Service Maintenance Contracts which they see as private contracts that contains client information they may not want to share. They support the use of simple affidavit that can be signed by the client and submitted to the State as contract verification. In addition, the service providers have provided valuable insight into system installation issues and performance issues. It was noted that there have been systems with freezing problems and they offered suggestions for dealing with the problem including better drain back designs and possible adding heat tape to the manifold risers during the initial installation. The heat tape would only be activated if a problem occurred.

6. **Design Flows:** Design flows for residential buildings were discussed at several meetings. One issue is the use of metered flows and DEC supports using metered flows only for projects without specified flows in the Rules and as information for solving failed system problems.

In addition, the DEC presented information at several meetings about whether the per person design flow for residential buildings should be maintained at the current 70 gallons/day/person or reduced to 60 gallons/person/day. The literature indicates that when a large number of units are grouped together the average flow rate would support a change to 60 gallons/day/person while a review on a unit by unit basis finds large variations with a significant number using more than 70 gallons/per/person. After an extensive review, and in consideration of concerns about the long term acceptance rate of the leachfield/soil interface, the DEC decided to maintain the existing design flow rates until more work is completed on the long term acceptance rate. The Rules continue to allow for flow reductions per housing unit when five or more units discharge to the same wastewater disposal system.

The DEC also reviewed the existing design flows for campgrounds. The existing rules differentiate between campgrounds open for 7 months or more per year from those open for a shorter period of time. The Department reviewed information from Federal campground operations and will consult with the Vermont Campground Owner's Association about operations in Vermont. The DEC would like to have design flows that are not dependent on the length of operation per year but will have to determine if such a change is practical.



- 7. Isolation Distances:** The TAC discussed the separation distances between leachfields and water sources. The group agreed that there are situations when the type and thickness of soil provides sufficient protection of the water source that the separation distance can be reduced. The Rules will include a process for making these reductions. The Rules will also allow for a reduction in isolation distance when other geologic conditions justify the reduction. A well that has a water level under pumping conditions which is at a higher elevation than the leachfield is one example when a reduction could be granted. Also discussed were the methods used in some states where the isolation distance is measured from the leachfield to the bottom of the well casing (sometimes known as the Colorado method). Under this approach, casing a well deeper than normal can be used to provide the required isolation distance. The TAC discussed this approach and because of how water flows under gravity does not agree that a vertical separation is automatically equivalent to a horizontal separation of the same distance. The existing Rules require an evaluation of potential interference between wells located closer than 500 feet when the wells have a design yield of more than 2 gallons per minutes and less than 5 gallons per minute. The TAC recommended that wells with design yields of less than 2 gallons per minute only require evaluation when the separation distance is 100 feet or less. The TAC further recommended a reduction from the existing 500 feet to 300 feet reasoning that a jump from 100 feet to 500 feet is too large in relation to the increase in design yield.
- 8. Soil Description Methods:** The TAC briefly discussed the requirements for soil descriptions in the current Rules. The group considered whether the Rules should require use of United States Department of Agriculture (USDA) soil description methods. These methods are scientifically based, well described, and complete. Use of these methods would standardize the information included with permit applications. Implementation of the USDA methods would require significant work by the DEC as training would be required for many designers. One benefit from making the change would be that designers could choose to use soil evaluation techniques in lieu of the percolation test. The designers would save time and many in the design and regulatory community believe that carefully done soil evaluations will be a more accurate basis for septic design than a few percolation tests. The DEC is working to decide if it will be possible to implement the USDA approach in the current Rule revision process.
- 9. Performance Based Designs:** The performance based design approach was first included in the 2002 Rules. This approach allows for development on sites with as little as 18" to bedrock and there is no minimum depth to the seasonal high water table (SHWT) as long as there is a hydrogeologic evaluation that shows the wastewater will remain at least 6" below the ground surface at all times of the year. When this approach was included in the Rules in 2002, it was considered to be a very aggressive reduction in the minimum site conditions and it was decided that use of this approach should be carefully monitored. The permits that were issued for these systems required a springtime inspection for the first three years of operation. After 12 years there are no reports of

failed systems that are related to the reduction in design standards and the TAC recommends that the inspection requirement no longer be included in any permit. In addition, the Rules should be amended to waive the requirement for any of the previously issued permits.

10. **Groundwater Level Monitoring:** The existing process for evaluating the groundwater level using springtime monitoring has been part of the Rules since 2002. The existing process works well for system using the prescriptive design approach but not as well for performance based designs. The TAC discussed revisions to the process at several meetings during 2014 and with the help of a reconstituted subcommittee the DEC proposed an updated process. One major point of concern is whether or not a site with several groundwater monitor wells should be evaluated using the results of the most restrictive monitor well. It was recommended that, just as with hydrogeologic evaluations, there should be a process that could be used by those who are not qualified hydrogeologists based on the most restrictive monitor well, while qualified hydrogeologists could use a process that balances the flow across an area containing several monitor wells. It was also recommended that all monitor well readings be made by a licensed designer or hydrogeologist rather than allowing the landowner or other non-licensed people to take the readings. The TAC also agreed to change the frequency for taking groundwater readings. The current Rules require readings every 7 days unless the groundwater level rises above a certain elevation when the reading must be taken every 4 days. The TAC supported a change to taking all reading every 5 days.
11. **Overflowing Wells:** The issue of overflowing wells has been discussed at the TAC for at least two years. The Annual Report for 2013 included the TAC recommendation:
  - A. that wells should be controlled to prevent discharges of more than 10 gallons per minute, and
  - B. because the decision to apply special well drilling methods to enable control of the overflow is very site specific it should be left to the well driller and the well owner to decide. The well driller should inform the well owner about their responsibility to control the well flow and the options and the associated costs they have prior to commencing drilling.

and noted that there is a public trust issue that the DEC must consider and include in the Rules.

During 2014 the TAC revisited the issue. This additional discussion helped develop a fuller understanding of the issues related to overflowing wells. Wells that overflow might in some circumstances deplete the aquifer, cause erosion of the surrounding ground, and/or cause flooding issues. Closing in wells might create negative effects including uncontrollable water flows springing up in the general area of the sealed well, possibly in basements or in roadways.

The cost of implementing well construction measures to prevent or control the overflow from wells was also revisited. The large majority of wells do not overflow, and of those that do, many overflow only seasonally and/or at low rates. While there are areas where overflowing wells are more common there is no method that can be used to predict if a particular well will or will not overflow. There are methods that could be applied to the construction of all wells that would reduce the cost of controlling a well and there are methods that can be applied to a well after the well is drilled. The first approach would add a significant cost to every well, even though only a small percentage overflows in a significant way. After the fact methods are often very expensive if the pressure in the well is high.

With a more complete understanding of the issues the TAC discussed concepts of regulating based on the amount of overflow, or based on how high the pressure in a closed well should be, or by use of a reporting/notification process without reaching a definitive answer. In addition, the potential for the beneficial use of the overflow and the adverse impact, if any, might be factors in any decision on whether or not the overflow must be controlled. However, before any other decisions can be made, the public trust issue must be resolved.

Given the new information on overflowing wells that the TAC considered in 2014 on this topic, the TAC did not reach any final recommendations to the DEC regarding regulation of existing or future overflowing wells. This topic will certainly be on the TAC's agenda for early 2015.

- 12. Water Supply Issues:** Under the current Rules all of the technical standards for the design and regulation of water supplies are included as chapters in the Water Supply Rules which are administered by the Drinking Water Section. The draft Rules under consideration will create a new chapter within the Rules that will include all of the information needed to design and regulate non-public water systems. The Drinking Water Section has worked closely on this new section because some projects start with a non-public water system then grow in size or otherwise change their operation such that they become regulated as a public water system. This coordination is intended to make the requirements for a transition from non-public to public as clear as possible so that a landowner can anticipate and plan for any future changes. This coordination will also help the Licensed Well Drillers, who work on both public and non-public systems, by standardizing as many requirements as possible. The TAC has continued to review and comment on the water supply requirements to ensure clear and consistent language is used.
- 13. Bottomless Sand Filters:** Bottomless sand filters, which are essentially mound systems that have the sand side-slopes replaced by retaining walls lined with impermeable materials, were discussed at several meetings. Bottomless sand filters have been

permitted as “best fix” replacement systems for many years in Vermont when very small lots or the separation distances to surface water or to drinking water sources are too limited for conventional mound systems. The TAC supports the DEC proposal to allow use of these systems for new projects as well as replacement systems. There are concerns about freezing in the winter and the durability of the retaining walls and the impermeable liners but the TAC believes these issues can be controlled with proper design factors. The TAC supports allowing these systems for disposal of both septic tank effluent and for the effluent from advanced treatment systems (filtrate) using different applications rates. After some discussion, the TAC agreed that systems that receive filtrate are unlikely to fail and therefore a replacement area as a backup should not be required.

## APPENDIX A

### Technical Advisory Committee Members as of December 1, 2014

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Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel



**Subcommittees:**

**Hydrogeology**

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**UIC Rules**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Scott Stewart, Rodney Pingree, Kim Greenwood, Cindy Parks, John Beauchamp, Gail Center

**Wastewater Strength**

Mary Clark, Cindy Parks, Peter Boemig, Bill Zabiloski, Roger Thompson, John Akielaszek,

**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

## Appendix B

Innovative/Alternative Systems and Components Reviewed in 2014					
	Model Name	Date Received	Status	Type of Approval	Date Approved
Aquapoint.2,LLC	Bioclere	6/1/2013	Approved Renewal	General Use	3/20/2014
Bio-Microbics, Inc.	High Strength Fast	12/12/2014	Approved New Model	General Use	12/19/2014
Premier Tech Environmental	Ecoflo	4/18/2013	Approved New Tank Model	General Use	8/14/2014
Norweco	Hydro Kinetic	8/13/2013	Pending – Drafting Pilot Approval	Pilot Approval	
Anua	Puraflo Peat & Platinum	10/21/2013	Pending	General Use	
Septio Tech/ BioMicrobics	SeptiTech	12/3/2013	Approved New Model	General Use	7/22/2014
Advanced Onsite Solutions, L.L.C.	The Clean Solution	2/27/2014	Approved New Models	General Use	3/20/2014
Advanced Aeration	Vacuum Bubble Technology Aerator	5/13/2014	Approved for Specific Installation	Pilot Approval	6/16/2014
Infiltrator Systems Inc.	ARC and BioDiffuser Chambers		Approved New Models	General Use	9/23/2014
Presby Environmental, Inc.	Simple Septic Pipe Leaching System		Approved New Models	General Use	8/1/2014
Oakson, Inc.	Drip Distribution with Septic Tank Effluent				

Bear Onsite, L.L.C.	Effluent Filters		Approved	General Use	9/22/2014
Infiltrator Systems, Inc.	Septic and Pump Tanks		Approved	General Use	3/14/2014
Delta Environmental	Ecopod		Pending	General Use	
VT State Parks	Evapo-transpiration Bed		Pending	Experimental	
Fuji Clean, USA	Fuji Clean	12/22/2014	Pending	General or Pilot Use	
Jean Gerber, Landowner	Bark Mulch Basin Greywater System		Pending	Experimental	
AK Industries	Hydro-Action		Pending	General Use	
EcoSolutions	Custom MMBR		Approved	Experimental	
Jolley Associates	ENCON Evaporator	3/31/2014	Pre-Application		

## Performance Standards for Regional Office Permits

### Performance Standards for Permits Issued During 2007-2014

	# of Permits Issued	# of Permits Meeting PEP Standards	% of Permits Meeting PEP Standards	Average DEC Days	Average Total Days	# of Permits That Exceeded Standards
2007	3746	3691	98.5%	16.8	48.2	55
2008	3435	3418	99.5%	12.3	62.1	17
2009	2691	2672	99.3%	11.8	41.6	19
2010	2621	2600	99.2%	11.9	35.2	21
2011	2289	2279	99.6%	13.2	29.8	10
2012	2472	2444	98.9%	12.7	29.6	28
2013	2449	2400	98.0%	14.0	28	49
2014	2503	2417	98.4%	12.6	29.6	45

Note: The performance standard for DEC days is 30 days for one-lot subdivisions and projects with a design flow of 500 GPD or less. The performance standard for other projects is 45 days.

### Permit Information for 2014

<b>Regional Office</b>	<b>Permits Issued to Repair Failed Wastewater Systems</b>	<b>Permits Issued for Innovative/Alternative Wastewater Systems</b>	<b>Applications Denied</b>
<b>Barre</b>	99	153	0
<b>Essex</b>	113	108	4
<b>Rutland</b>	89	73	2
<b>St. Johnsbury</b>	61	39	1
<b>Springfield</b>	112	221	1
<b>Total</b>	474	594	10

Reasons for denials:

Seven of the eight denials were issued for applications that were incomplete when submitted. In each case the Agency made at least two requests for additional information without any response. Of the seven denials, six were held pending for over one year to allow time to respond. The applications were therefore denied because the information originally submitted failed to demonstrate compliance with the rules. The eighth denial was for a project that proposed to use an Innovative/Alternative Technology not approved for use in Vermont. The Agency offered to review an application to approve the technology but the applicant decided not to apply.

### Licensed Designer Program Education Opportunities

	<b>DEC Sponsored Classes</b>	<b>Licensed Designers Trained</b>
<b>2010</b>	5	120
<b>2011</b>	4	110
<b>2012</b>	7	215*
<b>2013</b>	12	273*
<b>2014</b>	12	

\* DEC co-sponsored with the Vermont Technical College and the University of Rhode Island courses in:

- “Innovative/Alternative Technologies” and “Bottomless Sand Filters” in 2012; and
- “Pumps and Pump Controls” and Identifying and Managing High Strength Wastewater” in 2013.

## Low Income Loan Program

2014 was the first year that the Low Income Loan Program became fully operational following an agreement with the Opportunities Credit Union (OCU) to become the Program's contracted lender. Approximately \$102,000 of loans for six projects was awarded in calendar year 2014. Two of the loans were awarded in state fiscal year 2014 and four were awarded in state fiscal year 2015. Two loan applications were rejected by OCU; one due to income eligibility; the other due to being in foreclosure proceedings. To date, all individuals who received loans are repaying the loans on time.

There is an anticipation that there will be an increase in requests for loans during calendar year 2015 now that the program is fully operational and outreach efforts are reaching the desired audience.

### Innovative/Alternative (I/A) Wastewater System Summary

Year	Number of I/A Systems Permitted*	Number of I/A Systems Requiring Inspection Reports/Year	Total Number of I/A Systems Requiring Inspection Reports**	Number of Inspection Reports Received and Tracked***	Percent of Reports Received and Tracked
2007	137	45	57	0	
2008	796	318	363	0	
2009	538	171	534	0	
2010	457	158	692	0	
2011	424	155	847	0	
2012	513	176	1023	52	5
2013	521	217	1240	472	38
2014	612	217	1457	457	31
<b>Total</b>	<b>3998</b>	<b>1457</b>		<b>981</b>	

Footnotes:

\* Values reflect systems that were logged into the tracking system and includes all I/A systems including alternative leachfield products but excludes replacement areas.

\*\* Systems may not be installed

\*\*\* Reports for systems installed prior to 2007 are included

2014 values are not final. Not all of the reports for 2014 have been received as of 1/1/2015

Appendix C

Technical Advisory Committee Minutes for 2014

**Approved Minutes of the Technical Advisory Committee Meeting  
January 14, 2014**

**Attendees:** Roger Thompson Denise Johnson-Terk  
Mary Clark Scott Stewart  
Gail Center Steve Revell  
Craig Heindel Bill Zabiloski  
Carl Fuller Peter Boemig  
Claude Chevalier Ken White  
John Beauchamp Ernie Christianson  
Gunner McCain Mark Bannon  
Anne Whiteley

**Scheduled meetings:**

February 25, 2014 1-4 PM Winooski Con. Rm., National Life – Montpelier  
March 18, 2014 1-4 PM Winooski Con. Rm., National Life – Montpelier

**Agenda:**

Accepted

**Minutes:**

The minutes of the December 13, 2013 meeting were circulated by e-mail by e-mail prior to the meeting for comments. There were no additional comments.

### **Annual Report of the TAC:**

The draft annual report was circulated by e-mail prior to the meeting and the editorial comments that were received were included in the most recent draft. There were no additional comments. Roger and Ernie will deal with the finishing touches of putting the published date on the document and getting copies made and circulated to everyone. The report will also be published on the Regional Office page of the Agency website.

### **High Strength Wastewater:**

Mary reviewed the document that she had circulated by e-mail prior to the meeting. John Akeilaszek and Cindy Parks of the Indirect Discharge Program also commented. Steve said that the document was well conceived and well written. He recommended that the document be adopted by the Agency as guidance. Ernie asked if there is agreement to keep this as guidance. Steve said yes as putting it into the Wastewater System and Potable Water Supply Rules (Rules) would be a lengthy process. Peter said that the Rules should include a section that would require attention to the issue of high strength wastewater. Mary noted that there are some national standards defining high strength wastewater that could be included in revision of the Rules. Ernie said that there might be a section in the Rules referring designers to guidance so that the details of how to deal with high strength wastewater would not get locked into the Rules. There was discussion of how to link high strength wastewater with treatment systems approved under the Innovative/Alternative (I/A) portion of the Rules. Roger said this may be one more reason to support the request by Craig and others to come up with a better name than Innovative/Alternative systems.

Mary asked if the group supported going forward with publishing the document on High Strength Wastewater. The group strongly supported use of the document.

### **Legislative Issues:**

Anne discussed S.211 which deals with the use of holding tanks. The current Rules allow use of holding tanks in limited situations for certain public buildings, such as town halls and libraries, when the buildings are owned by a municipality or the state. S.211 proposes to include buildings with similar uses and situations that are not owned by a municipality or by the state. There are several locations with existing small churches, libraries, and similar uses where the use of the building is infrequent and by a limited number of people and the installation of conventional water and wastewater systems is either impossible or extremely expensive.

Anne also reviewed S.182 which would require that an applicant own or control by easement or other legal means all of the land needed to provide the required isolation distances to water or wastewater systems. This would apply to replacement systems as well as to systems for new



projects. The impact of this would be widespread as many of the currently issued permits would not comply.

H.3, which was introduced a year ago, would repeal all of the requirements to notify neighboring landowners when an isolation distance extends onto neighboring property. There has been no action on this bill to date.

Anne said that there are legal cases ongoing related to the impact that isolation distances have on neighboring properties. Eventually there will be one or more court decisions that determine if the Agency can issue permits that include isolation distances that extend onto neighboring properties.

### **Draft Wastewater Rules:**

Ken asked if Subchapters 6 and 11 are finished. Ernie said that Subchapter 11 is pretty close.

Ernie reviewed the latest draft of Subchapter 8 (01-07-2014). One issue is when in the process must legal easements be obtained for systems that will not be on land owned by the applicant. Gunner said that getting an easement before the permit is issued can be a problem. In some cases the project does not go forward and any money spent to buy an easement would be lost. Peter suggested that the state issue an approval letter that indicates the permit will be issued once the easement has been obtained. This would allow the applicant to be assured that the permit qualifies for a permit while not having a permit that is issued without assurance that the off-lot system can be constructed.

Gunner asked about the practice of installing charcoal filters in plumbing vent pipes above the building roof. He said that he has used this approach but has been told that installing a filter is a violation of the plumbing code. This approach has been used in situations where there is an objectionable odor from the roof vent as well as for vents from pump stations and other portions of a wastewater system. The concern about installing a filter is that it might freeze over from the moisture in the air in the vent pipe which would keep the vent from serving its intended purpose of allowing air into the piping system to prevent any siphoning of plumbing traps.

Mary asked if existing section 1-805 (minimum site conditions) should be retained in section 8. Anne said that it should be in section 9.

Ernie discussed the section on metered flows. He said that in the current rules metered flows can be used to change the design flows given in the Rules, for facilities with no design flow in the table, and for replacement systems that do not have room for full compliance. He would like to limit the use of metered flows to only facilities without a specified design flow or for replacement systems.

Roger suggested keeping the existing language related to waivers for water and wastewater systems (1-802 and 1-803 of the current Rules). Ernie said he was trying to simplify by putting the sections together. Some rewording is needed if the proposed version is used and Ernie will look at this.

In addition the group commented on various sections where the wording can be clarified. The group noted that this is a much improved draft and getting close to being ready to start the adoption process.

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**Executive Committee:** Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

**Subcommittees:**

**Hydrogeology**

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson, Spencer Harris

**UIC Rules**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Scott Stewart, Rodney Pingree, Kim Greenwood, Cindy Parks, John Beauchamp, Gail Center

**Wastewater Strength**

Mary Clark, Cindy Parks, Peter Boemig, Bill Zabiloski, Roger Thompson, John Akielaszek,

**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

**Approved Minutes of the Technical Advisory Committee Meeting**

**February 25, 2014**

**Attendees:** Roger Thompson  
Chris Russo  
Mark Bannon  
Ernie Christianson  
Gail Center  
Rich Wilson  
Claude Chevalier  
Craig Heindel  
Anne Whiteley  
Gunner McCain  
Bill Zabiloski  
Mary Clark  
Jay Buermann  
Jessanne Wyman  
Ken White  
Justin Willis  
Peter Boemig

**Scheduled meetings:**

March 18, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier
April 22, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier
May 20, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier
June 17, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier

**Agenda:**

Accepted

**Minutes:**

The minutes of the January 14, 2014 meeting were accepted as drafted.

### **Legislative Update:**

Ernie reviewed the various bills under consideration. H.479 deals with the beneficial use of gray water. There is interest in surface application of gray water for irrigation purposes; however federal regulation prohibits surface application of water with human pathogens. Gail asked about farms using urine as fertilizer. Ernie said that the urine is heated to destroy any pathogens prior to land application. One bill proposes to encourage “downtown” development by reducing permit requirements, including allowing for prescriptive approval of applications that are certified by the Licensed Designer. There is no action at the moment on H.857 which would allow for a change in use of a building which potentially would increase the design flows of the water and/or wastewater systems based on a claim by the building owner that the systems are adequate for the proposed increase. There is also no action on H.182 which proposes that any isolation distances required under the Wastewater System and Potable Water Rules be on property that is either owned or that is subject to legal easements which allow the isolation distances to extend onto other properties. S.211, which proposes to allow more buildings to use holding tank systems, is under discussion. The Senate Committee intends to rewrite portions of the bill and the Agency will again comment once the new language is available.

Ernie also reported that he had contacted the New Hampshire Department of Environmental Services and asked if they have any concerns about adopting rules that allow drilled and shallow wells located 75’ from wastewater disposal systems. Wells constructed less than 75’ from wastewater disposal systems must be grouted. They said they did not have regrets but did not make the decision. Ernie plans to contact the people who did make the decision.

### **Innovative/Alternative Systems:**

Mary said that she and a subcommittee of TAC and Regional Office members had just met with representatives of Oakson Inc. about using a drip dispersal system without requiring pretreatment of the effluent to the filtrate standards of no more than 30 mg/l of BOD and 30 mg/l of TSS. The Oakson system relies on a series of filters that can be backwashed that protect the drip dispersal system from clogging. There is a significant track record of successful operation of the system in other states. Mary will follow up with the subcommittee members on the next steps.

Mary said that she has scheduled another group to meet with representatives of the Eljen Company in March and has scheduled a meeting about the Simple Septic system with representatives of the Presby Environmental Company before the April TAC meeting.

Mary also discussed an ongoing request for approval of effluent filters. Bear Onsite Company has a line of filters, some of which have been reviewed and approved by NSF. There is some discussion over what is required regarding testing for approval in Vermont and it would be good to have a clear statement of the process or allowed methods.

The Agency also provided a handout of discussion points on I/A Operation and Maintenance Inspections. The Agency proposes to allow people who are not licensed designers, but who are approved by the vendor of the specific system, to also do the ongoing maintenance and operational inspections after the initial installation has been completed and certified by a licensed designer. This will increase the number of people available to do the inspections and allow a group of people who specialize in operation and maintenance work to provide this service.

**Next Meeting Dates:**

The group agreed to meet on April 22<sup>nd</sup>, May 20<sup>th</sup>, and June 17<sup>th</sup>.

**Wastewater System and Potable Water Supply Rule Revisions (Subchapter 9):**

Ernie reviewed the draft of the rules that had been circulated by e-mail. The draft is a complete rewrite of the rules and while it incorporates a great deal of material from the existing rules it also pulls material into Subchapter 9 from other subchapters and moves some material out to other subchapters. Sorting all of this out will take some time to make certain that the pieces work together.

Among the proposed changes:

A replacement system can be permitted at any time and then constructed at some future time without further review.

Some language will be added related to wastewater strength. Mark and Craig suggested that a list of generators of low and moderate strength waste be created. Jay suggested guidance that allows for projects that mix residential uses with low strength waste and other uses with moderate and high strength waste. It should be possible to calculate the strength of the combined wastewater rather than just design a system for the total design flow at the highest strength.

Soil descriptions should include more detail descriptions using the USDA methods. There was discussion if this should be required rather than suggested. These are methods that would be required if the percolation test approach is replaced with a soil identification approach. Licensed Designers will need to have these skills in order to make the switch. There was also discussion about whether the focus should be on “redoximorphic” indicators rather than mottles. Any description needs to cover both but the ones that determine how the rules actually apply are the “redoximorphic” indicators.

The language about flood areas was discussed. Mark thinks that the references may not be appropriate. Ernie and Anne said the descriptions are federal language and related to flood insurance but will double check to make sure they are correct.

The TAC discussed the existing requirement that all systems designed using the performance based approach must be inspected in the springtime for three years. This was a statutory requirement for a few years after the performance based approach was approved by the legislature. That requirement has now expired. The TAC said that the approach has now been in use for several years without any evidence of failures of systems using this design approach and therefore the group supports discontinuing the inspection requirement.

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**Executive Committee:** Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

**Subcommittees:**

**Hydrogeology**

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson, Spencer Harris

**UIC Rules**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Scott Stewart, Rodney Pingree, Kim Greenwood, Cindy Parks, John Beauchamp, Gail Center

**Wastewater Strength**

Mary Clark, Cindy Parks, Peter Boemig, Bill Zabiloski, Roger Thompson, John Akielaszek,

**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark



Mary also reported that a different subcommittee had just met with an Eljen Company representative to discuss their request for approval of the Mantis system. This system uses a series of plastic modules with small fabric wrapped units that are bedded in select sand. The plastic modules are connected with rigid plastic pipe. Effluent flows along the pipe and into the fabric wrapped units and then into the surrounding sand before infiltrating into the native soil. The request for approval asks for 50% reduction in sizing based on the testing that was recently completed by the Massachusetts Test Center. The subcommittee has a few follow-up questions that Mary will send to the Eljen Company.

Mary said that a meeting has been scheduled for next month to discuss the request for approval of the Presby Simple Septic System.

Mary also updated the TAC on changes that will allow some of the required inspection and maintenance work for Innovative/Alternative systems to be performed by people who are not Licensed Designers. She is updating the existing approval letters so that all of the systems can use the new approach. Ernie said that the Agency will issue an estoppel letter that will cover people with existing permits on Monday. The new permit template is already in use by the Regional Offices.

#### **Underground Injection Control Rules:**

Cindy Parks has circulated a copy of the UIC Rules that have now started the formal rule adoption process. The TAC has reviewed draft versions of the rules several times. Roger asked if the TAC wanted to review the draft that has been submitted for the adoption process and the group decided they did not.

#### **Wastewater Rules:**

The TAC recommended removal of the section for enhanced prescriptive designs. None of the designers or regulators present remembers using this section since the performance based design approach was added to the rules.

There was discussion about the isolation distance between a wastewater disposal system and a water source. It was recommended that the revised rules state that the measurement is from the minimum required effective basal area.

The distance required between leachfields related to concerns about induced groundwater mounding was discussed. Craig said that based on his work the induced groundwater mounding dissipates quickly and Steve agreed. The recommendation is that systems with linear loading rates of 10 gal/day/linear ft. or less are not a concern when located at least 25' apart. Situations with higher loading rates or less separation should have a hydrogeologic evaluation.



The groundwater monitoring requirements were also reviewed. Craig and Steve said that requiring the performance based design approach to use the single highest result from a groundwater monitoring well is too restrictive. A subcommittee worked on this issue in 2011 and 2012 without reaching any consensus. It was decided to have an updated subcommittee look into this issue. Thom Villars, Brian Trembeck, Chris Tomberg, Steve Rebillard, and Fred Magdoff were mentioned as potential new members of the subcommittee.

John said that he has recently seen wells with water leaking out around the well cap. This indicates artesian pressure. John asked if this suggests there is any risk of contamination of the well. As long as the water is flowing out there is no risk. The overflow does not indicate that any water is leaking into the well through the casing or down around the outside of the casing. As long as the well cap is above any surface water and any casing penetrations such as the pitless adapter are not leaking, the well overflow does not suggest any risk of contamination.

Ernie noted that he proposes to increase the isolation between road ditches and upslope leachfields to 75'. Craig asked why this distance should be more than the 50' to surface water. Ernie responded with the concern that if wastewater flowing through the ground intersects with the ditch the effluent may just pond on the ground surface while it would be diluted if it reached surface water. The distance would only need to be 75' if the seasonal high water table (SHWT) would be above the bottom of the ditch. There was concern among TAC members about whether this would increase the amount of soil testing needed to decide if the seasonal high water table would be above or below the bottom of the ditch. Gunner suggested using the test pit required for the leachfield that would be closest to the ditch as the default value.

The TAC supported using the bottom elevation of a drip dispersal line when determining separation to SHWT or bedrock.

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**Executive Committee:** Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

**Subcommittees:**

**Hydrogeology**

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson, Spencer Harris

**UIC Rules**

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**Wastewater Strength**

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**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

**Approved Minutes of the Technical Advisory Committee Meeting**

**April 22, 2014**

<b>Attendees:</b>	Roger Thompson	Craig Heindel
	Ken White	Terry Shearer
	Steve Revell	Bill Zabiloski
	Justin Willis	Spencer Harris
	Scott Stewart	Gunner McCain
	Chris Russo	Mary Clark
	Denise Johnson-Terk	Peter Boemig
	Claude Chevalier	Mark Bannon
	Ernie Christianson	

**Scheduled meetings:**

May 20, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier
June 24, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier

**Agenda:**

Deleted UIC discussion

**Minutes:**

The minutes of the March 18, 2014 meeting were accepted with an addition that the reference isolation distances were for mound type wastewater systems.

**Legislative Update:**

Ernie reviewed S.211, a bill that expands the use of holding tanks to some buildings owned by charitable, religious, and non-profit organizations. The bill passed the Senate and is under review by the House. It is being revised to add a requirement for a performance bond with at least 20 years of coverage. The bill would apply to both new and existing buildings. The building could continue to use the holding tank even if eventually converted to use by an organization not covered by the exemption that allows for use of a holding tank.

Ernie also discussed H.857 which reduces permitting requirements for a change in use of a residential building when the owner of the water and wastewater systems certifies that the systems have adequate capacity. The Agency does not support H.857.

Ernie gave an update on the shoreland regulation bills. A bill (H.526) is moving forward and as currently drafted will have a conditional exemption for water and wastewater systems. The condition is that the Regional Office Programs will consult with and take into consideration the concerns of the Watershed Management Division when issuing water and wastewater permits.

**Innovative/Alternative Systems:**

Mary provided an update on several systems.

A TAC subcommittee and Agency staff met with Mr. Presby and others to discuss his application for the Simple Septic pipe leaching system. Mary will follow up with the subcommittee regarding the next steps.

Also under consideration is the Hydro- Action system which has NSF 40 approval. This is an aerobic treatment system.

Mary sent a follow-up information request to Eljen on their Mantis system after the subcommittee meeting with the company.

The Agency is also reviewing a request for a gray water disposal system that uses bark mulch for the distribution and treatment of the wastewater. The request is based on use of a systems of this type in arid climates. The TAC offered opinions and concerns with the proposal due to the potential for composting, longevity of media, and potential for biomat growth and ponding

within the media. The applicant will need to provide additional information related to use in Vermont as there are concerns that the mulch media will be saturated and may not function well in a wetter and colder climate.

There is a request to approve use of the Anua (formerly Puraflo) Peat Filter where the modules are installed in an open bottom container that will discharge into the soil (one unit per bedroom). The current approach requires the effluent to be collected from the bottom of the filter enclosure and then discharged to a filtrate disposal system. The primary review issue is the limitation in the Wastewater System and Potable Water Supply Rules that limits the application of filtrate to no more than double the application rate of septic tank effluent. Roger reviewed the history of this requirement which is based on concerns that very high application rates may wash viruses down into the seasonal water table where they might travel long distances. It would be good to look at the current science to see if these concerns have been addressed. Roger noted that this concern is also the basis for requiring that all filtrate disposal systems use pressure distribution. The group discussed the requirement for pressure distribution and learned that some designers have proposed and received approval for filtrate systems using inground trench systems without pressure distribution.

Mary also discussed an application to use an evaporation system that would allow for an increase in design flow for an existing convenience store. The group discussed this and asked if an energy budget had been established as evaporation is energy intensive. The applicant had not submitted any information about energy used. The group also asked about air quality concerns and pathogens. This may depend on the temperature of system as high temperature incinerating toilets have been used without reports of air quality issues and the high temperatures would deal with any pathogens. There was discussion of how this approval might fit within the rules as experimental and pilot systems require that a fully complying replacement area be available in case the new technology does not work.

### **High Strength Wastewater Outreach Document:**

Mary mentioned that the High Strength Wastewater Considerations document had been posted to the Agency website at:

<http://drinkingwater.vt.gov/poregionaloffices.htm>

Three other outreach documents related to commercial kitchens, restaurants, and all users are also posted under “What’s New”. Thanks to all subcommittee members for researching and drafting this document.

### **Compliance Update:**

Chris Russo who had been splitting time with the Drinking Water Section is now working full time on the Regional Office permits. Another person will pick up the work for the Drinking Water Section.

Chris said that the annual reports from the vendors of I/A systems that are due in April are being submitted. 70% were submitted on time and she is working on getting the remainder of the reports.

The annual inspection reports for the individual systems are coming in better than in the past. These do create extra work for the Regional Office Staff. Chris said that the new computer tracking system will help reduce the workload. The new system is progressing well and she hopes there will be a prototype for testing within 6-8 months.

Craig asked if the two delegate towns will be included in the system. Denise said that Colchester is working on a new system and the information will be available online. Spencer said that Charlotte is working on updating their system. They are working with the Tax Department to establish SPAN numbers for all parcels. Once there is a SPAN number for all parcels it will be easier to identify the current owners of parcels that have been sold.

### **Wastewater System and Potable Water Supply Rules:**

Ernie said that he plans to have a completed draft of the whole rule to Chris Thompson on June 6<sup>th</sup>. He asked to push the June TAC meeting back to June 24<sup>th</sup> so the group would be able to review a complete version that has initial Department approval which was agreed to.

Ernie led the group in a continuation of last month's discussion of subchapter 9. Most of the discussion related to clarification of the rules. There was discussion about allowing the use of drip dispersal piping in at-grade systems, pre-approval of groundwater monitoring plans and the collection of the data, when a hydrogeologic evaluation is required based on design flow and/or site, limitations, and use of groundwater monitoring versus soil identification.

Ernie will circulate a clean draft of the rules that does not show the track changes information in addition to a version with the track changes.

-----  
**Executive Committee:** Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

**Subcommittees:**

**Hydrogeology**

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson, Spencer Harris

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**Wastewater Strength**

Mary Clark, Cindy Parks, Peter Boemig, Bill Zabiloski, Roger Thompson, John Akielaszek,

**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

**Approved Minutes of the Technical Advisory Committee Meeting**

**May 20, 2014**

<b>Attendees:</b>	Roger Thompson	Steve Revell
	Craig Heindel	Anne Whiteley
	Gail Center	Steve Rebillard
	Gunner McCain	Claude Chevalier
	Rodney Pingree	John Beauchamp
	Ernie Christianson	Peter Boemig
	Mary Clark	

**Scheduled meetings:**

June 24, 2014            1-4 PM            Winooski Con. Rm., National Life – Montpelier

**Agenda:**

No comments.

**Minutes:**

Gunner had some editorial comments. Craig asked that the appropriate numbers be included when referencing legislative bills.

**Legislative Update:**

Ernie provided an update of the legislative session.

S.211 passed which expanded the use of holding tanks. The previous legislation required that the buildings be owned by the state or a municipality. The legislation now includes building owned for a charitable, religious, or non-profit use, such as a library or church. The new legislation requires that a bond be posted that is sufficient to cover the cost of at least 20 years of operation of the holding tank system. The bill allows the buildings to be converted to private use in the future while continuing the use of the holding tank system. This bill also created a study committee to evaluate ways to improve the delegation of authority to municipalities, including partial delegation.

H.526 passed which regulates development within 250 feet of lakes and ponds greater than 10 acres in size. The bill takes effect on July 1, 2014. There are conditional exemptions for the installation and maintenance of water and wastewater systems. If an area must be permanently cleared for the installation or maintenance of a water or wastewater system the area will count towards the total impact on the lot. Ernie will work on guidance for licensed designers and the Regional Office staff.

The language in H.857 was attached to S.211 and requires the Agency to submit a report to the legislature on how to create a partial delegation allowing municipalities to administer projects that connect to sewer and water when the sewer and water mains are owned by the municipality.

H.823 passed. This bill is related to reducing permitting requirements in designated downtown areas. The bill includes changes to the Wastewater System and Potable Water Supply Rules that requires issuance of a permit under the rules based on the certification of a the design be a licensed designer and municipal approval for connection to the water and wastewater systems. There will be little effect on Regional Office operations because existing permit reviews are already done this way and there are only a few designated downtown areas at this time.

## **Rule Revisions:**

Anne discussed the process for approval of rule revisions. She noted that the process has become more formal over the years and that the legislators expect complete answers to changes in the Rules by use of a cover sheet that must accompany the rules. Issues include who will be affected, the costs, climate impact, and technical justification. Anne said that any technical changes need to have a scientific basis; just saying that some other state uses the same approach is not a sufficient justification.

Ernie discussed the section related to groundwater monitoring and how the results should be used when calculating the induced groundwater mounding. The current monitoring process was created when only prescriptive designs were allowed and it works well for those designs. The current process is not easy to apply to systems using the performance based design approach and there are concerns that in some cases the resulting design limitations may be more restrictive than necessary. The group discussed this issue extensively and proposed to amend the rules to allow the use of the second highest groundwater level reading rather than the highest provided that any reading that is less than 6” below ground surface makes that monitor well location unacceptable. Ernie will draft up the committee’s comments and circulate prior to the next meeting. They also agreed to taking readings at intervals of 5 days or less. The TAC also recommended that all groundwater reading be taken by a licensed designer rather than relying on a property owner to take some of the reading.

Ernie will circulate a completed draft of all chapters of the rules prior to the next meeting in both annotated and unannotated versions.

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**Executive Committee:** Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

## **Subcommittees:**

### **Hydrogeology**

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson, Spencer Harris

### **UIC Rules**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Scott Stewart, Rodney Pingree, Kim Greenwood, Cindy Parks ,John Beauchamp, Gail Center



**Wastewater Strength**

Mary Clark, Cindy Parks, Peter Boemig, Bill Zabiloski, Roger Thompson, John Akielaszek,

**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

**Approved Minutes of the Technical Advisory Committee Meeting**

**June 24, 2014**

<b>Attendees:</b>	Roger Thompson	Denise Johnson-Terk
	Justin Willis	Mary Clark
	Jessanne Wyman	Craig Heindel
	Carl Fuller	Chris Russo
	Gunner McCain	Mark Bannon
	Peter Boemig	Steve Revell
	Ken White	Anne Whiteley
	Claude Chevalier	Ernie Christianson

**Scheduled meetings:**

July 15, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier
July 29, 2014	1-4 PM	Catamount Con. Rm., National Life – Montpelier
August 26, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier
September 23, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier

**Agenda:**

No comments.

**Minutes:**

No comments.

**Rule Revisions:**

Ernie led a page by page review of the draft rules and the group managed to get through the first 6 Subchapters and an initial discussion of two key points of Subchapter 7. Many of the comments related to minor wording and formatting changes. The following sections were discussed in more detail.

**Definitions:**

A definition of the base groundwater elevation was added to the draft. The group discussed this and the related definition of hydraulic base and whether both were needed. Ernie will rework these definitions. The group decided to hold off on making a decision until the groundwater monitoring section has been reviewed.

The bedroom definition was slightly reworked in the draft to presume that any room where people sleep, even if only an auxiliary use of the room, is a bedroom. This presumption can be overcome with a case by case determination by the Secretary.

The definitions for unconfined aquifer, unconfined unconsolidated aquifer, and unconsolidated soils were reviewed and minor changes may be made for clarity. The committee also discussed the use of impeding versus confining soils with Craig recommending the use of impeding.

**Exemptions:**

Permit exemption #25 for primitive campgrounds was discussed at some length. The concept of having a “campsite” of which there are no traces but that is not to be used more than once a week or more than 26 times in a year is not clear. Anne noted that some of the language is based on requirements established by the Department of Forest, Parks, and Recreation for primitive camping on state lands. The language might not work for all primitive campgrounds and Ernie will review it again.

On-farm exemptions were also discussed including the washing of fruits and vegetables to on-farm slaughtering. Ernie will clarify some of the language and how to determine flows for slaughtering with the Department of Agriculture.

Relatively few changes are proposed in Subchapter 4, 5, and 6 and most of the comments were editorial in nature.

The group discussed language in the last section of Subchapter 4 that allows for someone other than a designer to complete annual inspections required in a permit. The changes are intended to increase the number of people who can do the inspections and reduce the cost of inspections. Language was also added to clarify that a failure to comply with operational requirements that cannot be corrected at a later time does not create a title defect. The Agency may still take enforcement action related to the permit violation.

Discussion was started on Subchapter 7 on licensed designers, particularly around whether a Class A or B should design pump stations and sewer main connections. Some people were more comfortable with Class B Designers doing pump station designs because they are tested on it.

Future meetings on July, 15<sup>th</sup>, July 29<sup>th</sup>, August 26<sup>th</sup>, and September 23<sup>rd</sup> were scheduled. Ernie hopes to get through the rest of the chapters of the draft rules in the July meetings.

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**Executive Committee:** Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

**Subcommittees:**

**Hydrogeology**

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson, Spencer Harris

**UIC Rules**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Scott Stewart, Rodney Pingree, Kim Greenwood, Cindy Parks, John Beauchamp, Gail Center

**Wastewater Strength**

Mary Clark, Cindy Parks, Peter Boemig, Bill Zabiloski, Roger Thompson, John Akielaszek,

**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

**Approved Minutes of the Technical Advisory Committee Meeting**

**July 15, 2014**

**Attendees:** Roger Thompson Ernie Christianson  
Peter Boemig Anne Whiteley  
Steve Rebillard Chris Russo  
Mary Clark Denise Johnson-Terk  
Scott Stewart Rodney Pingree  
Claude Chevalier Ken White  
Craig Heindel Gunner McCain  
Chris Thompson

**Scheduled meetings:**

July 29, 2014	1-4 PM	Catamount Con. Rm., National Life – Montpelier
August 26, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier
September 23, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier

**Agenda:**

No comments.

**Minutes:**

No comments.

**Rule Revisions:**

Ernie led a page by page review of the draft rules starting in Subchapter 7.

**Licensed Designers:**

The group discussed installation certifications prepared by installers rather than designers. Ernie noted that the Wastewater System and Potable Water Supply Rules (WW Rules) allow this for some projects. Peter said that a designer should do the installation certification for municipal sewer connections. Ernie noted that each permit states whether a designer or an installer can do

the inspections and in some cases only a Class 1 Designer is approved. Anne explained that allowing installers to certify some installations is left over from a time when the Agency asked for authority to license installers. The Agency intended to allow licensed installers to do some installation certifications but when the Legislature decided not to support a licensing program for installers, the statutory language allowing installers to certify installations remained in the bill. Therefore, it is up to the language in each permit to specify who can do the certification. Peter said that there is some variation between Regional Offices and Ernie said he would work on guidance to get all of the Regional Offices on the same page.

Ernie noted some changes in definitions related to sewer lines that serve more than one building but which are not municipal collection sewers. This will allow Class A and Class B designers to design sewer lines serving more than one building as long as the total design flow for the shared line is not more than 1,350 GPD, does not include any manholes, and the line is not a municipal sewer collection line.

Roger noted that the revised language allows for Class BW Designers to design a non-public water supply that serves more than 24 people. These systems are fairly rare as they are limited to systems in operation less than 60 days per year. Ernie said this was an intentional change and conforms to the changes removing the 24 person limit for wastewater system designs.

Peter asked if the WW Rules should require a Class 1 Designer for systems with high strength wastewater. The draft rules require either an advanced treatment system or an oversized leachfield. If an advanced treatment system is to be used, the vendor must verify that the system is appropriate for the type and strength of waste. One concern is that operational methods vary from one building to the next and/or when the management of the property changes. For instance, a restaurant potentially has high strength wastewater but careful plate scraping and management of grease and food waste disposal can greatly reduce the wastewater strength. Then, when management changes, everything can go down the drain and overwhelm the system. The group supported a requirement for a Class 1 Designer when an oversized leachfield approach is used.

Mary asked if there should be any prequalification requirements for a person applying to become a Class A Designer such as a high-school degree or some years of experience. She notes that some states do set minimum requirements. Gunner, Craig, and Roger said that there did not seem to be a need for any prequalification requirements because there is a comprehensive written test followed by a field test to demonstrate the competence needed to become a Class A Designer.

The use of online and live video training was discussed. Mary will propose some oversight and verification requirements to ensure actual participation.

## **Design Flows:**

Roger asked about the proposed revision requiring that buildings subject to rental use and high levels or extended occupancy must design for 2 people per bedroom for all bedrooms. The group thought it would be difficult to apply this because all properties are subject to rental at some point in time and deciding when the use would be high and/or extended would be unclear. Ernie suggested returning to the existing language that leaves the decision up to the designer and the applicant and the group agreed.

Anne said that there is internal discussion of design flows and how conservative the design numbers should be. There will also be discussions about any differences in design flow numbers between public and non-public water systems.

The use of flow metering was also discussed. One question is whether the flow quantity used to size the system should be the 90<sup>th</sup> percentile or some other number. The group decided this might be somewhat case specific in that the actual flows exceeding the 90th percentile, or any other threshold, might be scattered over the course of a full year or might occur in a one continuous period. The systems with one period of intense use might need to be sized for a higher flow than one that receives only an occasional high flow. The group noted that designing water systems requires a different approach. While the source might be capable of handling short term demands at a rate exceeding the long term yield of the source, the distribution portion of the system needs to meet the instantaneous peak demand and the peak day requirements. In some cases, this demand can be met with storage capacity which may include storage in the well casing or in tanks.

Roger said that the existing language that allows for additional units (bedrooms, people, camp sites) to be connected to an existing wastewater system only when the system meets the requirements of the current rules should be retained. Ernie agreed.

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**Executive Committee:** Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

## **Subcommittees:**

### **Hydrogeology**

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson, Spencer Harris

**UIC Rules**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Scott Stewart, Rodney Pingree, Kim Greenwood, Cindy Parks ,John Beauchamp, Gail Center

**Wastewater Strength**

Mary Clark, Cindy Parks, Peter Boemig, Bill Zabiloski, Roger Thompson, John Akielaszek,

**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

**Approved Minutes of the Technical Advisory Committee Meeting**

**July 29, 2014**

<b>Attendees:</b>	Roger Thompson	Terry Shearer
	Ken White	Craig Heindel
	Steve Revell	Gunner McCain
	Chris Russo	Ernie Christianson
	Claude Chevalier	

**Scheduled meetings:**

August 26, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier
September 23, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier
October 14, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier

**Agenda:**

No comments.

**Minutes:**

No comments.

**Rule Revisions:**

Ernie led a review of Subchapter 10. The group supported a change in table 10-1 of minimum distances between wells needed to avoid interference testing. The distance will be reduced from 200 feet to 100 feet for wells providing less than 2 GPM. Ernie will review the minutes of earlier meetings and may propose reducing the distance for wells providing more than 2 GPM but less than 5 GPM from 500 feet to 300 feet because the jump from 100 feet to 500 feet seems excessive.

Craig asked if more than one well serving one use can be protected under the rules. Gunner said that there is existing guidance on this topic that allows for protection of two existing wells but that when a new second well is constructed only that well is protected. This issue has been reviewed in the past with a goal of protecting the wells needed to support a particular use without allowing for protection of wells that are unneeded and serve only to restrict others from constructing wastewater systems. The group said that the rules should include language dealing with this issue.

Access to septic tanks was also discussed. There are two concerns; access for pumping and maintenance and health issues. Septic tanks under porches that gradually turn into enclosed living space are a particular concern. The group recommended not allowing septic tank installations under porches, decks, or other structures. Access to well locations are also of concern.

A note will be added to section 10-1007 that additional isolation distances may be required for large capacity water sources or wastewater systems.

Ken asked when specific well construction methods can be used to reduce isolation distances. Craig mentioned the so called "Colorado Rule" where vertical separation is given the same credit as horizontal separation. There are concerns about this approach because a site with fractured bedrock can have rapid groundwater flow within the bedrock. Craig said that sites with lacustrine or bottom sediments can provide protection against vertical flow. The existing description of an impeding layer which allows for a reduction in isolation distance was reviewed and supported by the group. Steve and Craig said that it would be more accurate to state that a gradational analysis should be used, rather than a sieve analysis, when the particles of concern are in the silt/clay range.



Ernie will work on the language in section 10-1008 related to the Secretary's authority to increase or decrease isolation distances based on case specific factors.

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**Executive Committee:** Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

**Subcommittees:**

**Hydrogeology**

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson, Spencer Harris

**UIC Rules**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Scott Stewart, Rodney Pingree, Kim Greenwood, Cindy Parks, John Beauchamp, Gail Center

**Wastewater Strength**

Mary Clark, Cindy Parks, Peter Boemig, Bill Zabiloski, Roger Thompson, John Akielaszek,

**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

**Approved Minutes of the Technical Advisory Committee Meeting**

**August 26, 2014**

<b>Attendees:</b>	Roger Thompson	Steve Revell
	Terry Shearer	Peter Boemig
	Ernie Christianson	Gunner McCain

Craig Heindel

Mary Clark

Darlene Autery

Ken White

Claude Chevalier

**Scheduled meetings:**

September 23, 2014 1-4 PM Winooski Con. Rm., National Life – Montpelier

October 14, 2014 1-4 PM Winooski Con. Rm., National Life – Montpelier

**Agenda:**

No comments.

**Minutes:**

No comments.

**New Staff Member:**

Ernie introduced Darlene Autery who will manage the Underground Injection Control Program. Darlene replaces Cindy Parks who has moved to a position a Division Engineer in the drinking water program.

**Innovative/Alternative Systems:**

Mary gave an overview of the Norweco Hydro-Kinetic<sup>®</sup> Model 600 FEU System. The system uses a combination of activated sludge, aerobic conditions, anaerobic conditions, gravity settling, and effluent filtration. The system has received NSF/Ansi Standard 40 and 245 approvals. The applicant is asking for general use approval but with a limited numbers of installations to date the TAC thinks that a pilot approval is more appropriate at this time. The TAC also asked about the two-tank versus three-tank configuration and the costs related to operation and maintenance of a relatively complex, multi-chambered system.

**Rule Review:**

Ernie resumed the discussion at section 1-1014 dealing with water system issues. The TAC offered many comments about wording, references, and minor changes. Because most of this section had been reviewed by the TAC before, there were few major concerns.

Steve asked if the Water Supply Division has signed off on the current draft. Ernie said that they have submitted some comments and may have more before the draft becomes final.

Peter said that he remains concerned about the installation of water treatment systems for multi-family buildings without a permit. While a single family residence has the owner making decisions for his/her residence in a multi-family residence the occupants may be unaware of the contaminants of concern or if the treatment system is being operated effectively.

The TAC also discussed the issues related to closing wells that are not in active use as drinking water supplies. The rules require closure of unused wells, but many people who do not use the wells for drinking water want to either avoid the expense of closure or want to use the well for other purposes such as irrigation. The concern is that non-drinking water wells are not protected from sources of contamination and may become “lost” leaving people unaware even of the existence of the well. This should be further discussed and possibly at least a tracking system for such wells should be maintained.

The group suggested that the 4.5 GPD/linear foot loading rate noted in the exception in 1-903(d)(1)(C) should be reviewed to determine if another number is more appropriate.

Roger asked about the newspaper discussions of increased permitting efficiency. One approach suggested by the commissioner is to make all permits public process permits so that appeals could be limited to the information in the original record. This would have a significant negative impact on wastewater permits which are issued by the thousands and, when related to failed systems, need to be done quickly. Ernie said that he did not think permits subject to the Wastewater System and Potable Water Supply Rules would be included as public process permits.

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**Executive Committee:** Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

**Subcommittees:**

**Hydrogeology**

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson, Spencer Harris

**UIC Rules**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Scott Stewart, Rodney Pingree, Kim Greenwood, Cindy Parks ,John Beauchamp, Gail Center

**Wastewater Strength**

Mary Clark, Cindy Parks, Peter Boemig, Bill Zabiloski, Roger Thompson, John Akielaszek,

**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

**Approved Minutes of the Technical Advisory Committee Meeting  
September 23, 2014**

<b>Attendees:</b>	Roger Thompson	Ken White
	Peter Boemig	Kim Greenwood
	Darlene Autery	Justin Willis
	Jessanne Wyman	Chris Russo
	Claude Chevalier	Mary Clark
	Ernie Christianson	

**Scheduled meetings:**

October 14, 2014      1-4 PM      Winooski Con. Rm., National Life – Montpelier

**Agenda:**

No comments.

**Minutes:**

A note will be added to the draft minutes that the 4.5 GPD/linear foot loading rate noted in the exception in 1-903(d)(1)(C) should be reviewed to determine if another number is more appropriate. Roger asked if the list of subcommittees that is routinely included in the minutes

should be retained. The group decided that the inactive subcommittees for UIC and High Strength Wastewater issues should be dropped.

### **Compliance and Outreach:**

Chris Russo gave an update of her work. Chris has mailed information related to operation and maintenance inspections for Innovative/Alternative Systems. DEC now allows vendor approved service providers to submit the operation and maintenance reports that are required at least once per year for permits issued starting January 1, 2014. This will increase the number of people who can provide the required inspection reports and may reduce the cost associated with the inspections.

Chris said that DEC was pushing its new SepticSmart program that educates owners of septic systems on how to maintain and protect their systems. Chris provided copies of the handout to the TAC.

The new permit application tracking system is moving slowly. The current target date is the Spring of 2015.

### **Innovative/Alternative Systems:**

Mary told the TAC that company representatives would attend the next meeting to present the Anua peat filter treatment system.

The Bear effluent filter for installation in septic tanks has been reviewed and authorized for use in Vermont.

The renewal for use of Infiltrator Leaching Chambers has been issued with some updates. Peter asked if the documents could also state the loading rate in gallons per square foot of bottom area that has been approved, in addition to stating the number of chambers that are required based on the site specific soil conditions.

The Norweco Hydrokinetic system remains under review. The company is developing this system specifically to reduce nitrogen concentrations as nitrogen remains a major concern in many states. Kim said that the EPA is looking at this issue and may push all states to regulate nitrogen levels as a protection for surface water. Roger asked if the ability of the system to treat for nitrogen will be part of the Vermont review. Mary said that under the current rules only BOD and TSS are considered. Norweco currently has only one system actually installed and would not qualify for general use approval. There is discussion between DEC and Norweco about how much effluent quality monitoring would be required for a pilot use approval in Vermont. The company is suggesting 50 installations with 10%-20% being monitored. Peter said that seems pretty low for a new system. The company is also asking for a 90-180 day startup period before checking for compliance. Roger asked if this is appropriate if the systems can be approved for seasonal use which in Vermont might not be much longer than 90 days. Mary asked for thoughts on testing requirements and the TAC suggested starting with a rigorous process but with a built in approach allowing for periodic reductions in the amount of monitoring if the initial results were consistent and in compliance with the standards.

### **Review of the Draft Rules:**

Ernie briefly discussed the progress on the water supply section. The public water system Division has recently reviewed and commented and Ernie has updated the draft. A follow-up meeting is scheduled and Ernie expects only minor changes to be proposed.

Ernie discussed bottomless sand filters and suggested adding this design approach to the rules. One point of discussion was the amount of sand required below the point of wastewater application. Ernie proposed the same approach as for mound type systems with 3' of sand with septic tank effluent and 2' of sand if the effluent had been pretreated to filtrate standards. The TAC asked about materials and expressed concerns that even pressure treated wood breaks down over a period of years based on reports of systems in Rhode Island. Ernie will follow-up on this.

Appendix A was briefly reviewed. Ken offered comments on 4 sections related to well construction which will be incorporated into the draft.

Ernie said that he would have an updated draft out to the TAC for review prior to the next meeting.

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**Executive Committee:** Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

**Subcommittees:**

**Hydrogeology**

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson, Spencer Harris

**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

**Approved Minutes of the Technical Advisory Committee Meeting**

**October 14, 2014**

<b>Attendees:</b>	Roger Thompson	Steve Revell
	Peter Boemig	Rodney Pingree
	Darlene Autery	Anne Whiteley
	Carl Fuller	Ernie Christianson
	Gail Center	Tim Raymond
	Scott Stewart	Ken White
	Kim Greenwood	Craig Heindel
	Mary Clark	Claude Chevalier

**Scheduled meetings:**

November 20, 2014	1-4 PM	Perry Merrill Con. Rm., National Life – Montpelier
December 16, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier
January 13, 2014	1-4 PM	Winooski Con. Rm., National Life – Montpelier

**Minutes:**

The minutes were accepted as drafted.

**Meeting Schedule:**

The next meetings were scheduled for:

November 20, 2014 (note that this is a Thursday)

December 16, 2014

January 13, 2015

**Design Flow Discussion:**

Ernie reviewed the design flows proposed in the draft rules and discussed some possible changes under discussion with the Water Supply Section. Ernie introduced Tim Raymond from the Water Supply Section. Tim and Ernie discussed design flows for residential buildings and the difference in calculations for Public Water Systems as compared to Potable Water Systems. Ernie discussed a concept of using 60 GPD per person (120 GPD per bedroom) for the first 3 bedrooms in a living unit. Additional bedrooms could use a design flow of 60 GPD per bedroom unless the owner/designer believes a higher flow should be used to allow for higher occupancy rates. Tim said that in reviewing information from several Public Water Systems the average flows per living unit ranged from about 180 GPD to about 210 GPD. This information was based on metered flow readings and a peaking rate of 1.5 is using to ensure that the water system can meet the instantaneous peak demands that occur.

Ernie will create and circulate a spreadsheet that compares the existing design flows with his proposed design flows.

Roger asked if the leachfield loading rates should be revised to ensure that the organic loading rates do not exceed the soil capacity. Steve said that he was concerned about making changes that grant a reduction in one area and then imposes an increase in another area offsetting any gains.



### **Hydrofracturing and Deepening of Wells:**

Ernie also reviewed the portion of the Rules dealing with hydrofracturing and deepening of wells. Ernie asked if hydrofracturing or deepening an existing well should require a permit. The group agreed that if the hydrofracturing or deepening was used as a basis of an increase in design flow a permit would be required. The group was not as certain if the hydrofracturing was used to restore the flow to an existing well for an existing use. Wells permitted under the current Rules do not need a permit because hydrofracturing or deepening by itself does not affect the permitting requirements. There was some concern about older wells that might require analysis for an impact on a close by neighboring well under the current rules. Craig and Scott suggested that a permit should be required for systems requiring well yields of more than 5 GPM. Kim said that this might come up as part of the development of the implementation of the public trust policy for groundwater. Language addressing hydrofracturing and deepening of wells serving buildings or structures or campgrounds other than single family residences will be drafted and distributed to the TAC.

### **Other Topics:**

The definition of long term yield was discussed and the group agreed that a clear definition was needed. Also needed is a final decision about if and how overflowing wells will be regulated. This topic has been discussed by the TAC but the Agency has not made a final decision.

The section on groundwater monitoring and interpretation of the results still needs to be finalized.

The group also discussed whether projects with high strength wastewater should be limited to Class 1 (Professional Engineers) Designers and decided this would be a reasonable decision.

The basal area requirements for mound systems was reviewed. Ernie will consider if the requirement is needed if the design basis includes a linear loading rate.

### **Next meeting:**

Ernie will circulate an updated version of the rules which he hopes will be very close to being ready for the beginning of the rule adoption process.

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**Executive Committee:** Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Chris Thompson, Spencer Harris, Claude Chevalier, Craig Heindel

**Subcommittees:**

**Hydrogeology**

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson, Spencer Harris

**Bottomless Sand Filters**

Peter Boemig, Mark Bannon, Cindy Parks, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

**Approved Minutes of the Technical Advisory Committee Meeting**

**November 20, 2014**

<b>Attendees:</b>	Roger Thompson	Mark Bannon
	Travis Blodgett	Gunner McCain
	Craig Heindel	Peter Boemig
	Pete Sabo	Ernie Christianson
	Chris Russo	Mary Clark
	Brian Parker	Rodney Pingree

**Scheduled meetings:**

December 16, 2014 1-4 PM Winooski Con. Rm., National Life – Montpelier  
January 13, 2014 1-4 PM Winooski Con. Rm., National Life – Montpelier

**Agenda:**

Accepted as drafted.

**Minutes:**

Craig noted that the minutes should be dated October 14<sup>th</sup> rather than October 15<sup>th</sup>.

**Innovative/Alternative:**

Brian Parker, Eljen Corp. representative, returned to talk about the Mantis system. The Agency sent a review letter with a few questions that Brian addressed on a point by point basis. Vermont requires pressure distribution in all mound systems. One system currently approved as an Innovative/Alternative system uses a large diameter pipe that depends on ponding in the bottom of the pipe to create an even distribution along its full length, in lieu of small diameter pressurized pipe. Brian believes this creates a precedent for the Mantis approach of using either straight gravity through a 4" diameter pipe, or a small diameter pressurized pipe inside of a larger diameter pipe with 1" holes that allows gravity flow into system's modules. One concern was that Mantis pipe-in-pipe approach for the pressure distribution system could result in the smaller pipe blocking some of the discharge holes in the larger pipe. Brian displayed a model that showed the difference in pipe size and the size of the discharge holes in the larger pipe would not result in significant blockage. The Agency also asked about the potential for a buildup of biologic material on downward facing orifices in the larger diameter pipe that might not be scoured out by the flow from the smaller pressurized pipe. Because of the 1" diameter discharge holes this does not seem likely to be significant. Brian also responded to concerns that the larger pipe has a channel that fills with effluent and then discharges through 1" diameter holes and that this might result in all of the flow running along the larger pipe to the lowest 1" hole where, at least initially, all of the effluent would discharge. Brian offered some photos and video information to support a claim that equal distribution does occur with both the gravity and the pipe-in-pipe approach. The photos from the Massachusetts test center appeared to show that after a period of operation effluent was reaching all of the system with staining of the underlying soil for each of the 5 sections in a module. The video showed a discharge from all of the 1" holes in a demonstration system. The TAC asked about the flow rate for the demonstration system as the observed flow seemed to be large compared to what would happen in an actual system. The

TAC asked if field installations could be held to the same construction standards used for the demonstration system. The TAC discussed the pipe-in-pipe approach and is still concerned about uneven distribution and suggested possible modification of the system which Brian did not think were workable. There were also questions about testing of the pressure distribution system at the time of construction. The Eljen proposal is to assemble the system and observe the flow from the last orifice in each lateral. If the flow rate from the last orifice is acceptable then it is assumed the system is pressurized correctly. However, this does not address the requirement for showing that the system will have a maximum of 10% difference between any two orifices as required in the Vermont Rules. Brian said that a procedure could be added that would require inspection of the pressurized pipe to ensure proper hole spacing and that the holes are free from burrs caused by the drilling process prior to installation. Brian noted that Vermont Rules only require one orifice per 25 square feet of leachfield and that with the Mantis system consisting of 5' modules there should be little flow variation between modules. Brian said that he believes that the distribution system is equivalent to other systems currently approved in Vermont and should be approved.

Brian responded to a question about other states approval of the pipe-in-pipe distribution system and stated that all of the 26 states that have approved the Eljen GSF (Geotextile Sand Filter) system allow this approach. Connecticut approved an earlier version of the Mantis system and they have been installing them for about 8 years. Brian also responded to a question about passive airflow from the chambers back to atmosphere saying that the construction of the system has a pathway for airflow from the chambers to the roof vent of the plumbing system. When the burial depth exceeds 18" an intake vent is added to the chambers to increase air flow. Brian suggested that Bob Scully of the Connecticut Department of Public Health might be a person to ask about the effectiveness of the pipe-in-pipe approach.

The Agency will consider the information provided by Brian and the TAC's comments and send a review letter to Brian.

Pete Sabo of AK Industries Inc. presented information in support of a request for approval of the Hydro-Action Industries aerobic treatment units. The Indiana company offers a series of systems that can treat from 500 gallons per day to 1,500 gallons per day that can be combined for larger flows if needed. The company also offers pre-treatment tanks and pump/dosing tanks as needed to make a complete system. While the initial application is only for compliance with the Vermont requirements to produce effluent with 30 mg/l or less of BOD and 30 mg/l or less of TSS, the company offers a nitrogen reduction option. The basic system and the nitrogen reduction process have both received NSF certification. The aerobic treatment process includes an activated sludge approach and test results indicate the levels of less than 5 mg/l of BOD and

less than 7 mg/l of TSS can be achieved. The company recommends twice a year maintenance inspections but believes that once per year ensures good operation. Pete noted that the maintenance process is very quick and simple with only simple checks needed for the air injection system. If the injection system is not meeting the flow requirements it is inexpensive and quick to replace the flow nozzles. The TAC encouraged Pete to apply for any options he wished, including the nitrogen reduction system. Even though Vermont does not have a nitrogen reduction requirement at this point, and will not certify the system for the nitrogen reduction, there may be a requirement in the future and in the meantime some designers and homeowners may want to use the technology. The Agency will do a detailed review and send a letter with any questions.

**Rule Review:**

Ernie said that Carl Fuller is working on a draft of the analysis of using 60 gallons per day per person in comparison to the existing rule of 70 gallons per day per person. This will be circulated to the TAC when ready.

Ernie said he is still working on the design flows for campgrounds and hopes to end up with one design flow regardless of how many months per year the campground operates. Ernie circulated a USDA technical paper on water use in Forest Service Campgrounds to the TAC and used this as a basis of the proposed flow numbers in the current draft rules. Roger said that Ernie should talk with the Vermont Campground Owners Association about this proposal as some of the new numbers will be an increase in design flow.

Ernie is also going to look into design flows for front loader washing machines versus top loading to see if there is any basis for using different flows based on the type of machine.

The rules will need to be clear about when designs are based on metered flows for water or wastewater and on how to deal with the 7 day equalization of design flow concepts.

Rodney recommended that Note 2: found in Table 8-1, be copied into Table 8-2 and Table 8-3 for consistency and clarity of rule jurisdiction. Rodney also recommended that Water Vending Service/Machines be added to Table 8-3 (following Veterinary Clinic), because the use of these devices is increasing nationally and they potentially can be a significant impact on a water source which should be considered in the design flows

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**Seasonal High Water Table Monitoring**

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Dan Wilcox, Mary Clark

**Approved Minutes of the Technical Advisory Committee Meeting**

**December 16, 2014**

<b>Attendees:</b>	Roger Thompson	Steve Revell
	Peter Boemig	Justin Willis
	Craig Heindel	Mark Bannon
	Claude Chevalier	Ken White
	Gunner McCain	Mary Clark
	Chris Russo	Scott Stewart
	Darlene Autery	Travis Blodgett
	Ernie Christianson	Kim Greenwood

**Scheduled meetings:**

January 13, 2014      1-4 PM      Winooski Con. Rm., National Life – Montpelier

**Agenda:**

Amended to add Mary's comments on the recently issued RFP for diagrams for the updated Wastewater Rules.

**Minutes:**

The minutes were accepted as drafted.

**Request for Proposal:**

Mary said that a request for proposal had been published asking for proposals to prepare diagrams to be included in the update of the Wastewater System and Potable Water Supply Rules.

**Compliance Update:**

Chris Russo gave an update on her activities related to ensuring compliance with the Wastewater System and Potable Water Supply Rules (Rules) and the permits issued under the Rules. The second annual meeting with service providers was held on December 4, 2014 and Chris distributed copies of the meeting notes. Eight service providers met with representatives from the five regional offices and the central office. The new Regional Office Tracking System was discussed. The programming for this system is taking longer than expected but remains a DEC priority. The service providers asked about electronic submission of inspection reports and this will be included in the system. A temporary Access Data Base is being developed that will be used to track a limited number of permits with multiple compliance dates and conditions because of the delay in full implementation.

Chris said that the information cover sheet which should be included with any inspection report filed with DEC is being used and more of the reports now include the DEC permit number so they can be properly tracked. Chris asked the service providers to submit all of their inspection reports even if the WW Permit number is unknown or the system is believed to be exempt. The Regional Office Staff will attempt to match the reports with the original permits and if a permit number is not found staff will file the Inspection Report in the "Town" folders that are currently setup for their Regional Office. The service providers will be notified whenever a match with a WW Permit number can be made.

Standardized permit language has been identified as a need. Currently permits are not able to be viewed between Regions and are not tracked by category (i.e. brewery, restaurant, or meat processing facility). The new Tracking System will allow staff to view permits from other Regions and will allow sorting by category. Central Office Staff have recently assisted the Springfield Regional Office with permit language for a nonstandard permit. Peer review has resulted in clarification on permit language so that expectations for monitoring, reporting, and sample analysis are more precisely defined and enforceable. Ernie thought that approximately

1% of the permits fall into this category. Chris has discussed the use of standardized reporting forms that could be required by a permit condition and capture the permit required information in a consistent manner. A form has been drafted with the expectations that it would be able to be modified by the Regional Offices to capture unique permit conditions but would require the signature of the responsible party to allow for compliance and enforcement follow-up if required. Anne Whiteley is offering recommendations on Permit and Form language.

DEC also created a Notice to Owners of Innovative and Alternative (IA) Wastewater Treatment Systems document and an Installation Certification of Wastewater and Potable Water Supplies document that service providers are using to educate system owners on the requirements for maintaining and inspecting their systems. These are available at: [www.wastewater.vt.gov](http://www.wastewater.vt.gov)

Chris mentioned that the service providers also discussed the use of biological system additives. TAC members were concerned about the use of system additives and wondered if they were being overused and if the system manufacturers supported such use. Chris said that the additives were being used in very limited circumstances for specific problems.

Some of the proposed changes to the Rules that were discussed included allowance for flexibility in inspection dates which would allow for a group of systems in one geographic location to be done at the same time reducing the cost of providing the inspection service. The service providers also commented on the proposed bottomless sand filter requirements and noted the freezing of the force main where it rises up to the distribution manifold can be a problem. Drain back provisions are important but not always effective. One suggestion was to install heat tape that could be used if a freezing problem occurred. In addition, the service providers recommended breathable filter fabric material between the sand and the cover material and that bark nuggets be used rather than bark mulch.

The service providers said the meeting was useful and DEC received good feedback that can be used to improve the rules and the Regional Office operations.

### **Innovative/Alternative Systems:**

Mark raised a concern that a condition has been included in individual permits stating that the approval for a specific I/A system would expire on a date not long after the permit was issued. His client was very concerned that his permit might not be valid after the expiration date for the treatment technology. Mark also asked why I/A approvals included an expiration date when the Rules do not specifically state that I/A approvals should have an expiration date. The TAC agrees that when a permit is issued based on a specific treatment system, the treatment system approval should be referenced and a copy of the approval attached to the individual permit. This should be recorded in the town records as part of the permit. These steps increase the chance that the original permittee and any future owners will become aware of the requirements to



operate and maintain the treatment system. Ernie said that he would look into the standard format for individual permits and revise the permit condition to reference the specific treatment system but without stating the expiration date of the I/A approval. Gunner suggested adding a statement that expiration of the I/A approval does not affect existing individual permits that have already been issued. Ernie said that the Rules allow for conditions to be included in I/A approvals that ensure compliance with the Rules. Expiration dates ensure that the manufacturers keep up on their reporting requirements and ensure that approvals reflect any changes to the product.

Mary asked for comments related to the Hydro-Action treatment system request that was presented to the TAC at the November meeting. Roger and Gunner said that they did not see any red flags. Mark asked if the system would receive a general use approval. Mary wants to conduct further research on their Maryland approval, and on two state's denials. Mary also said she wanted to look into the tank construction a little more. The company has provided a test that was conducted in 2002, but she wants to confirm third party testing on the current versions. Their literature indicates wall thickness, while an average of 3/8" thick, can be as little as 5/16". This may be acceptable but it is important to ensure that the tanks will be sufficiently strong and durable for Vermont's climate.

Mary also asked about the Eljen Mantis system. The company provided additional information at the previous TAC meeting and is asking for three methods of distribution. Gravity flow and pumping to a distribution box could both be approved for inground systems. Eljen is still asking for gravity flow to mound systems while also offering a pipe-in-pipe form of pressure distribution. The TAC reviewed the information related to the approval of the Presby Enviro-Septic system and the Mantis system and the group believes the distribution methods are not equivalent based on the information submitted to date. The TAC encouraged Mary to request that Eljen provide proof of rapid biomat development that would result in even flow to all of the modules served by the distribution pipe, which the TAC understands to be the basis of their argument for why the pipe-in-pipe method produces the equivalent of uniform distribution in a short time period (few weeks). The photos provided show a gray biomat only directly under the modules, not elsewhere in the mound sand. Mary will follow up with the Connecticut Department of Health and the Massachusetts test center to see if they have any information about the time needed to achieve even distribution over a full length of the system.

#### **Examples for the Simplified Hydro Method 12/10/2014:**

Ernie reviewed this worksheet which provides two alternative ways to evaluate the hydraulic capacity of a site that has two soil layers with different capacities. One approach is to use the full depth of the available soil but assign only the capacity of the most restrictive soil layer. An alternative is to assign different capacities for each soil layer that apply only to the available

thickness of that layer. The alternative will result in a higher site capacity and in some cases the increased capacity will be significant. The worksheet analyzed two different sites and the TAC said that only the second example should be included in the Rules. An example of the method for a single layer soil should also be included. Roger asked Craig and Steve if they supported the methods described in the worksheet and both said the science is sound. Mark mentioned that the approach seemed very conservative and asked Craig and Steve if they expected to see groundwater mounding as high as predicted by this method. Craig and Steve said that they would not expect to see a large groundwater mound for small to midsize systems but supported the use of the simplified method for use by those not considered to be qualified hydrogeologists because it is conservative. Mark also mentioned that the Colorado School of Mines has a good website with information about groundwater mounding calculations.

### **Design Examples for High Strength Wastewater Projects:**

Ernie also reviewed a worksheet of examples of methods that might be added to the Rules as a basis for modifying system designs when the wastewater strength is greater than normal domestic strength. One issue is whether normal should be average strength of septic tank effluent, which in one report is considered to be 170 mg/l of BOD, or should it be 400 mg/l which is the upper limit in the existing Rules for moderate strength wastewater. The 400 mg/l limit was first added to the Rules when prescriptive requirements for recirculating sand filters were added and reflects the maximum loading rate for a sand filter, not for a leachfield. The TAC also asked if the increase in the size of a leachfield needed to be directly proportional to the increase in wastewater strength. Craig suggested looking at research about long term acceptance rates, including work by Richard Otis. Steve said that Bob Siegrist, of the Colorado School of Mines, also worked on this issue

### **Design Flows:**

Roger asked Ernie about the status of his evaluation of whether residential design flows should be changed from 70 gal/person/day to 60 gal/person/day. Ernie said that he had reviewed a lot of information and thinks the design flow should be kept at 70 gal/per/day for those systems serving from one to four residential units to ensure that systems serving one or a few units will function if the households use above average amounts of water. Systems serving five or more units are already allowed to use lower design flows because of the averaging effects from combining multiple units. Justin asked about septic tank size and if multiple compartment tanks should be considered. Justin said that his field observations found that some malfunctioning systems could be improved by using larger tanks. The TAC agrees that multiple compartment tanks do seem to perform better and that larger tanks also seem to perform better but that some research is needed to determine if the additional cost is justified.

**Bottomless Sand Filters:**

Ernie used the small amount of remaining time to begin the review of his draft of the section for bottomless sand filters. Mark asked how many sand filters are currently in use in Vermont and how many have failed. Ernie said that there is no record of all of the sand filters because many were installed prior to universal state jurisdiction but that it is likely there are a few hundred systems and not many reports of failures. Mark then asked why it is proposed under the new rules that a replacement area must also be designated. Craig echoed this and said that if the site evaluation is done correctly any problems with the system can be corrected by making repairs to or reconstruction of the sand filter itself. Craig suggested regulating bottomless sand filters as if they are mounds without sand side-slopes. Ernie said that he is concerned that allowing bottomless sand filters for new construction is a pretty big change and that a site that only met the minimum requirements for a primary system would have very little room to fix a malfunctioning system. With a mound system, which does not require a replacement area, there is at least 25’ of room on the downslope side where the system could be expanded a little which might cure the problem. Craig suggested allowing systems using filtrate without a replacement area. The TAC recommended allowing systems with septic tank effluent with a maximum loading rate of 1 gal/sqft.

The current Rules only allow bottomless sand filter installations as best fix replacements while the proposed new section would allow for a bottomless sand filter on any complying site.

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