

Approved Minutes of the Technical Advisory Committee Meeting
April 17, 2012

Attendees: Roger Thompson Scott Stewart
Mary Clark Justin Willis
Stephen Revell Ernest Christianson
Cindy Parks Peter Boemig
Jessanne Wyman Bill Zabiloski
Rodney Pingree Craig Heindel
Spencer Harris Gail Center
John Beauchamp Claude Chevalier

Scheduled meetings:

May 22, 2012	1-4 PM	Liquor Control Conference Room- Montpelier
June 19, 2012	1-4 PM	Liquor Control Conference Room- Montpelier
July 17, 2012	1-4 PM	Liquor Control Conference Room- Montpelier

Agenda:

The agenda was reviewed and an item was added by Scott's request to discuss the recent Act 250 memo related to "Clean Slate" issues.

Minutes:

The draft minutes of the March 20, 2012 meeting were reviewed and accepted without changes.

Act 250 memo on "Clean Slate" Issues:

Ernie said that this memo just standardized the way the Act 250 District Commissions operated. The Clean Slate concept is an exemption in the Wastewater System and Potable Water Supply Rules (Rules) that covers everything in existence before January 1, 2007. Act 250 often incorporates permits issued under the Rules as a demonstration that a project will comply with Act 250 Rules. The question of whether or not to accept the exemption that eliminates any violations of the Rules created prior to January 1, 2007 was an issue under Act 250 and the memo now clarifies how to deal with projects subject to both the Rules and Act 250 when the project is covered by the Clean Slate exemption.

Radionuclide Issues:

This issue was continued from the previous meeting where Dr. Irwin from the Vermont Department of Health presented a great deal of information about radionuclides in drinking water. Gail said that Dr. Irwin wanted to provide a general overview from the Health Department perspective with a few basic concepts. Radiation is in three forms alpha, beta, and gamma. Alpha radiation is stopped by a sheet of paper, beta radiation is stopped by your hand, while gamma radiation easily passes through your body. Alpha and beta radiation is primarily of concern when the particles emitting the radiation are ingested or inhaled. These particles also decay into other daughter particles that emit dangerous radiation. Water treatment systems can remove radium and uranium particles which are the most common sources of radiation in drinking water supplies. The Health Department is concerned about how to advise people who contact them about contaminated water supplies. It is important to eliminate the consumption of contaminated water but the existing requirement to obtain a permit under the Wastewater System and Potable Water Supply Rules is a time consuming and expensive impediment. To the extent possible the permitting requirements should be eliminated so that treatment systems are installed when a contaminated water supply is found because the risks associated with installing, operating, and disposing of any filter backwash is much less than consuming the contaminated water. Gail said that John Beauchamp had asked about the accumulation of radionuclides in carbon filters and that the Health Department through Dr. Irwin has field testing procedures that could be used to quantify the level of radiation exposure.

Gail further noted that the Health Department is already doing most of what is required in currently proposed legislation (S.183) which is to recommend that people test their water supplies periodically for pathogens and other contaminants including radionuclides.

One issue related to the disposal of filter backwash either into existing domestic wastewater systems or to separate disposal systems regulated under the Underground Injection Control Rules (UIC Rules) is the quantity of the backwash. Ernie asked John for an estimate based on his experience over the years. John said that there is a wide variation between water treatment systems depending of the nature and concentration of the contaminants. In some cases the only issue is hardness of low intensity and treatment is simple and does not require a lot of filter backwash. In other cases it might be necessary to treat for a high level of hardness first followed by a second or even third form of treatment for other contaminants. Each of the treatment processes may have its own filter that needs to be backwashed. The backwash process can sometimes be staggered because not all of the filters require the same amount of backwashing. In addition to the quantity of the backwash there may be concerns about the rate of discharge. John noted that treatment systems are designed to treat at a maximum flow rate of 5GPM or more depending on the peak demand of the water system. The filter backwash rate is usually greater, often twice the treatment flow rate.

There are also concerns about the impact of the filter backwash on domestic wastewater disposal systems. Some manufacturers of advanced wastewater treatment systems do not

allow discharge of the filter backwash into their treatment system in which case the filter backwash may be added to the system downstream from the treatment system. Craig asked if there is any evidence that filter backwash that bypasses the septic tank results in failed wastewater systems. This seems to be a difficult question in that there are many factors that can cause a system to fail. John asked if there are methods to discharge into a septic tank that reduce the impact on the tank's capacity for treatment by settling and flotation. There are methods to deal with deal with high flow rates with separate tanks but there are concerns that the filter backwash chemistry itself reduces the settling and flotation separations on which the septic tank process depends.

Roger asked for an estimate of backwash flow quantity that would cover 80%-90% of systems. John described a system with a backwash system operating for 8 minutes at 9.2 GPM for about 80 gallons of flow. This system might also use an additional 40 gallons of flow if there is an air intake system and an additional 70 gallons of flow for a water softening component. If all systems backwashed on the same day it would be about 190 gallons, though a typical system with these components might average about 80 gallons per day.

Cindy said that as part of her work in the Underground Injection Control program she has contacted other New England States for their approach to the disposal of filter backwash. She found that Connecticut and Massachusetts prohibit softener or ion exchange discharge to a domestic wastewater system. Rhode Island is moving in that direction as well. Craig asked if there is a reason for this and Cindy said that these states believe they have detected an influence from the salts associated with water softening on the source well. Craig asked how requiring a separate disposal system helps and Cindy said it was because the location of the separate system is subject to an isolation distance to protect the source well.

Claude said that the total volume of salt used in water softening systems is a tiny fraction of the salt spread on roads every winter. John agreed noting that in his 25 years of testing with TDS(total dissolved solids) and hardness meters he mostly finds that when the levels in a drinking water well are very high there is a source of road salt nearby. John noted that while may be an impact related to water softening it is clear that failure to treat results in the consumption of many other contaminants that may have more significance. John also noted that careful setting of the equipment reduces both the adverse impacts and the cost of operating the system. He finds many systems that are just plug in installations by people who do not really understand how water treatment works are set at rates that waste a lot of salt.

Craig noted that there has been a large increase in the use of water treatment systems during recent years. Many of these systems have been installed and connected to existing domestic wastewater disposal systems and he is not aware of a significant increase in failed systems. Mary agreed that there is not a lot of information but there are still some problems. Peter asked if there is evidence that a restrictive layer forms in the leachfield. Craig said there are some ongoing studies that may deal with this. John noted that one person he talks with thinks that the magnesium and the calcium need to end up in the

same disposal system in order to balance the soil chemistry. Justin and Spencer said they have been seeing some failures with some cases where the operation of the septic tank is obviously disturbed and in some cases where the distribution pipe is completely failed. Justin and Spencer say they both bypass the septic tanks with filter backwash. Craig said that he had one case where the contents of the septic tank were completely homogeneous. Steve said the general consensus of designers is to bypass the septic tank. Roger asked if a septic tank filter would be effective at capturing the material from a disturbed septic tank and Craig said that it might not be effective if the material is actually dissolved in the wastewater or suspended as fine particles that are smaller than the openings in the filter. Justin said that he is seeing deteriorated distribution boxes in systems with filter backwash. The group noted that there are now a lot of plastic options for d-boxes and septic tanks. Craig asked if we were keeping the option to discharge filter backwash into the septic tank as well allowing a bypass of the septic tank. Ernie said he would want to allow both options.

UIC Exemption for Filter Backwash:

Ernie said that he is inclined to create a conditional exemption in the UIC Rules, at least for single family residences. Roger reviewed the past TAC work on this which at a previous meeting had reached a tentative approach of (1) a gallon per day limit which was not determined, (2) a minimum isolation distance to a water source, and (3) a minimum separation to the seasonal high water table.

Craig asked if the filter backwash discharge needs to be factored into the design for a new or replacement leachfield. Peter said that he considers this in light of the reductions in safety factors that have occurred in past rule revisions. There was discussion about whether the exemption should be limited to single family residences or if small public buildings should be included. There was also discussion about using a design flow, with one suggestion of using the 1,350 GPD limit that already divides what professional engineers and other licensed designers can do. The consensus was that the exemption should apply to all systems where the design wastewater flow for the building did not exceed 1,350 GPD. While this might result in a few systems being undersized and therefore surfacing it should be an issue for the designers to resolve. Steve asked if there would actually be a significant problem if a system surfaced and suggested that without pathogens a surfacing system would not present a health hazard. John said it would be great to get septic designers to think about the potential need of a system for filter backwash when they are designing the potable water supply and wastewater disposal systems. Just allowing a space on the plans would be a big help.

Ernie asked why the statutory exemption (10 V.S.A. section 1974(4)) related to the design of water treatment systems did not include nitrate treat systems. Gail remembered that at the time, Lance Phelps had said that nitrate treatment systems were not as “black box” as other systems such as those for hardness or pathogens. Because of the need for an individual design it was decided that the systems should be done by professional engineers. John said that in the past several years the designs for nitrate treatment systems have become more standardized and may be in the same category as those

currently exempted. Craig said the statute and rules should be updated to reflect our updated knowledge.

Roger asked about the timeline for making changes to the UIC Rules. There are two steps, changing Vermont Statutes and Rules and getting EPA approval because the Underground Injection Control Program is a federal delegation. Ernie said that the Division is working on the conditional exemptions and hopes to get a set of rules to LCAR (Legislative Committee on Administrative Rules) by late fall of this year.

High Strength Wastewater Subcommittee:

Mary gave a short review of the committee's work. There have been two meetings and Cindy will circulate the minutes of those meetings. The group is leaning towards recommending the use of guidance and training as opposed to formal rule changes. The subcommittee realized that there are problematic wastewaters that do not fall into the high strength category and will deal with those as well. Roger will work on a matrix that designers might use to identify issues during the design phase of a project that will list potential problems for various types of uses.

Peter said that suggestions about possible solutions could be included. For example, a project with high BOD might either use an advanced treatment system to reduce the BOD concentration prior to discharge to a leachfield or install a larger leachfield which would reduce the per square foot loading rate.

Mary said that the Massachusetts test center is looking at the effectiveness of wastewater treatment systems relative to pharmaceuticals. Both aeration and drip dispersal systems appear to be effective for many of the common pharmaceuticals. Gail asked if the effective treatment applied to hormones and the answer was yes. Peter said that antibiotics do not seem to be treated to any great extent but notes that because the discharge of these into any particular system is likely to be for a short period of time that the risk may not be too large. Hospitals and nursing homes are more apt to be problems with Craig saying he has worked on two nursing home projects with major problems. Mary said that at the Old Saybrook Nursing Home facility was discussed at the recent NOWRA Conference. This project has had repeated failures but now seems to be doing well with a SoilAir System. This particular project has divided the leachfield into 4 sections. One section is flooded to create anaerobic conditions while the other three are getting air injection. This cycling between aerobic and anaerobic seems to be effective and also is effective at nitrogen removal.

End of Year TAC Report:

Ernie said that recent legislative action was taken to eliminate the preparation of many legislatively required annual reports on a government wide basis. This reduction included the mandate for the TAC to produce an annual report. Roger asked if the group thought it would be useful to continue to prepare a report. It was tentatively decided to prepare the report but without attaching the TAC minutes. Mary asked about posting the minutes to the web so that people who are interested will have access. Ernie said there is already a

place on the Division website for this information though he is behind in getting the information posted.

Soil Identification for Leachfield Sizing:

It was decided to form a subcommittee of Steve, Spencer, Bill, Craig, and Roger with possible inclusion of Steve Rebillard and John Akielaszek. Steve had previously copied soil identification information from old State of Vermont design guidelines for town ordinances that Ernie will circulate. Roger will arrange for a meeting of the subcommittee.

Meeting Dates:

The group decided that the next meetings would be on May 22nd, June 19th, and July 17th.

Agenda for Next Meeting:

Discussion of bottomless sand filters.

Items prioritized for discussion with high, low, and medium ranking

1. Soil identification vs. perc test **medium**
2. Curtain drain with presumption of effectiveness **high**
3. Revisions to desktop hydro chart **medium**
4. Minimum amount of sand under a mound **high**
5. Water Supply Rule update **high**
6. Seasonal High Water Table determination for performance based systems **high**
7. Wastewater Strength

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, and Steve Revell.

Overshadowing of Isolation Distance Issues –

Anne Whiteley, Ernie Christianson, Roger Thompson, John Beauchamp,
Gail Center, Chris Thompson

UIC Rules and Geothermal Wells -

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

SHWT Monitoring –

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

UIC Rules and Disposal of Wastewater from Water Treatment Systems –

John Beauchamp, Gary Adams, Roger Thompson, Ernie Christianson,
Gail Center, Cindy Parks

Wastewater Strength -

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