

Minutes of the Advisory Committee Meeting of 4-10-2001
As Revised

The Technical Advisory Committee met on April 10, 2001 and continued work on the viral treatment issue and the innovative system review and approval process.

Roger Thompson handed out a copy of a paper dealing with sand filter designs and issues. David Cotton handed out an ASAE paper outlining possible treatment levels with performance standards for each and a modified NOWRA document for possible use as a "Framework for Unsewered Wastewater Infrastructure."

The meeting began with David doing a quick review of the "framework" document with a proposal that this be used as a basis for developing a management approach to non-municipal type systems. This approach would cover both conventional and innovative systems. Rich Czaplinski suggested this was an administrative issue rather than technical, and that the committee was dealing with technical issues. This was discussed with general agreement that they were separate topics but that both needed to be addressed as part of the process.

Chris Recchia handed out a list of questions that he wished to discuss as part of deciding on the appropriate method of dealing with the issue of viral treatment and asked if the list was complete and appropriate.

Craig Heindel asked that we keep careful records of how we eventually decided the issues so that when future revisions are considered we would have an understanding of the reasoning behind the original decisions. Craig also suggested that we needed to look at cysts and protozoans. It was agreed that this should be done and that bacteria also needed to be considered in addition to viruses.

In response to a question on whether viruses are an important issue, Gail Center reported that she had reviewed the issue with other Health Department staff. There were about 15 cases of hepatitis A in Vermont in 2000 and 24 in 1999. They also found multiple cases of various other viral diseases. The staff is also concerned about future infections transported from foreign countries. They mentioned that there was a current issue in the Dominican Republic and a concern here because of the babies being adopted and being brought to Vermont. There are also concerns related to new strains of pathogens that are drug resistant, which will be discharged to septic systems. Their counsel was to be cautious in making changes that could result in reduced protection of water supplies because the viruses themselves may become a bigger threat. Gail indicated that 88.2% of the outbreaks studied are linked to groundwater contamination.

Richard Deso asked if water supplies were being tested for viruses. Gail responded that there is no test that is affordable for routine use.

Rich said we need to be careful about assuming because we don't see "dead bodies" that things are ok. If we wait until there are "dead bodies" it will be too late to avoid a disaster.

The issue of how many logs of removal are sufficient was discussed. There are some numbers such as wanting a 7-log reduction in viruses in effluent prior to reaching a water supply. Bruce Douglas raised the subject of reclaiming wastewater for use on golf courses and talked about the levels of treatment required for that application. There are some numbers related to how much removal might occur in various soils and treatment systems. However, the information is not complete enough to make decisions about particular sites and/or systems. Treatment of surface water for drinking only requires 4 logs of removal but the starting point is much different. All of this led to a discussion of how could we make any progress if we felt that the concern was real, which many people thought it was, without specific testing and numerical results.

Chris suggested that we look in the area of offsets, where certain design factors such as soils or loading rates or isolation distance could offset any uncertainty in what was happening in the innovative system or final disposal field. David was concerned that innovative systems would be held to a higher standard and pointed out that conventional systems are subject to modes of operation that could result in poor treatment. For example, a new conventional system, constructed in coarse soils, can have high loading of small areas of the system because of poor distribution. This high loading would result in rapid travel down to the groundwater under that portion of the system until a biomat forms. As the biomat forms, the areas of high loading migrate along the edges of the biomat. Only when a biomat has formed across the whole system does the biomat work to limit the rate of flow into the soil under the system. David thought that compared to this scenario, the pressure distribution associated with fixed film advanced treatment systems, would give better treatment.

The consideration of ways in which conventional systems may provide poor treatment led to comments that at some point conventional systems may need to be examined for possible upgrades, especially in distribution of the effluent.

In talking about biomats in conventional systems the topic of long term acceptance rates, LTAR, was briefly mentioned. David and Craig noted that research suggested 0.25 GPD/SQFT, which would quadruple the size of the systems used in fast perc rate soils. Roger noted that there might be some offset with changes in design flow.

The group then discussed how the viral reduction occurs. Some occurs by inactivation of the virus, with temperature being the primary factor, and some occurs by permanent adsorption of the virus onto media particles and/or associated biofilms around the particles. The issue of the biomat was discussed. Craig asked if the biomat is important how can we support sand filters. The literature and the testing that has been done seems to support that the thin biofilms are able to do much of the treatment even though they do not necessarily create unsaturated flow in the sand. David said that unsaturated conditions appear to be a key factor. The group reviewed the different factors

associated with inactivation and retention with a view towards deciding if these could be used as offsets. Blair asked about the “A” horizon and it was agreed that the “A” horizon, and per David, down to about 16” which includes the “B” horizons, was the best layer for inactivation of viruses through desiccation, temperature, biologic predation. The high level of organic material increased the rate of inactivation.

The discussion started with how to establish logs of reduction. This would be difficult so the suggestion was made to consider a point system. The difficulty in assigning points was acknowledged. Chris asked that everyone consider such a system and return to the next meeting with thoughts on constructing the system.

Chris reiterated that he would not allow a lack of perfect knowledge to bring the process to a halt. He said he believed that we could find a way to construct a system that would provide a valid method of constructing offsets.

The group discussed whether the two-year time of travel used in the Small Scale, Indirect Discharge, and the Water Supply Rules was a valid number. Craig indicated that when the number was developed it was decided that about one year was the consensus number and Skip suggested using two years as the safety factor. Further discussion, with reference to Marilyn Yates’ work, based on investigation of actual illnesses from contaminated water supplies, seemed to support the two year number as being reasonable.

There was some discussion about getting the two-year time by demonstrating that there is no movement into the well. Grouting and extra casing was debated. There is support for this concept of well protection when there are deep soils with very low permeabilities such as clays and some silts. With other soils, where the pathway could be down into the bedrock and through the bedrock to the well, it is difficult to calculate travel time. An expensive site specific determination would be required which is not practical for small systems.

Bruce Douglas and Justin Willis advocated for a system predicated on protecting wells and not groundwater in general. The two year time of travel concept essentially uses this concept in that it protects existing wells at the time of construction and depends on not drilling new wells within the two year time of travel area. This would require a change in thinking for the groundwater standards, which are based on a concept of all groundwater being potential drinking water. This concept might require reclassification of groundwater or a change in the groundwater standards. Justin noted that in Grand Isle people were mostly on the community water system that uses treated surface water and maybe groundwater protection would be less important. Jeff Williams mentioned that his well drilling company was working on a project where the owner wanted to build several living units but could only connect two units to the water system and therefore was drilling wells. It was apparent there would be conflicts between those that needed to use wells and those that did not.

The issue of variances was discussed. The question of what to do with requests that did not meet the rules, and whether there should be latitude to decide the proposal was equivalent was examined. The question of administering this was discussed and Roger said that the decisions needed to be made by the field people with guidance from the central office as opposed to having all variances come to the central office. Craig said that there need to be some black and white lines in order to administer a system.

The issue of whether fecal coliform treatment results can be used as an indicator of viral treatment results was discussed. While there is some difference of opinion on this, a significant majority of the literature says that there is no reliable link between the two because of the different methods of removal.

Chris asked about the pros and cons of disinfection as a method of getting offsets. Equipment malfunctions and lack of homeowner commitment could result in failure of the systems. Marilyn Davis mentioned that chlorine would be a bad choice because of environmental and health issues as well as the impact on the system itself if the effluent was not properly dechlorinated. Craig mentioned that failure of the disinfection could cause significant harm. It is not clear how effective disinfection would be for virus and cysts. David and Bruce suggested that a management scheme would ensure proper operation and the need to use disinfection supported requiring a management scheme. They mentioned that progress in remote monitoring allowed for continuous oversight and that regulatory schemes could be constructed to ensure homeowner compliance. Some people were not supportive of relying on disinfection and most people agreed that use of disinfection would present operational and oversight issues.

It was suggested that treatment levels should be specific to what was being protected. It should be different for water supplies than for other receptors.

Bruce handed out an announcement for a tour of installed innovative systems run by the Rhode Island demonstration project. It was agreed to pursue a special tour for the group and to see if this would be of interest to legislators who may be arranging a trip to the Mass. test center. A bus tour would be a preferable way to go. Bruce will make some contacts and Roger will circulate the information.

Chris wrapped up the meeting with a request that everyone pursue the points/offsets concept and return with recommendations. The proposed framework handout from David will be reviewed.

The next meeting will be Tuesday April 24, 2001 in the Appalachian Gap Room.

Those attending the meeting were

People attending

Allison Lowry
Richard Deso

Andrew Flagg
Richard Czaplinski

Gail Center
Jeff Williams

Chris Recchia
Alan Huizenga
David Cotton
Craig Heindel

Rodney Pingree
Bonnie Loomer-Hostetler
Marilyn Davis
Roger Thompson

Blair Enman
Justin Willis
Bruce Douglas