

ALTERNATIVE/EXPERIMENTAL WASTEWATER TREATMENT TECHNOLOGIES
TECHNICAL REVIEW COMMITTEE (TRC)

**The meeting was held at the Quonset Development Corporation Annex
95 Cripe Street, North Kingstown, RI**

March 30, 2011

Approved Minutes

Present: Ken Anderson, Noel Berg, Russ Chateaufeuf, Joe Frisella, Susan Licardi, George Loomis, Brian Moore, Tim Stasiunas and Dennis Vinhateiro

Absent: Dave Burnham

Others Present: Michael Schreiber, Blake Johnston and Dave Lentz, all Infiltrator representatives and Deb Knauss (DEM)

Call to Order: 8:50 AM

Materials Distributed:

- Draft Agenda for this meeting
- Draft Minutes of 12/1/10 meeting
- Draft Minutes of 2/15/11 meeting
- Summary of Infiltrator's application for their TW-series poly tanks
- Infiltrator TW-series tank cut sheet from:
http://www.infiltratorsystems.com/pdfs/TWS/TW01_Septic%20Tanks%20Cutsheet.pdf
- IAPMO certification for TW series tanks received via email from Infiltrator 3/11/11
- Excerpted RIDEM OWTS Rules 26 (septic tanks), 28 (holding tanks) and 29 (pump tanks)

Russ asked if anyone had anything to add to the draft agenda. George asked if we could talk about the importance of large systems' performance monitoring. He stated that it is important to understand what these systems are doing before issuing technology renewals. He cited the results of the Barnstable County report that shows that about 40% of systems may not be meeting their performance requirements. He also stated that because in RI some of our advanced treatment systems are followed by conventional leachfields, without a second pump (for dosing the treated effluent to the leachfield), we are not able to calculate forward flow and can therefore not make calculated adjustments to enhance these systems' treatment performance.

It was emphasized that compliance with treatment performance requirements needs to be checked carefully at the time renewal of a technology approval certification is considered. It was further stated that large systems need to be evaluated first.

Deb stated that lack of time to perform this necessary compliance evaluation is one of the reasons that she has not been able to issue renewals for the vendors who have submitted renewal applications. She reported that she had made a proposal to Russ for working on processing technology renewal applications and soliciting renewals from vendors that is based on obtaining the assistance of an intern and that Russ agreed with the terms of her proposal. Deb also reported that Jen Ryan has been compiling data on large systems' permit compliance for all systems with a design flow of 2,000 gpd and greater and for all AX-100s. This will be very helpful when work begins on processing technology renewal applications.

Russ reported that there are monitoring conditions included in the permits for all systems with design flows of 2,000 gpd and greater and that this monitoring is the responsibility of the system owner.

A summary of this large system compliance analysis will be provided to the TRC at a future meeting.

There was discussion of the issue of system O&M and the distinction between maintenance and management. There are some service providers that are doing a good job of managing systems' performance, but there are others that are performing only maintenance. It is essential that systems not only be maintained, but properly managed. Proper management includes making adjustments as necessary to maintain proper performance that meets the requirements of the technology certification and the individual permit conditions.

There was also discussion of the issue of concentrations of wastewater constituents in treated effluent versus actual loading. Often, systems are treating smaller volumes of wastewater than their design flow and the daily flow at which they were tested by NSF and MA test Center. In these cases, there can be significantly higher concentrations of BOD, TSS and nutrients in the influent; these concentrations in the treated effluent are also high and often exceed the treatment performance requirement of the technology certifications and the individual permit conditions. However,

these systems might be contributing a smaller load to the environment than others that are receiving larger volumes of wastewater and discharging lower concentrations that are certification and permit-compliant.

It was noted that technology applications have not included upper limits on influent concentrations that are necessary for attainment of the treatment capability (effluent quality) claimed in the application. It was also noted that seasonal use has not been stated as an unsuitable use for treatment systems. However, it was reported that during municipal review of some land development applications that included seasonal uses, the applicants and designers supporting the applications have stated that alternative systems will not perform well under seasonal use and therefore propose conventional systems for the seasonally used systems. It was agreed that a TRC meeting should be scheduled for careful consideration of these issues. Russ stated that it would probably not be the next meeting scheduled, but perhaps the one following that.

George suggested that it would be interesting to check with designers and see how much guidance they receive from technology vendors, when vendor review of design proposals is either required or sought voluntarily by the designer. Joe reported that OSI requires a lot of information and that they are very concerned about grease.

George reported that there is a movement toward community-scale treatment systems. Larger systems pose greater risk and without management to make necessary adjustments to maintain proper and complaint performance, we are not optimizing the treatment capabilities of these systems.

Joe asked about the FAST O&M certification program and if there is any idea of when this program might be completed, and training scheduled. Deb reported that DEM informed Bio-Microbics of their approval of the final format of the program sometime after 2/11/11 (since she had not updated the detailed notes in her technology status report on this issue, since a previous action noted on 2/11/11). Tim reported that a couple of days ago he and others in his office had received material from Bio-Microbics gauging interest in the training and stating that they are trying to target early April. He agreed to get this material to Joe. Deb confirmed that she had provided Joe's contact information to Bio-Microbics. She also provided them the names of everyone listed as registered alternative system service providers on the NEOWTP website who are associated with companies that she is aware are servicing FAST systems, and require the training to continue servicing the systems, homeowners, and others as appropriate.

Minutes of December 1, 2010

Motion: Joe made a motion to approve the minutes as presented.

Second: Ken seconded the motion.

Discussion: George asked about processing tanks and liquid level. He wanted to verify his understanding that a processing tank, such as those that are part of a treatment system, do not have to satisfy the liquid level element of the OWTS Rules. Russ verified that this is correct, and added that material specifications are carefully considered, as are performance data, but that if a processing tank does not have a liquid level of 48-inches it is not fatal to the application.

Vote: All present, who were in attendance at the 12/1/10 meeting voted in support of approving the minutes as presented. Susan abstained, as she was not in attendance at the meeting.

Minutes of February 15, 2011

Motion: Joe made a motion to approve the minutes as presented.

Second: George and Tim seconded the motion.

Discussion: There was no discussion.

Vote: All present, who were in attendance at the 2/15/11 meeting voted in support of approving the minutes as presented. Ken and Dennis abstained, as they were not in attendance at the meeting.

Other

Ken asked if the Charlestown issue has been resolved. Russ stated that DEM is waiting for revisions to be made following their receipt of the comments DEM provided.

Infiltrator TW-Series Tanks

Deb provided some quick details from the application and her summary of it:

- The tanks are all IAPMO certified.
- The IM-1060, although already approved in some jurisdictions, is not in-use and therefore, does not satisfy the minimum term of successful use for a Class Two approval, so we cannot consider it under this application.
- They all satisfy all the RI requirements except for liquid level (while the TW-900 is <1000G which is the minimum volume for a septic tank under the RIDEM OWTS Rules, the application self-restricts its proposed use accordingly to use as a septic tank in series only).
- Since the IAPMO standard includes in its scope: "*ST design shall be such as to produce a clarified effluent consistent with accepted practice and shall provide adequate space for sludge and scum accumulations.*", she is satisfied that the tanks provide necessary primary treatment.
- They have the necessary approvals to satisfy either Class One or Two approval.

- While there is no actual documentation of installation, if the tanks have been in production since 2008, she makes the leap of logic that they must be in-use and selling, or production would have been terminated.
- These tanks do not requiring filling with water at installation prior to backfilling and when pumped (they have structural bulkheads, the structure of which is better understood based on the graphic on the distributed cut sheet she found on the Infiltrator website).
- They all have flat bottoms.

George noted that pumping these tanks might be challenging, because of the vertical and cross-member components of the structural bulkheads, as well as the ribbing on the bottom of the tanks. It was acknowledged however, that there is a range of effort provided by pumpers regardless of the presence of such features, so not every tank is carefully raked clear anyway, so this should not be a defeating element of the application.

Tim suggested that if the tanks are approved, that the approval could include a statement that additional care is required when the tanks are pumped.

Noel asked what the reasoning is for a septic tank liquid level of 48-inches. Russ stated that he believes it is related to storage and not so much about efficiency of removal and that with two-compartment tanks, the 48-inch liquid level is likely not as important as it once was. Joe added that the requirement for effluent filters is an additional measure of comfort that septic tanks are retaining solids.

George asked about the conditions under which a lowboy septic tank may be used. Brian said that he doesn't see them specified on design plans anymore. Brian asked what the liquid level requirement is in the ASTM standard for precast concrete septic tanks. Deb could not recall and did not have a copy of the standard to look it up.

There was some discussion about when pumping is recommended: when solids accumulation is between 35 and 50% of the operating level (outlet invert elevation). If liquid level is less than 48-inches, the tank may require more frequent pumping. It was agreed that pumping might be required more frequently with a liquid level less than 48-inches, but if that difference is about 8-inches, the increased frequency should not be expected to be extreme. The pumping recommendation would be the same percent solids accumulation in any tank. Russ noted that the OWTS Rules specify that the minimum septic tank volume below the flow line for a three bedroom residence is 1,000 gallons and that specific volumes below the flow line for septic tanks, based on number of bedrooms and design flow for commercial uses are also specified, so even with a reduced liquid level, there is a requirement for minimum septic tank volume that must be satisfied.

At 10:25, Michael Schreiber initiated his presentation supporting Infiltrator's application for their IM-1060 and TW-series septic tanks. The TW-series have been sold for just over three years. The IM-1060 tank which already has some state approvals although it is not yet in production, will soon replace the TW-1050, which will be taken out of production May 15, 2011. He was asked about the number of vertical members associated with the structural bulkhead in each of the models. There are two in the TW-900, three in the TW-1050, 1250, and 1500. He also explained that they are 2-inch by 2-inch diameter, fiberglass construction and are secured with stainless fasteners and are spaced about 1.5-feet apart.

Only seven states have a requirement for a liquid depth of 48-inches for septic tanks; they have obtained approval in five of these and Massachusetts demonstrated an equivalent environmental protection associated with the tanks.

Ken asked if the TW-1050 and IM-1060 tanks are of comparable weight. Michael reported that because of the manufacturing process, the IM (injection molded) tank can have a thinner wall than the TW (triple-wall) tanks and is therefore lighter. Another advantage of the IM-1060, over the TW-series, from the perspective of RI's requirement for a 48-inch liquid level for septic tanks, is that the IM has a 44-inch liquid level, rather than the 39.75-inches of the TW-series. It was emphasized that all the tanks satisfy all of the RI requirements except the liquid level. Dave Lentz interjected asking if RI can consider the IM-1060 as a special case, since it is getting closer to the RI requirement, rather than farther away. Deb stated that we do not have the latitude to do that because the Rule allowing approval of a component at the level of Class Two, requires at least one year of successful use. Dave nobly debated the logic of this, since if the tank had a 48-inch liquid level and all the other attributes remained the same, it would not even require TRC review and could be placed into use in RI. While this is indeed the case, the Rule is clear, the technology program has to abide by it and there is no provision for such special cases.

Although it was clear that there could be no immediate success of the IM-1060, Michael did provide the remaining material and production information. The IM tank has a structural bulkhead with two vertical members and is manufactured in two sections, top and bottom. These are joined and fastened with locking clips of a bright yellow (contrasting with the tank, which is black or dark grey, presumably the color makes it easy to identify the presence or alternatively absence of one or more of the clips) by Infiltrator certified personnel. He explained that the tanks are vacuum tested at the manufacturing facility and that the IAPMO certification allows random audits and unannounced inspections of the manufacturing facility.

Michael's slides included summarized findings of an article published in 2005 in Environmental Science and Engineering, "Rethinking Hydraulic Flow" by Richard Lay, Max Weiss, Kris Pataky and Craig Jowett. In summary, this work reported that longer, shallower septic tanks appear to be preferable to those of shorter but deeper dimensions.

He presented a comparison of Infiltrator TW and IM tanks with Snyder polyethylene tanks, which have a 48-inch liquid depth; the travel time from the inlet to the inter-compartment wall is longer in the Infiltrator tanks than in Snyder's. Hydraulic retention time was compared and observed measurements were within 1.5% of each other and considered functionally equivalent.

Russ asked about riser configuration. Michael described the reinforcing ring to which the riser is attached with 10 stainless steel fasteners, nine of which are hex-drive and one is square-drive. Detailed installation instructions are included in the application.

Dave again emphasized that it has been documented that septic tanks with a liquid level less than 48-inches are protective of leachfield performance. He was asked if any of the tanks are HS20-rated and answered that none of these tanks are designed for traffic-use.

Russ asked if the TRC thinks that the TW-series tanks are acceptable even with a liquid level less than the required 48-inches. George commented that with a longer flow path and an effluent filter they seem acceptable. It was noted that depending on system use, a homeowner might need to be aware that these tanks may require pumping at shorter intervals than deeper tanks.

Since there seemed to be support for these tanks with a liquid level of 39.75-inches, Russ asked how the group felt about tanks of lesser liquid depth than 39.75 and at what liquid level a tank might be considered too shallow. For example in the table of states' minimum liquid level requirements, there were a couple of states reported as having a minimum of 30-inches. There was some discussion of accommodation of liquid levels less than 48-inches by increasing length, but it was acknowledged that tanks can only be so long. Everyone agreed that without supporting documentation, such as presented today, 30-inches just seems too shallow.

There was discussion about how to accommodate tanks with a liquid level less than 48-inches, demonstrated to be functionally equivalent but lacking the necessary minimum one-year of successful use, since the Rule's language is strongly phrased and clear in its limit on this issue. The only option is to change the Rule. Russ reported that a Rule change needs to be completed in the near future to accommodate the most recent tolling law and that we could attempt to incorporate a revision of the tank standard in this upcoming revision.

It was suggested that the minimum liquid level be reduced from 48-inches to 39-inches.

Tim noted that DEM has to acknowledge that as technologies improve, new products may be introduced that will do the same thing as products with which we have experience in the state, but be of an unusual configuration that may not meet the standards for shape and size.

Joe wanted to verify that all tanks are required to have two compartments and an effluent filter; Russ verified that he is correct and that the Rules also require that the first compartment be approximately 2/3 the volume of the second. Joe asked if we might consider developing a length requirement as a function of liquid level less than 48-inches, but this did not gain support.

There was more discussion of pumping, but since the same recommendation for pumping when the solids accumulation is at approximately 1/3 the operating level, everyone seemed satisfied.

Brian noted that it may not always be easy to accommodate plastic tanks in design plans: on sites where area is scarce, even a slight increase in the lateral dimensions of a tank may violate horizontal setbacks. Additionally, there will have to be some thought put into tees installed in these more shallow tanks, so that they are not in the sludge, or too close to it, as accumulation approaches the depth at which pumping should be performed.

There was some discussion about the manufacture of the IM-1060 tank in two halves, considering how there was so much interest and effort in trying to eliminate seamed concrete tanks. George reported that concrete tanks are not all monolithic even now. But it was noted that the Rules require that all tanks be certified watertight by the manufacturer or by onsite testing. There was some discussion about manufacturers' certifying watertightness on the basis of testing a representative percent of the tanks produced, rather than each individual tank and among the group, there was a range of comfort with this statistical representative testing process. It was agreed that the approval certification should include a requirement that each individual tank installed in RI needs to be individually certified (though not tested at the manufacturing facility) as watertight. Brian cautioned that we need to be consistent with the requirements for concrete tanks.

Russ asked if there is a recommendation to approve the TW-series tanks, since we may not accommodate the IM with the current regulatory language.

Motion: Tim made a motion to approve the TW-series tanks.

Second: Joe seconded the motion.

Discussion: Joe asked about substitution of these tanks for concrete tanks specified in approved OWTS permits. Ken asked about buoyancy and if DEM requires anchoring. He also articulated his concern about direction in the installation manual for the IM-1060 for installation of underdrain and interceptor trenches for short and long-term groundwater control. Russ stated that because of RI's 100-foot setback to drains, we would not allow installation of drains beneath and around the tanks. He also stated that the Rules require when a septic tank is installed where it will be in contact with the seasonal high groundwater table, floatation calculations must be performed and if necessary provisions made to prevent floatation of the tank. Use of the TW-900 tank in series as septic tanks was considered since the OWTS Rules state that septic tanks in series must be single compartment and the volume of the first tank shall be at least two-thirds ($\frac{2}{3}$) the required tank size. It was stated that since the TW-series tanks are of two-compartment design, that the TW-900 would not be able to be used in this configuration. Deb noted that when she was reading the tank specification checklists submitted for each of the models, she noted that the TW-900's checklist did not have the two-compartment box checked and thought that this model failed to satisfy two elements of the RI requirements, but then remembered that the application clearly stated that they were seeking approval of the TW-900 as a septic tank when used in series only, because its effective volume is less than 1,000 gallons. Therefore, the TW-900 is acceptable for use in series to function as a septic tank.

Vote: All voted in favor of approving the TW-series tanks.

It was requested that the certification include language prohibiting the installation of subdrains beneath and in the vicinity of the tanks and that the inlet and outlet connections must meet the requirements of OWTS Rule 26.5.3: "*inlet and outlet pipes shall be connected to the tank with a watertight sealed flexible joint. The pipe gasket shall be an integral part of all tanks and the pipe gasket shall be fastened to the pipe with a stainless steel retractable clamp.*".

The certification needs to include the following:

- Prohibit installation of subdrains; there is such direction in the IM-1060 installation manual.
- The inlet and outlet connections must meet the requirements of Rule 26.5.3.
- Use of the TW-900 in series is acceptable.
- Note that these tanks may not be compatible with some approved AE technologies.

Joe wanted to know if we can change the rule to accommodate use of chambered tanks in series. Russ stated that we can revise this rule, but that we need to get this next revision completed and through the process quickly, so we need to limit the amount of content revised.

There was additional discussion about revision of the septic tank liquid level requirement. Russ summarized that the group agreed that 31-inches seems inadequate but that based on the calculations presented by Infiltrator today, 39-inches seems to provide adequate depth, settling, retention and travel time and that in recognition of this and RI's requirement for two-compartment tanks and effluent filters, we can accept a liquid level of 39-inches for septic tanks. Noel agreed that 39-inches is a reasonable liquid level for septic tanks based on the evidence presented today.

Someone asked about how liquid level and tank dimensions may affect interfacing of these septic tanks with other components, with consideration of vault height and the piping in the various approved AE technologies. Russ stated that the certification will need to include a note that these tanks may not be compatible with some approved AE technologies.

Russ asked if anyone wanted to make a motion concerning revision of the liquid level Rule for septic tanks.

Motion: Susan made a motion that the TRC recommend to DEM, revision of the requirement for septic tank liquid level, from 48-inches to 39-inches.

Second: Joe and Tim seconded the motion.

Vote: Ken opposed this motion based on concern about settling and solids accumulation and re-suspension. Everyone else in attendance voted in support of the motion; with majority support, the motion carried.

Technology Program Status Report

Russ updated the group on technology application and approval status. Since the last TRC meeting on February 15, there are still two technologies for which TRC approval was obtained, but the certifications have not been written; these are still the PercRite drip system and ARC chambers. Russ explained that due to the amount of additional work that needs to be done with vendors to get manuals in place and training scheduled, that we need to delay the date of the next meeting a bit beyond one month from today to give Deb a chance to try to catch up and suggested the end of May. The group considered options and settled on May 18, pending availability of the QDC Annex.

The balance of the technology program update is as follows (as of the start of this meeting).

There are currently:

7 expired certifications;

4 Expired certifications for which renewal has been applied;

2 certifications that need to be written (PercRite and ARC Chamber)

1 application that needs to be reviewed by TRC (Infiltrator tanks); at the conclusion of the meeting this gets added to the certifications that need to be written, for a new total of three.

Clarus's Fusion Treatment System Application

It was asked how the proposed revision of the rule regarding septic tank liquid level affects the application for the Fusion treatment system. Since Fusion is a processing tank and not a septic tank, liquid level is considered differently than for a septic tank, as part of the whole treatment system and with careful consideration of the effluent quality as indicated by the performance data submitted. Deb updated the group on the issue of the Fusion tank's material specifications and her communications with Wes Combs who has in-turn been in communication with Fuji Clean. The tank satisfies all of the elements of the IAPMO standard except the section regarding fillers. Deb did a quick bit of research on plastics production following the most recent update from Fuji Clean and discovered that their use of filler is common and imparts positive attributes to the finished product. She emailed Wes seeking a letter from Fuji Clean stating that the current formulation has been in production long enough that the units manufactured using this formulation can be expected to have been in use for at least one year and also if the Finite Element modeling that was reported in the Fusion application submitted to RIDEM, was performed for tanks that were being made with the current formulation. She stated that the current situation in Japan has been slowing communication down, but that Fuji Clean has been responsive and helpful.

Next Meeting

The next meeting was scheduled for May 18th at 8:30 AM, pending availability of the QDC Annex.

Adjournment

Motion: George made a motion adjourn.

Second: Joe and Ken seconded the motion.

Discussion: There was no discussion

Vote: All present voted in support of adjourning.

The meeting adjourned at 12:20 PM.