

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

The meeting was held at
95 Cripe Street, North Kingstown, RI

February 14, 2013

Approved Minutes

Present: Nikki Andrews, Russ Chateauf, George Loomis, Tim Stasiunas and Dennis Vinhateiro

Absent: Ken Anderson, Noel Berg, David Dow and Susan Licardi,

Others Present: Blake Johnson (Orenco Systems, Inc.), Bob Johnson (Atlantic Solutions, Inc., Orenco Systems, Inc. distributor), and Deb Knauss (DEM)

Others Present via Conference Call: Jason Churchill (Orenco, Inc.)

Call to Order: 8:57 AM

Materials Distributed:

- Draft Agenda for this meeting
- Draft Minutes of 1/11/13 meeting
- Two emails from Jay Prager (Maryland Department of Environment [MDE]), responding to Deb Knauss regarding MDE assumed influent TN of 60 mg/L
- MDE Bay Restoration Fund Ranking Documentation 2012
- Summary of material submitted by Jason Churchill via email 1/17/13, in support of AXRT Series application, in response to Russ's request
- Emails from Jason Churchill (1/17/13), and attachments
- Draft Class Two N-removal Technology Approval for Norweco, Inc's Singulair TNT and Green TNT
- Two versions of the Draft monitoring requirements for N-removal technologies approved under 37.4.2 (B)(i) and (ii): one incorporating the comments from URI (although they still appear as "comments") and one as it was received from URI
- The example Advanced Enviro-Septic leachfield and Eljen leachfield for comparison

Review of Draft Minutes of January 11, 2013

- Page 1, at the third bullet beneath "Materials Distributed", replace "fro", with "for": "...submitted **for** approval for use in the Bay Restoration Fund program ..."
- Page 1, at the final bullet beneath "Materials Distributed", add close parenthesis.
- Page 1, at the sixth bullet beneath "Review of Draft Minutes of November 30, 2012", the page number should be 3, not 2.
- Page 1, at "Vote" beneath "Review of Draft Minutes of November 30, 2012" add "and" between "November 30th" and "voted".
- Page 2, at item 1) beneath "Russ explained that there are two issues..." in the last sentence, change "14.g mg/L TN" to "14.6 mg/L TN".
- Throughout the draft minutes, all citations of "OSI" need to be revised to "Orenco Systems, Inc."

Motion: Tim made a motion to approve the minutes with the corrections noted.

Second: George seconded the motion.

Discussion: There was no discussion.

Vote: All present were in attendance at the meeting January 11th voted in favor of the motion; Nikki and Dennis abstained.

Confirmation of receipt of the technology application for The Nibbler

All confirmed receipt of the application for The Nibbler.

Orenco Systems, Inc. AXRT Series (AdvanTex)

Background: This nitrogen removal technology application was submitted under Rule 37.4.2 (B) (ii) (a new provision of the OWTS Rules effective date 7/9/12). This rule provides for a nitrogen removal technology to be considered for Class Two approval based on an approval received in another state where the climate is similar to or colder than Rhode Island's and the technology review criteria is substantially equivalent to RIDEM's Class One or Class Two. Substantially equivalent review means the other jurisdiction has a minimum nitrogen reduction standard of fifty percent (50%) reduction in total nitrogen concentration and a maximum effluent total nitrogen concentration of nineteen (19) mg/L and the review process evaluates performance data with respect to a technology performance claim made by the vendor. Orenco Systems, Inc. is using the approval received from Maryland Department of Environment (MDE) to support their application to RI.

Jason Churchill (Orenco Systems, Inc.) phoned in at 9:05. Russ explained that the issues we need to consider are:

- under which Rule to approve the AXRT Series,
- when Maryland changed their N-removal standard, and
- the configuration of the AXRT systems installed in Maryland and monitored under the BAT program, which is the data submitted to RI in support of this application.

Based on the material Jason submitted via email, Maryland acknowledges the new configuration for which RI approval is sought. The data submitted supports the claim that operation and treatment are substantially equivalent to the original AX configuration and we are now comfortable with the new AXRT configuration for which RI approval is sought.

The Maryland standard at the time the AXRTs were approved and installed in Maryland, assumed an influent TN concentration of 40 mg/L, but it was later changed to assume an influent TN concentration of 60 mg/L. The Maryland treatment standard in effect at the time of the approval required a maximum treated effluent TN concentration of 20 mg/L with 80 percent of the systems meeting this performance. Our treatment standard is 19 mg/L TN, with systems' averages meeting this, which is statistically less stringent than the Maryland standard. The average treated effluent TN concentration for the AXRTs installed in MD is 14.6 mg/L. This is better than the minimum performance required under the RI Rules, therefore, we believe that we may approve this technology under the Rule under which approval is sought.

The TRC has been discussing monitoring technologies receiving Class Two N-removal approval under the two new provisions in the OWTS Rules. This has been discussed in the context of Singlair TNT, (since this was the first N-removal system approved under the new Class Two N-removal provisions in the 7/9/12 OWTS Rules). We need information on forward flow so when we look at the data and see abnormalities, we can assess if there was a high or low influent load and understand the concentration in the context of load. It is important to have this information for better understanding of the treatment performance of a system. Russ is recommending this testing for the AXRT as well as Singlair TNT. Typically, the testing (required under a Class Two approval) is three systems for two years, which generates 24 data points. This new protocol will provide 40 sampling points. He doesn't think that it will be too much additional work to obtain this. We want to require this of all N-removal systems as they are approved in RI and to N-removal technologies that are not compliant with the reporting requirements of their certifications when they apply for renewal.

With regard to currently approved technologies, RIDEM would like to develop a testing program with Clean Water Act Section 319 funds, to obtain data on systems that are already installed and being used. Applying these funds to and implementation of such a project is under consideration at DEM.

Jason asked how many systems are approved under this new Rule. Russ explained that Singlair TNT is the first application that was submitted and approved under subsection (i) [of the new Rule], and the application for the AXRT was submitted under (ii). AXRT is the first application received under (ii). We are contemplating requiring this sampling protocol of the Singlair TNT.

George asked how many of the AXRTs will be sampled under this new monitoring protocol. Russ explained that the sampling will provide 40 data points, with homes occupied year round being sampled quarterly and seasonal homes being sampled twice per year (season).

Bob Johnson asked if water billing records would be sufficient to fulfill the requirement for information on forward flow. Russ explained that these records would not provide accurate information on sanitary flow.

Jason asked how many AdvanTex systems in RI have pump discharge. Bob stated about 95 percent of them (this is approximately 3,800 systems). Bob answered Jason's question about whether meeting this requirement presents an obstacle; if 95 percent of the AdvanTex systems in RI are pump discharge, meeting the requirement for forward flow doesn't appear to be an obstacle. Note: It was noted during review of these minutes in draft form at the TRC meeting March 14, 2013, that 5% of 3,800 systems (5% being the number of AdvanTex systems installed with out a discharge pump), is not an inconsequential number of these systems for which we don't know forward flow through the system and for which we can't calculate recirculation ratio based on forward flow, to optimize N-removal performance.

Motion: Tim made a motion to recommend approving the AX RT with the monitoring provisions discussed.

Second: George seconded the motion.

Discussion: There was no discussion.

Vote: All present voted in favor of the motion.

Review of RIDEM N-removal standard of minimum 50% N removal and 19 mg/l: update following meeting with MASS DEP and George Heufelder

Russ reported that George Heufelder agrees that TN concentrations (in influent received by advanced treatment systems) are higher than 38 mg/L, but he also thinks that they tend to be lower than the concentrations cited in the WERF and Wakulla reports (60-70 mg/L), that MDE consulted when they were considering revising their nitrogen standard. MASS DEP doesn't see any need or benefit to changing their N-removal standard, so they don't anticipate doing so.

Russ explained that MA currently has three technologies with general use approval for N-removal: FAST, Ruck and recirculating sand filter, which is a generic technology.

In MA, DEP has no nitrogen removal requirement, they have a nitrogen loading limit associated with lot size and if proposed wastewater flow exceeds the maximum for the parcel, use of a nitrogen removal system will allow higher flow than if a conventional system were proposed. However, on Cape Cod, and in areas of other N-sensitive receptors, the municipalities may have nitrogen standards, and local authorities apparently accept provisional N-removal approvals for the purpose of meeting their standards. Data is provided by O&M providers to George Heufelder's office (Barnstable County Health Department), where it is analyzed and then provided to the municipalities. This is funded by a fee that is paid by homeowners (\$50 per system), to the service providers, and then paid to the Barnstable County Health Department. This funding provides for a staff person to help manage the onsite program and to follow-up when data are not provided, or service contracts are cancelled or not renewed.

Norweco, Inc. Singulair TNT and Singulair Green TNT (N-removal) Draft Class Two Certification and Draft Monitoring Requirements

The monitoring protocol needs to be carefully thought through. Russ explained that he was made aware of AdvanTex O&M reports that identified lack of a telephone line connected to the system for telemetry, as a deficiency in installation. He asked why this is coming up at the time of a system inspection. If we're requiring it, it should be covered in the approval certification and in all the technology guidance documents and it should be incorporated when the system is installed; this can't wait until the system is in use. The homeowner should know before the first inspection that a phone line to the system is a system requirement. However, Russ considered, "Are we going to require this?" We don't know that all homes have the capability to accommodate this, since people are deciding to forego landline telephone connection, in favor of mobile communication devices. We should be consistent and require it, or not, and the homeowner should be told before the system is installed, if it is required.

George explained that some technologies are marketed, citing telemetry as an advantage, providing a certain robustness and he explained that telemetry may be connected using a landline, or over the Internet.

A phone line is about \$30 per month, so using landline telemetry adds \$360 per year to the operating cost of a system.

Russ said that the requirement for telemetry should be in the technology approval certifications. If a system doesn't have it, or doesn't require it, we won't require it. If telemetry is intrinsic to how a technology operates, we want it installed. Russ wants to propose that we handle this issue in this manner in the future.

Bob Johnson explained that Orenco, Systems, Inc. doesn't require telemetry; it is part of the panel capability. But it is a benefit and they don't encourage not using it. More than 25 percent of homes don't have a phone line to the home, they are seasonal, or they use cellular service.

Russ re-emphasized that AdvanTex O&M reports cite absence of a phone line for telemetry, as a deficiency.

Bob explained that it is to the benefit of the homeowner to have the telemetry capability connected, because the service provider can troubleshoot issues over the phone and save a service call.

Jason explained that telemetry whether it is required, or not required, they strongly, strongly encourage it. Some people have no landline. When the vendor wants telemetry, require that there is a telemetry-capable control panel.

Check with TNT to see if telemetry is required and if so, include it in the approval certification and if it is optional, leave it out. Russ asked if there are any other issues or questions about the approval certification, or any other questions.

George wanted to make sure that the same sampling needs to be required for Norweco, Inc.'s Singulair TNT; he wants to make sure we are consistent.

Monitoring requirements

Russ explained that one of the issues that remain to be clarified is when to require that a system be resampled for the additional parameters. The standard requires that treated effluent not exceed 19 mg/L TN, some days a system will be discharging effluent with a TN concentration of 14 mg/L and other days 24 mg/L. Is this considered non-compliance, therefore requiring additional testing for the additional parameters? With two observations, and an average of 10 mg/L, the system meets the standard. He is not sure how to approach this issue. If a system has a design flow of 2,000 gpd or greater, we have a requirement that if it is not in compliance it must be re-tested; this can be dealt with on a case-by-case basis. If for two consecutive quarters effluent TN concentrations are greater than 19 mg/L then resampling could be required. But there is still the water use and loading issue to be considered.

George stated that we have discussed development of a three-legged state standard: TN concentration, percent reduction, and N-loading. Some homes with low carriage water produce high TN concentrations while everything else reported is in the proper range. To consider a case like this, we could do a N-loading calculation and compare the result to an established loading threshold based on bedrooms. If the TN loading is less than the threshold, with concentration outliers that are greater than the threshold of 19 mg/L standard, it is still a complying system. We need to acknowledge that homes using

very little water may be contributing less nitrogen to the ecosystem than some systems that met the standard for all of the quarterly sampling events and not chastise homeowners for using low carriage water and being good stewards of water conservation.

If a system is out of compliance on TN concentration and is producing a high volume of wastewater, it is out of compliance with the certification and that system requires attention. This is why we need a pump or other method of recording forward flow to be able to establish whether a system is in or out of compliance and to calculate recirculation ratio, where applicable. Moore has brought up the idea of operating permits that get renewed annually if the system is in compliance and not renewed if the system, is not in compliance. 19 mg/L with 345 gpd, loading is a fair way of dealing with this. George stated that we could establish our threshold as 19 mg/L and 345 gpd, for three bedroom homes. He noted that this is high water use; no system should be receiving influent at its design flow. If it is, then the peak flows will exceed it. We can establish the threshold using gallons per day associated with number of bedrooms, based on design flow according to OWTS Rules and percent of design flow, maybe 65 or 70 percent. Russ stated that average water use is 65 gallons per capita per day. Russ agreed that this is a reasonable approach. If we assume water use of between 60 and 90 percent of design flow and multiply thorough to 19 mg/L, we have our N-loading threshold for a home of the applicable number of bedrooms. If the treated effluent TN concentration is lower, the system is in compliance. George asked if this is a rational proposal for Permitting. Brian said that we can't permit based on use (so any considerations based on occupancy either number of occupants or seasonal versus year-round occupancy, won't work), but it can be used for technology compliance.

Tim asked how this would be implemented. George expects that it will be applied mostly with residential systems. Tim is concerned about this being a difficult financial burden for some families. He described a situation where a family borrowed \$25,000 for their advanced treatment system. O&M costs between \$250 and \$300 a year, and if their system was in the pool to be sampled, they'd be charged for the additional visits for the sampling and the analytical. This is not an insignificant burden in addition to a mortgage and taxes for people who are just getting by.

A fourth leg of the standard, in addition to TN concentration, percent reduction, and N-loading, could be lot size. With more land area, there is more dilution and a greater nitrogen load could be accommodated. This may benefit some homeowners, and N-loading is going to help us understand this issue.

Russ stated that RIDEM will include loading calculations as discussed this morning, in the draft monitoring requirements. Since we shouldn't require additional testing just because one nitrogen concentration is greater than 19 mg/L, in an effort to resolve this, we'll include calculations and use a range. For example: at about 58-percent of design flow, 200 gpd would be used at a typical three-bedroom home (or maybe account for a range of percents of design flow), and when at least two data points are available, require additional testing if the average of at least two TN concentrations, results in an exceedance of the specified maximum loading.

George suggested two consecutive readings. If the average of two samples' TN concentrations is 25 mg/L and the carriage water is in the 160 to 180 gpd range, this indicates to him, the system is not working properly and the system requires adjustment. Who is responsible for the adjustment, and who is charged? The vendor has a responsibility to ensure the system is monitored to be working correctly to meet the treatment requirements. George thinks this adjustment should be the responsibility of the vendor, as part of their responsibility to prove that the technology is working correctly.

Russ said that the vendor has a responsibility to get the system performance information and that close coordination between the vendor and O&M providers is necessary for this to happen. In Massachusetts, all the O&M providers have a treatment plant operator's certification. RIDEM has thought about whether we need to do this, and how this might be implemented. This is a way to encourage accountability among O&M providers. George noted that based on his experience that this certification alone, does not indicate sufficient ability to operate AE onsite systems.

Russ explained that an advantage of the monitoring protocol we are developing is that it has a beginning and an end date (based on fulfillment of the submission of 40 samples, as required by the terms of the protocol). It will not be permanent. We will propose it this way and make it clear when additional testing must be done: based on forward flow, nitrogen concentration, and calculated N-loading (using 60-70% of design flow) after the second sample is reported. Russ said that water use in his home is consistently 65 gpd per person.

Russ said that we will assume seasonal use; if a home is going to be occupied year-round, they will have to tell us. A maximum of 50 systems may be installed until the monitoring is completed and the technology is declared to be performing to the N-removal standard. Brian asked how we will manage this protocol and the required coordination with designers; he anticipates a coordination gap. How are we going to manage selection of homes for monitoring some number of year round occupied systems and some number of systems that are occupied seasonally to acquire a total of 40 data points?

George stated that in Barnstable County every system is sampled quarterly forever, with the cost paid by the homeowner. They use private service providers to do this and it is all reported to the Carmody online data management system and disseminated to Barnstable County. The Carmody system is available in RI and could be augmented to manage the monitoring. A third party will monitor the systems and in this case they will be working for the state and not the

homeowner. Some towns could do this using the Carmody system (since it is already being used in several municipalities). Or the state could adopt and adapt the Carmody system. The municipalities, service providers and the state could sit down and talk about this.

Russ said that George Heufelder spoke about developing a management tool that could be used instead of the Carmody system and that he would share it with us. George stated that when an employee left a municipality that didn't use the Carmody system, the municipality had some trouble with continued implementation of the program because of its reliance on institutional knowledge. The Carmody system was initially offered in RI for \$100 per municipality, with the capability to be modified to suit the municipalities' needs. \$100 is not a lot of money for a robust management system and he's not sure that it is still available at the same cost. Jamestown, Charlestown, North Kingstown, and Tiverton use it, and maybe a couple of others, too.

Jason Churchill (on the phone) reported that there are other programs available for managing this kind of reporting based on O&M tracking. "Online RME" is offered by Orenco Systems, Inc. principals. It is a user-funded system, into which a service provider enters data for a nominal fee; it requires no resources of the regulatory agency. He would like to provide Russ more information on this after the meeting.

Russ explained that whatever program we may wish to use, needs to be presented to State Purchasing and clear a rigorous review process. We were not able to use the Carmody system because it uses advertising and this is prohibited in the RI state system. Russ is hopeful that George Heufelder's system will be approved by the state purchasing system. Still to be considered however, is how it will be funded. George Loomis's point about encouraging municipalities to manage monitoring is a great idea, but funding is an issue. George suggested that whatever program is adopted, it could (probably) be made available with firewall access, without buy-in access.

There was no other discussion of the Singlair TNT, or the proposed monitoring requirements for N-removal systems approved under the two new Class Two provisions in the OWTS Rules.

Presby Environemntal, Inc. (PEI) Application for Advanced Enviro-Septic (AES) for TSS & BOD Reduction

Russ explained that via email, Dennis Fogg of Presby Environemntal, Inc. (PEI) explained that PEI decided to withdraw their application for Advanced Enviro-Septic. With consideration of the design parameters presented in the draft certification, they decided it wasn't worth developing a market in RI. Russ stated that he had thought more about this and wants to discuss an alternative AES leachfield configuration with the TRC before offering it to PEI.

PEI allows two pipe trenches, which are like a small bed. The design that we approved is one pipe per trench with 4.5-foot center-to-center trench spacing; the pipes are surrounded by six-inches of sand (PEI specified system sand, which is essentially ASTM C-33 sand). Russ was thinking that other leachfields approved in RI apply 7 square-feet per linear foot, which is more than the 2.3 square-feet linear foot that AES is loaded at, as proposed. Deb explained that she used a volumetric comparison of Eljen and AES. Each Eljen unit is 3-feet wide by 4 feet long by 7-inches high and AES is a 10-foot pipe with a 1-foot diameter; she considered the volume of water (based on volume of each unit as determined by their dimensions) on the footprint of each of the units.

Russ suggested that we look at another option: use 4.6 g/lf and increase the separation between the trenches, with a two pipe trench and present this to them.

There was discussion of how AES can be considered to be like a low rate sand filter. But in RI bottomless sand filters receive treated effluent and are pressure dosed, while AES receives septic tank effluent and may not be pressure dosed. And while GeoMat 39 is used with two lines on the mat, it is receiving treated effluent and Eljen has greater surface area. George considered oxygen diffusion down to the middle of the trench and the fact that we're not using the serial distribution option (each line will receive gravity flow) and stated that he doesn't have a lot of anxiety about two pipes per trench any more. Russ asked if there was a recommendation to approve the alternative configuration he proposed today and go forward if PEI agrees. The TRC concurred.

Motion: Dennis made a motion to approve DEM advancing a Class Two leachfield component approval for AES, as described by Russ, if PEI accepts the alternative leachfield discussed today.

Second: Nikki seconded the motion.

Discussion: There was no discussion.

Nitrex Update: Nothing new on Nitrex.

Next Meeting and Adjournment

The next meeting was scheduled for March 14, 2013 pending availability of a meeting venue; no other issues were introduced for it.

10:54 AM adjournment.