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

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

May 22, 2012

Approved Minutes

Present: Noel Berg, Russ Chateauneuf, Susan Licardi, George Loomis, Nikki Schultz, Tim Stasiunas and Dennis Vinhateiro
Absent: Ken Anderson

Others Present: Don Bach, Norweco, Inc., Whitney Frost, Septic Preservation RI, Inc., Brian Moore and Deb Knauss (DEM)

Call to Order: 10:15 AM

Materials Distributed:

- Draft Agenda for this meeting
- Draft Minutes of 4/24/12 meeting
- May 3, 2012 letter from Deb Knauss to Don Bach
- Cover letter from Don Bach of Norweco, Inc. with AE technology application form for Singulair TNT, Maryland data and NSF 245 Report for Norweco, Inc.'s Singulair TNT
- Brief summary of the data from the NSF Report for Singulair TNT (TNT is the 60 minute on/60 minute off aeration protocol for N-removal)
- Presby Environmental, Inc. technology application for Advanced Enviro-septic (AES) Wastewater Treatment System
- List of systems with NSF/ANSI Standard 245 Certification
- Summary of Standards' 40 and 245 treatment requirements
- Partial summary of Standard 245 system's TN results

Review of Draft Minutes of April 24, 2012
On Page 1, Dennis Vinhatiero's name is erroneously listed among members present.

On Page 2, (third paragraph beneath Nitrex update) in the sentence that begins "*It is not known if…*", edit as follows: "*…, nor is it known…*"

In the same paragraph, edit the sentence that begins: "*George explained…*" edit as follows: "*…biofilm development in the PSND or BSF pressure laterals lines…*":

In the same paragraph, edit the last sentence as follows: "*…; this could result in localized ponding.*".

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 who were in attendance at the meeting April 24th voted in favor of the motion.

Norweco, Inc. Technology Application for Singulair 960 TNT and Singulair Green 960 TNT for nitrogen removal
The application is for a Class One approval, but the material submitted does not fulfill the requirements for Class Two, nor does it fulfill the requirements for a Class Two application. However, the proposed OWTS Rules on which a public hearing was held May 3rd, are expected to be promulgated with Rule 37.4 as-proposed. The proposed Rule change accommodates submission of a NSF/ANSI Standard 245 Report with a preponderance of the effluent TN concentrations less than 19 mg/data, to fulfill the data and approvals element of a Class Two nitrogen removal application. Deb sent Don Bach, a letter May 3rd explaining this and identifying additional information that needs to be submitted even with consideration of the simplified application process that would be afforded by promulgation of Rule 37.4 as proposed.

Don Bach of Norweco, Inc. distributed bound material titled ""Rhode Island Application: Singulair Model 960 TNT and Singulair Green Model 960 TNT for Nitrogen Removal", dated May 22, 2012. He explained that Norweco, Inc. is requesting a nitrogen removal approval from RI for Singulair 960 TNT and Singulair Green 960 TNT, based on the anticipated new Rules. He understands that there is some risk that the Rule might not be promulgated as-proposed and that if this is the case, he understands that his application and today's presentation is lacking. The state approvals that were not provided with the first application that was sent to RI in two installments in April are included in the material distributed this morning. He explained that the data from Maryland were provided by a third party, Chesapeake Labs, Inc. in Maryland, which is certified by the USEPA.

He explained that Singulair TNT (both concrete and plastic) use only one pump, therefore it is less costly to purchase and to operate than other nitrogen removal systems that require recirculation of effluent to denitrify; Singulair TNT uses a 60-minute on and 60-minute off non-adjustable aeration setting to denitrify.

Russ asked Don if Norweco obtains RI approval for nitrogen removal for the 960 TNT, what would happen to the existing approval issued to Siegmund Environmental, Inc. (SESI), for nitrogen removal. Don responded that there would be two different RI Singulair nitrogen removal approvals. Deb recalled however, at the TRC meeting last September attended by both Don and Hollister Siegmund of SESI, when Hollister was asked if he would withdraw the SESI nitrogen removal approval if Norweco obtained RI approval for Singulair TNT, he replied that he would. The distinction between the two systems is that the SESI system recirculates the effluent and the Norweco TNT uses a 60-minute on and 60-minute off aeration setting to accomplish nitrogen removal. Russ asked Don to speak with Hollister about this. Don agreed to do so and stated that Hollister is aware of Don's attending the meeting today and is supportive of his purpose.

Russ was not able to find an approval letter from Massachusetts Department of Environmental protection (MADEP) in the material Don provided this morning, although he did find a letter from MADEP dated December 9, 2010 confirming receipt of an application from Norweco, Inc. requesting a modification of the existing Remedial Use approval with the addition of Singulair Green TNT. Don wasn't able to state with certainty if a letter granting the requested modification to the Remedial Use approval had been received. Russ explained that a MADEP Remedial Use approval authorizes installation of the subject system for repairs only and not for new construction.

Russ asked if Singulair TNT is approved in Maryland because he couldn't find a letter of approval from Maryland in the application material. Don stated that it is. Russ asked Don to follow-up by providing approval letters that were not included in the application material provided this morning. Don agreed to do this.

Brian Moore asked about the relationship between Norweco, Inc. and Siegmund Environmental Services, Inc. and an explanation of the company's policy authorizing distribution Norweco Singulair treatment systems. Brian explained that DEM had received a letter from SESI concerning the sale of a Singulair Green unit by an entity other than SESI. Don stated that SESI is Norweco, Inc.'s RI distributor and Bob Frost is their CT distributor, but that US law prohibits a vendor from stating where a distributor may sell the product. He explained that such competition between distributors can result in a lower cost to the customer. Norweco, Inc. does require that distributors service what they sell and if a distributor goes out of business, or dies, Norweco, Inc. will be responsible for that distributor's systems and will provide a qualified service provider to service the systems. He explained that service providers are trained by the distributors who provide a certificate acknowledging the training. Service provider training is also available generally monthly, at the Norweco factory in Ohio, at no cost, following which a certificate is also issued.

It was not known if the system sold by Mr. Frost was for TSS and BOD reduction (this certification is issued to Norweco, Inc. as the vendor and names SESI as exclusive distributor), or for nitrogen removal, which is issued to SESI as vendor and distributor, with no use of the term "exclusive distributor", but cites Hollister Siegmund, company president, as the contact). Russ stated that regardless of the type of Singulair system (TSS & BOD, or N-removal) purchased from Mr. Frost and regardless of whether the exclusivity of another distributorship was violated, SESI has a responsibility to train and approve installers and designers and a primary question to be answered is was Mr. Frost authorized to install the system. Deb couldn't remember if she had seen his name on any of the training rosters from SESI, but she will look this up. (Post meeting follow-up: Robert Frost and Robert Frost, Jr. who is the installer of record for the subject system both attended Singulair training offered by SESI January 18, 2012 and the repair application was received at RIDEM in February 2012).

Don stated that while competition can benefit the consumer, he is concerned about conflict between distributors but that he has no legal authority to resolve it or to restrict their marketing and sales activities by geographic location and this is an issue between Mr. Frost and SESI and he understands and accepts RIDEM's statement that regulating distribution of technologies they approve is not with in their authority.

Brian Moore asked exactly what Norweco, Inc. does control. Don responded: training, service, maintenance, and the quality of these activities and the record keeping of the distributors and service providers. Don explained that NSF requires that vendors of systems certified to standards 40 and 245, to maintain listing as such, audit 10% of their distributors of NSF certified systems annually. NSF audits about 2.5% of distributors of certified products. Once annually, Norweco goes out and does a structured NSF audit to an NSF protocol. They account for what is installed and where. They review files and visit three installed systems. They are required to report to NSF, any non-compliance item as written on the NSF form. Norweco has a commercial contract with each of their distributors, all of which are factory trained. Norweco may cancel these commercial contracts if there are complaints from homeowners or regulatory agencies, about a distributor not performing as they should.

Deb asked if Norweco, Inc. obtains a nitrogen removal approval for Singulair TNT in RI, would they agree to not including the term "exclusive" distributor on the certification? Don responded that they would. He explained that he thought that listing exclusive distributors was standard practice in RI and that he didn't intend or expect this to cause any

problems. Deb explained that use of the term "exclusive" is a deviation from the practice of listing distributors or local contacts on certifications and this is why she was insistent on getting this request from Norweco, Inc. and agreement to it from SESI, in writing.

There was some discussion about why there would be a CT distributor for Singulair since CT Department of Public Health (CTDPH) hasn't issued state approvals for alternative treatment systems. While they allow alternative systems to be used on a town-by-town basis as approved by the local departments of health, no system installations have been approved by the towns, so there is a CT distributor in place with no practical market in CT. Don explained that they are prepared to serve Old Saybrook when that town implements a program allowing alternative onsite wastewater treatment.

Brian Moore explained to Don that with more than one distributor, issues associated with the certifications' requirements for reporting to RIDEM are more complicated and he wanted Don to be aware of the responsibility as vendor to ensure distributor compliance with RIDEM certification requirements. He also expressed concern about continuity of service for the systems into the future when current service contracts expire: will each of the distributors be willing to service systems sold by the competitor? He also asked about additional service providers: are there others, who are they and if there are not, who will train them?

Don explained that the purchase of any NSF Standard 40 system includes four service visits, delivered as two visits each year for the first two years of ownership. After this first two-year interval, all distributors are obligated to offer a service contract under their commercial contract with Norweco, Inc. After two years, he expects that both distributors will be mailing homeowners seeking the service contract and there may be competition between the two entities. Don agreed that in issues of competition and conflict, he, not DEM would fulfill the role of referee.

George asked Don to describe the treatment train of the Maryland systems for which the data were provided and from where were the influent and effluent samples obtained. Don explained that there is a sampling box installed before the first compartment.

Don explained that systems can be installed with a telemetry option that notifies the service provider, or even to the regulatory agency, of alarm conditions by telephone or internet. He asked if this is something that we may see value in. Deb explained that Laszlo (Siegmund, of SESI) had explained the telemetry option, but if telemetry is not required of all treatment systems approved in RI, he didn't want to request that it be required with the Singulair system and therefore telemetry is currently an option with Singulair in RI and not a requirement.

Russ explained to Don that although Norweco, Inc.'s application to RI for a nitrogen removal approval for Singulair TNT cites 68% removal, RI recognizes two categories of nitrogen removal approvals, 50%, with treated effluent TN concentrations of 19 mg/L or less, and 75%, with treated effluent TN concentrations of 10 mg/L or less. So, we will be evaluating the technology under the 50% TN removal standard and not the 68% TN removal claimed in the application. Don explained that 68% is the TN removal cited in the NSF 245 report and that is why Norweco cites this, but he did not object to the RI 50%.

Proposed Regulatory Changes to Address Concerns of South County Towns

Russ reported that the public hearing for the proposed OWTS Rules was held as scheduled on Thursday, May 3rd and that DEM is considering the comments that were received on these proposed Rules. No comments were received from South Kingstown or Westerly. But Charlestown submitted comments, which were to see the attached comments submitted by Dave Potts of GeoMatrix, LLC. Some of these comments were not applicable because they were addressing issues in an earlier version of the draft Rules and not the version that was issued for public notice. So, DEM needs to talk with Charlestown about this, in case the Rule change, as it was ultimately proposed for public notice is not consistent with what they want to see as a result of the process.

An issue in Dave Potts's comments is the proposed experimental technology application and requiring three systems at a minimum. Our objective for approving use of a technology under the experimental review process is to better understand how a system performs under actual use conditions. While three may be criticized as too few, it is a better data set for consideration of system performance than a single installation, or even two of them. It isn't clear why Charlestown would agree with reducing the number of installations authorized under the experimental application to one, because of the number of homes in their town that are in need of upgrade under the municipal cesspool phase-out and this process wouldn't contribute to the solution of quickly providing a more economical nitrogen removal option for these residents.

The original purpose of the experimental technology application option was to provide an opportunity to vendors of a new technology for which they did not have the required approvals and performance data for a Class Two approval, but for which there was enough information available to suggest that the system should perform to the RI standard and the vendor's claim. It was expected that these vendors would monitor these systems and compile performance data with the objective of obtaining the necessary support for a RIDEM Class Two approval. The requirement for proposing three to ten sites at which to install the subject system is an important element of the experimental technology review process and

Russ prefers to retain this part of the rule as written and not allow an experimental system to be installed and evaluated at any less than three sites. Russ stated that DEM wants to review this with Charlestown and explain why DEM doesn't want to make this change to the experimental technology application process.

Russ reported that DEM also received a letter from Orenco Systems, Inc. (OSI). They object to allowing NSF/ANSI Standard 245 as proposed, because the influent nitrogen in the test is low and it is therefore easy to achieve the required 50% total nitrogen removal and treated effluent total nitrogen concentration of 19 mg/L or less.

Since the group had before them the Standard 245 report for Singulair TNT, the influent total nitrogen concentrations were reviewed: the maximum was reported as 58 mg/L; the minimum was 15 mg/L with a standard deviation of 10. The alkalinity is reported as 310 mg/L. With that alkalinity concentration and influent total nitrogen of 38 mg/L the system's ability to nitrify is not limited by alkalinity and it is therefore easy under these conditions for a system to achieve the required total nitrogen treatment objective of 50% removal. However, in some observations, the total nitrogen concentrations were higher than 38 mg/L and the total nitrogen removal was better than 50%, for example influent TN of 56 mg/L and effluent TN of 10 mg/L .

The Maryland raw influent TN concentration data ranges from 10.1 mg/L to 254mg/L (which may be sampling error). 50's, 60's or up to 70's (expressed in mg/L TN) typify the normal residential wastewater influent. There are 31 sample events, 55 overall and 58% of the time they exceeded 50% TN removal. There are only three systems in this group with an average of 19 mg/L total nitrogen in the treated effluent. George doesn't think that the Maryland data support NSF standard 245 report data for the Singulair TNT. However, the unusually high influent strengths could be the result of sampling error: if a sample is collected with a small chunk of solids in it, when it is shaken at the lab before the analytical test or tests are performed, that bit of solid will result in higher concentrations of some of the test parameters. This may have been the cause of the high concentrations in the set of results from Maryland, because generally the results don't look bad. Flow data for the Maryland systems would have helped us better understand their performance results.

A Massachusetts provisional approval requires that 90% of the time a system is meeting the standard. In RI we haven't set a percent of systems' data that must meet our requirement of 50% reduction of total nitrogen and 19 mg/L in treated effluent, we look at the average for each system.

There was some discussion of the report from Barnstable, MA, "Performance of Innovative Alternative Onsite Septic Systems For The Removal Of Nitrogen in Barnstable County, Massachusetts 1999-2007" which reported that nitrogen removal systems are only treating to the MADEP regulatory limit of 19 mg/L 50% of the time.

Noel asked about considering development of a loading-based requirement, which would acknowledge that low flow uses will produce a more concentrated effluent, rather than the current standard which requires that a set concentration be produced. Russ agreed that we should have a discussion on this.

Noel suggested that under the experimental application we require at least three systems to be installed, and that these three proposed sites should be identified as part of the application, but that we could give them some time between installations, perhaps 90-days, and that we accommodate minor modifications to the system that could result in improved performance. This met mixed review: what if a vendor walks away before all three are installed and how much modification would be considered minor? And, if this worked *ideally*, it could result in a better system than that which was initially proposed.

Russ asked if anyone had any questions about the Rule change. No one had any questions, but George wanted some additional discussion about NSF 245 influent waste strength and approving systems that demonstrate compliance with the RI regulatory standard on the basis of this testing and certification. He's been dealing with the issue of low influent strength and its impact on interpretation of testing results since the mid 1980's, when it was proposed that effluent from a lift station in SK at URI would be used for a testing protocol (at what is now the NEOWTC); reviewers claimed the waste strength was too low for the proposed testing to yield results that would be indicative of performance under actual use conditions. Municipal strength wastewater is known to be lower than that which is produced at a typical home. To remediate this issue, URI researchers amended the influent waste strength. A nutrient pump was used to feed ammonium on a timed basis into the test system influent to increase the total nitrogen from 40 mg/L to about 65 mg/L for the research project. George was one of the reviewers of the Barnstable project for which a nutrient pump is not used; their influent, which is diverted wastewater treatment plant influent is at about 38 mg/L. And although there remains the issue of concentration versus loading, the report from Barnstable does show less than 50% success complying with the MADEP treatment requirement.

Russ called everyone's attention to page 8 of the Norweco Singulair TNT NSF 245 report, where the effluent quality parameters required for the system to successfully pass the Standard 245 evaluation are reported. The average total nitrogen of all effluent samples must be less than 50% of the average total nitrogen concentration of all influent samples.

George explained that with higher nitrogen concentrations there is an "alkalinity wall" condition, where available alkalinity is depleted and nitrification will not occur. About 7.5 mg/L alkalinity is required to convert 1 mg/L ammonium to nitrate and fostering nitrification is the hardest step of the nitrogen removal process; denitrification is easily accomplished with low enough oxygen status.

Deb distributed three sheets that she developed for review of the systems that have this certification: a list of vendors and their products with Standard 245 certification; a list of the performance criteria for Standards 40 and 245; and a summary of the first four of the 245 certified products' TN data (only four were included because of time constraints). There are 11 vendors (reported as of October 27, 2011 when she prepared this list) and 62 individual products among them (in many cases, these are different sizes of a treatment system). Two of these vendors' systems have nitrogen removal approvals in RI. **TN influent** data (mg/L) for the four technologies summarized range from 29 to 52, 26 to 55, 30 to 61 and 29 to 98, with averages (mg/L) of 39, 43, 44 and 43. **Effluent** ranges (mg/L): 8.6 to 23, 2.6 to 31, 6.8 to 36 and 2.2 to 50, with averages (mg/L) of 16, 9, 18 and 8.9.

Adjournment and Next Meeting

Because of the lateness of the hour, it was agreed that we would postpone the large AE system compliance update until the next meeting. The next meeting was scheduled for June 28th, pending availability of a meeting venue and the meeting adjourned.