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

The meeting was held at the South Kingstown Town Hall

April 25, 2008

Approved

Present: Noel Berg, Joe Frisella, Susan Licardi, Ken Anderson, Dave Burnham, George Loomis, Dennis Vinhateiro, Russ Chateauneuf, Tim Stasiunas arrived during discussion of compost toilets
Absent:
Others present: Dick Pastore, Deb Knauss (DEM)

Call to Order: 8:48 AM

Materials Distributed:
- Draft Agenda for this meeting
- Draft minutes of 2/29/08 meeting
- DEM Clarification on the Applicability of the Denitrification Requirement in the OWTS Rules to Repairs in the Critical Resource Areas
- Senate Bill S-2626
- April 24, 2008 DEM letter to Hollister Siegmund
- Steve Corr question regarding RSFs

Minutes of February 29, 2008
Corrections required:
1) Dennis was not in attendance at the meeting, as the minutes erroneously report.
2) Page 2, paragraph 3: edit the first sentence by inserting "pump" between "cannot" and "the system".
3) Page 2, paragraph 7: edit last sentence by deleting "and that if specified".
4) Page 2, paragraph 8: edit the last sentence by changing the list materials with which the center manhole might be sleeved to: "poly, PVC or fiberglass".
5) There was discussion of Deb's note in the minutes on page 3, in the last paragraph of the section "PSND/BSF Loading Rates" regarding whether she had accurately captured the group's desired language for "Note 3" in the document. Russ stated that DEM has already distributed the modified document, but an effort was made to ensure that the minutes accurately reflect the group's desired language for that note, as expressed at the meeting. Russ stated that it was initially intended that the sand layer be required when the effluent is being discharged to a horizon with the soil textures specified in the row with Note 3 associated with the loading rate. George agreed that this note was reserved for sandy/coarse soils with little treatment potential. Russ read from his notes *approximately* the following: "design on the most restrictive layer within three-feet of the bottom, the sand layer is required if discharging into soil of these textures".

Motion: Ken made a motion to accept the minute with the noted corrections.
Second: Joe seconded the motion
Discussion: There was no discussion.
Vote: All who were present at the meeting, with the exception of Tim, who had not yet arrived, voted to accept the motion.

Clarification on the Applicability of the Denitrification Requirement in the OWTS Rules to Repairs in the Critical Resource Areas
This document as distributed via DEM OWTS listserv, to clarify specifically what components of a system must be replaced to constitute a repair requiring denitrification.

Composting Toilets as Nitrogen Removing Systems
Russ introduced the following question posed to him by an attendee at the recent meeting in Charlestown at which the denitrification requirement was on the draft agenda: **would a compost toilet, installed in place of a failing leachfield, satisfy the denitrification requirement?** The question applies for new construction in addition to repair and without additional treatment of grey water. The new Rules allow use of a composting toilet without a variance application and that they also define a grey water system as having a grey:black ratio of 60:40. With 40% reduction of flow to the leachfield, and RI's denite standard of at least 50% TN reduction,

a compost toilet with no solids disposed on the site, would appear to provide greater than 50% TN reduction. There is no DEM conclusion regarding this; Russ is seeking discussion with the TRC. About 30 permit applications incorporating composting toilets have been approved.

General

- A deed restriction could be required.
- Joe asked often, if an incinerator toilet would be a better option. Although these make the solids management issue easier, factoring in rising energy costs, challenges or complicates a presumption they are better: the issue of carbon foot-print was raised at the meeting in Charlestown regarding the energy-use associated with A/E systems.
- Concern was expressed that, if approved as a denite option, that DEM might use of compost toilets in certain circumstances.

Treatment Issues

- URI: RUCK systems in the mid 80s to the early 90s reported a range of TN concentrations in grey water of 12 – 22 mg/L
- Grey water potential fecal and pathogen load (Charles Gerba, University of Arizona microbiologist)
- Some manufacturers/vendors state that solids can be used onsite as fertilizer material – but proper management practice is critical. Although on-site soil amendment with solids might result in some plant uptake and sequestration by other mechanisms, off-site solids management would ensure the N-load to the site would remain acceptable.
- There is an evaporation pan from which overflow is discharged to the leachfield. The remaining liquid crystallizes and must be washed from the unit; this would likely be done on the lawn.
- Liquid that develops within the compost bin (referred to as tea) may be dosed by a pump to a grey water tank for denitrification.
- Compost toilet technology is advancing and now there are "flush" options available with some of them.
- If liquid is discharged to a leachfield it will not qualify as a nitrogen removal system
- If the **grey water** were applied as shallowly as possible even more N-removal would be provided.
- Grey water would have to meet the 19 mg/L standard and in-home flow management is an important consideration.
- The whole "system" must be considered, before an individual construction permit application could be considered as meeting the denite requirement.
- Dispersal of grey water bears site-specific consideration and that might rule out conventional leachfields in some cases and introduce PSNDs and pumps.
- **Conclusion: Compost toilets can not be evaluated with regard to their ability to satisfy the N-removal requirement without consideration of the whole system**

Factors – practical/logistical/O&M

- In most repair scenarios compost toilets are not acceptable because the toilet must be directly above the compost bin; more easily accomplished with new construction.
- Expect few would be willing to exercise the compost toilet option – Dave noted that none of the clients he has worked with have opted for compost toilet.
- **Solids management**, within the unit is a concern: how much, if any, will be done. **Seasonal** use might not be such a big **O&M** issue, but full-time occupancy will require O&M.
- Tim reported his company does not, nor is he interested in performing O&M for compost toilets.
- O&M might not be being performed on those approximately 30-40 that are in-use and some of them might have been converted to conventional toilets without a DEM permit.

Motion: Ken made a motion to seek consensus that **compost toilets** could satisfy the denite requirement, with consideration that there are qualifying issues that must be resolved.
Second: Dave seconded the motion.
Discussion: Joe wanted to know if incinerator toilets could be included, as they are the same thing because they do not discharge black water. Russ replied that DEM sees even less of these than compost toilets and that that is not the question that was posed.
Russ restated the motion: TRC recommends that compost toilets satisfy the denite requirement for 50% TN removal, however issues and questions regarding maintenance and use, which will ensure the N-removal advantage the technology can provide.
Discussion: It was asked why this decision needs to be made now, couldn't an application for this purpose be submitted to the TRC. The Barnstable County Report was referenced which reported that a composting toilet achieved 5 mg/L TN; this indicates that a composting toilet with RSF for the grey water can provide good

nitrogen removal result. It was asked what type of compost toilets DEM wants to encourage, as there is a range of products available and the issue of carriage water must be considered with each product considered; also what grey water system would be appropriate.

Approach options for official consideration of compost toilets for denite:

- **TRC required review** of individual compost toilets for nitrogen removal. If so, how would such an approval be articulated for vendor-specific approval incorporating issues such as carriage water and appropriate grey water system(s). Consider incorporating monitoring requirement as with Class II technology approvals.
- **Policy development** – if the toilet and home use (management issues) comply, considered to satisfy denite requirement. *Example* – tanks: if they meet the standard, they do not require TRC review. Compost toilets could be approached the same way, except that there is no standard associated with these.

George requested that the issue be tabled until a later date.
Motion withdrawn: Ken withdrew the motion.
Second: Dave seconded withdrawal of the motion.

Motion: George made a motion that Deb formulate the discussion of today's meeting for use as a draft to go forward at the next meeting, with the goal to help guide future decision regarding vendor or applicant submission for denite consideration.
Second: Ken seconded the motion.
Discussion: Joe wanted to add incinerator toilets to the discussion.
Second: Dennis seconded the motion.
Vote: All present voted in favor of the motion.

Nitrogen Removal Requirement in Critical Resource Area - General

- Is the **denite requirement is worth the effort?**
- **Woodard &Curran report:** explores options to achieve a target reduction of 61-% of current N-load to Green Hill Pond. The DEM position is that the denite policy will help in the long-term on the basis of the report. Alternative (to denite onsite systems) options: 1) **sewering**, but Russ noted DEM has been involved with Portsmouth for years, and sewering as a solution has not been accepted, although, in that location it would have been thought to be an easy decision; 2) **breaching the pond,** but it is not certain what the result would be. The report suggests this as a trial, with consideration of the uncertainty.

Financial Impact/Relief

- There should be a **tax credit** available for properties forced to install nitrogen removal systems. This was suggested for the cesspool phase out, but was not incorporated.
- There are people who do not qualify for the low interest loans. Charlestown is going to amend the eligibility.

S-2626

General:
Proposes amendment of the designer licensing statute, **creating a new license class for designers**, with the minimum eligibility requirement of an installer's license. **Design authority:** residential up to 2,000 gpd, commercial up to 900 gpd and alternative technologies up to 2,000 gpd residential and up to 900 gpd commercial.

Russ does not know of its origin, thinks it is responsive to DEM requirement for denitrification in the critical resource areas: Bill's purpose reduce expense of denite systems. He asked Bob Ballou to report at the hearing, the cost relief issues under consideration by the TRC (expanded authority of Cl-I designers, and use of conventional leachfields with denite systems) in an effort to demonstrate that cost-relief measures are being considered for implementation.

Implementation/training/examination:

- Development of the exam would be difficult and many may not pass.
- URI: supports philosophy of professionals as life-long learners; with proper training, well-educated professionals can perform the work in question. The Training Center could easily develop the exam and would be happy to do so with stakeholder contribution.
- Currently, there are businesses in which system designs are prepared by staff that are not licensed as designers, but that the work is signed off on by someone with the proper license.
- Some group members expect that only the best of the best will pursue this new license if the bill passes.

Cost Benefit for Applicant

- George reported that he hears about the cost of advanced treatment systems from many, including those that can easily afford the cost. High cost is a problem and any measure that can introduce competition and keep costs low is worthy.
- Reported costs ranged from:

GL - Engineering costs for a denite system as $6,000 - $8,000.
Joe reported $4,000 -$5,000, that $6,000 - $8,000 is usually for NBC not for a repair, because NBC may include permitting issues such as review by Zoning, Conservation Commission, Coastal Council, and Wetlands.

- Continuity of designer and installer would result in cost and time benefit.

Dick Pastore (Opposition): Currently, a PLS or PE comes to the designer licensing exam with a body of knowledge and experience that cannot be acquired in a short-course. Although septic system design is not taught in the college courses taken by these professionals, they accumulate a knowledge base of applicable topics including biology, geology, hydrology and soils. He cited the importance of knowledge of wastewater characteristics and strength that Class Is would not have, that this can not be taught in a short course and how this could contribute to system failures. The denitrification requirement in the critical resource areas is a measure to restore and protect a sensitive resource; reduction of the credentials required to implement the measure is at odds with its intent. He does not support that this has to be considered an economic issue. He provided a copy of a letter that he sent to the sponsors of the bill and copied to the DEM Director.

Joe Frisella (Opposition): reinforced Mr. Pastore's remarks regarding knowledge and experience required by the current eligibility requirements for the Cl-II & III licensing exams. There are two statutes governing the activities performed by PLSs and PEs. He also noted that there are other professions with licensing requirements, such as MDs and that although some are better than others and some nurses might be better that the MDs, the proper educational credentials are required to practice medicine. Engineers must know tanks are waterproof, correct distance to property lines, waterbodies and wells. The new Rules go beyond necessary measures for protection by requiring replacement of cesspools all the way to the Town Hall, when South of Route 1 would be adequate; he does not see how nitrogen will reach the pond from a distance as great as the Town Hall. He suggested limiting the nitrogen removal requirement to lots less than one-half or one-acre and South of Route 1; considering location of wells and groundwater flow direction and that this should be the case for both NBC as well as for repairs.

Dave Burnham (Support): There is a group of installers with the capability to do this work. In the Rules there is a provision allowing Cl-I designers to design alternative systems. A license of a specific class does not assure competence; he has seen instances when DEM has by default designed systems and knows that he can do better work than some Cl-II & III designers. Allowing Cl-Is who demonstrate competence to do denite designs, will reduce cost and be a service to the public. Many of the installers who did not pursue a designer license and others that allowed their designer licenses to expire were responding to the risk and the additional responsibility; this suggests that not all that are eligible will pursue the new license.

Proposed Expansion of Class I Design Authority

The issue is the cost of systems; this topic was introduced in December 2007 based on minutes of the meetings. Class Is may currently design A/E leachfields, but not technologies. **Two cost-relief measures under consideration:**

1) Under what set of circumstances can Cl-Is do this work? And if Cl-I design authority is expanded, how to distinguish Cl-I has the knowledge and skills necessary to do these designs.
2) To what extent do the leachfields used with nitrogen removal systems have to be PSNDs or BSFs (as is required by most certs in the critical resource areas)?

TRC recommendations from the 1/11/08 TRC meeting include: document training on and successful track record of installing the technology; Cl-I allowed to take the Cl-II and or III exams, but this was rejected as they do not meet the eligibility requirements.

Support:

- Russ supports some change and that since A/E has become more familiar to the design community and to the public.
- It would serve the public, assuming a qualification process, in terms of being a cost-saving measure.
- Noel: Tiverton is implementing inspection of cesspools in the critical resource area of Stafford Pond. Cottages are expanding and are not repairing their systems/many of which are cesspools. It would help

these residents to repair with A/E, if with suitable testing of qualifications an installer could perform the design work, thus reducing the cost.

- Modularity of advanced treatment systems simplifies design and installation, since the vendor has done the engineering and pre-matched the components.
- Software developed by the Training Center is available for pump calculations; this is used by many Cl-II and IIIs.
- Vendor training is available; OSI has an O&M, installer and designer cert for their product.
- Many installers have more substantial insurance coverage than Cl-II and III. Was suggested at time of licensing program development DEM should have required errors and omissions insurance as part of the license requirement, but DEM did not want to mandate this at the time the licensing program was being developed.
- Given the controversy consider starting with A/E for repair, with performance evaluation sometime after implementation.
- DEM has the authority to allow A/E to be designed by Cl-Is; when the I/A program was being developed, it was decided that the Director could approve an I/A technology for use by Cl-Is and that DEM could set criteria on a technology-by-technology basis and allow such use with limits.
- Currently, every repair is essentially a new system; all of the components of the system are replaced.
- Cl-Is are reviewing and supervising their own work under current practice. Russ was askd if DEM has had any problems with this. Russ replied that most of the complaints received are regarding Cl-II & IIIs. He added although there is no second party supervision of installation of Cl-I designer repairs, there is homeowner oversight and a relationship between the Cl-I and homeowner that would not exist with an installer in a situation where the design is prepared by a Cl-II or III; there is an understanding that if something goes wrong, the Cl-I will receive a call from the homeowner.
- Regarding quality control Dave noted that he has witnessed lax and inconsistent QC and it is independent of design class.

<u>Concerns</u>

- DEM staff spend a good deal of time with Cl-Is getting designs up to acceptable form and concern among staff with issue of Cl-Is designing A/Es and this issue of staff involvement.
- Proposed design flow increase from 900 gpd to 2,000 gpd for a repair or an alteration would allow home to go from 4 up to an 8-bedroom design. Support bill with maximum design flow of 900 gpd.
- Consider reducing maximum design flow to that of a three-bedroom dwelling.
- The stakes are higher in the critical resource areas: reluctance to support Cl-I design of A/E systems.
- Issue of legal authority to be considered.

<u>Observations/Expectations</u>

- Russ: introduction of the bill indicates that there is a perception of merit in the legislature. He has explained to the DEM Director the consideration that the TRC had been giving to expansion of Cl-I design authority and asked if that might reduce the legislative imperative associated with the bill.
- RI Experience with nitrogen removal systems has been on sites where nothing else will work. DEM has not found resistance as a result of expense with these sites where the technology is the key to obtaining a permit. Yet cost will be a different issue on a lot where a conventional system would fit.
- The cost of home electronics has decreased with intensified use and it might be expected that this will happen with A/E technologies.
- Use of conventional leachfields will decrease the cost compared to PSNDs and BSFs.
- Either expanded design authority of Cl-I or S-2626, would result in one professional being involved, resulting in elimination of the cost associated with Cl-II & III installation oversight.

Joe re-emphasized what he stated before and requested that Deb re-state in the minutes the comments he made previously. ***–Ssee page 3 for*** Joe Frisella ***Opposition remarks initially made.*** He added a key point is quality control; Cl-II & IIIs are responsible to observe construction, this is lost with Cl-I design. A repair project begins with analysis of the cause of failure, evaluation of the elevation of the groundwater table, involves careful attention to grading and inverts from the building to the design watertable elevation. The bill violates existing laws; PLSs and PEs are not allowed to apply for the designers' tests with out the proper registration of their professional qualifications. DEM should re-consider the Rules regarding nitrogen removal in critical resource areas, because they are unreasonable. The nitrogen removal requirement should be modified with regard to lot size and setbacks to ecosystems. It is a mistake to take PEs and PLSs out of the equation. People who wish to perform this work should pursue the proper professional registrations. He added that not requiring a soil evaluation for repairs is wrong, as groundwater table elevation could be the cause for failure.

Cost
Joe has heard as much as $15,000 for a repair, but $4,000 - $5,000 is reasonable. Cost was reported to range from $25,000 to $35,000, though there were differences of opinion as to the total cost including, design/engineering.

Dave and Tim an AX package, including the pump basin, 2 pumps, control panel, liner and manifold, without the concrete tank, pipe and aggregate costs $10,000; material costs would exceed $15,000 installed for a repair.

Russ stated that he is hearing support for Cl-Is to so some A/E repair with conditions, with some objections and that although there is no time today additional discussion of the conditions under which Cl-I design of A/E might be allowed without Rule and Statute changes. He asked for a motion.

Motion: Noel made a motion that the TRC support Cl-I design of A/E treatment systems, under current Rules, with conditions to be considered at a later date.
Second: Susan seconded the motion.
Discussion: Ken asked if this is a motion to endorse a concept or to develop criteria.
Amended Motion: Noel amended the motion to "TRC endorses the concept of moving forward with Class I design of A/E treatment systems for repair only with DEM to come forward with training and specific criteria in terms of training and experience and an examination, if necessary."
Discussion: Ken asked it there would be an opportunity to consider the DEM-developed conditions. Russ assured him that there would be.
Vote:
In Favor: Noel Berg, Susan Licardi, Ken Anderson, Dave Burnham, George Loomis, and Tim Stasiunas
Opposed: Joe Frisella
Abstained: Dennis Vinhateiro

Letter to SESI Regarding the Application for Nitrogen Removal for Singular
Russ asked George who had earlier noted that he had comments on the letter, and the others to look at it and e-mail DEM comments for follow-up with Hollister.

Motion: Dave made a motion to adjourn.
Second: Ken seconded the motion.
Discussion: Regarding the Siegmund letter, Tim wanted the TRC to know that OSI is requiring all the standard wastewater effluent chemistry measurements to be made on an annual basis as part of the standard O & M.

George added that in Barnstable County systems are reported to be performing in compliance with the treatment standard only 50 – 60% of the time and they are leaning toward requiring quarterly sampling for nitrogen removal. He also emphasized that a nitrogen removal approval for Singulair is a complicated issue for the following reasons: if there is a problem with a Singulair denite system, one must approach SESI; but for O&M certification, one must approach Norweco and if a change must be made to the system it would negate the NSF certification.

Vote: All present voted in favor of adjournment.

The meeting adjourned at 12:40 PM.

The **next meeting** was scheduled for **May 30th at 8:30 in the South Kingstown Town Hall Council Chambers**.