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

July 22, 2010

Draft Minutes

Present: Dave Burnham, Noel Berg, Russ Chateauneuf, Joe Frisella, Susan Licardi, George Loomis, Brian Moore, Tim Stasiunas and Dennis Vinhateiro

Absent: Ken Anderson

Others Present: Lee Verbridge and Josh Cobb of SeptiTech, Dan Cotta local SeptiTech representative and Deb Knauss (DEM)

Call to Order: 8:40 AM

Materials Distributed:

- Draft Agenda for this meeting
- Draft Minutes of 4/30/10 meeting
- Summary of SeptiTech's supplemental submission
- Use of Polyethylene Tanks/distinction between processing and septic tanks
- Summary of RI requirements for surge storage

Minutes of April 30, 2010
Motion: Joe made a motion to accept the minutes with the necessary edits.
Second: Susan seconded the motion.
Discussion: There was no discussion.
Vote: All present who were present at the January 22nd meeting voted to approve the minutes as presented (Dave Burhnham who was not at that meeting abstained).

Other issues:
Rule 17.4.1: Joe sought clarification of this Rule, specifically if:

1) A home with an ISDS (OWTS) permit approved in 1990 (not a nitrogen reducing system)
2) The square footage of a home is proposed to be increased by more that 50%
3) Building Permit is obtained
4) There is no proposed increase in flow
5) The Building Official declares that the project must meet the flood plain elevations

Is this OWTS required to be upgraded to a nitrogen reducing system?

Russ stated that on August 4th, when the revised Rules become effective, in the case presented above the OWTS would have to be upgraded to nitrogen reducing technology. If the building permit is obtained before August 4th, 2010 in the situation summarized above, the OWTS upgrade will not required. The 50% of floor plan provision is in the flood resistant construction section of the state building code.

Pea Stone
Brian Moore had samples of pea stone to demonstrate a quality range. None of the samples satisfied the pea stone specification in the "*Advisory Concerning BSF Design and Installation Procedures - Cold Weather Related Design Adjustments and Precautions***" (**Cold Weather Advisory, 4/30/04): some of the samples did not meet the dimensional element, others were not clean and none of the samples' stone was round or sub rounded.

Stone slightly larger than 3/8-inch-diameter is not a problem; the most important element of the specification to satisfy is that the stone is clean. There was some discussion about changing the pea stone specification to allow a slightly greater range in size. It was acknowledged that subrounded stone cannot be produced by crushing and that angular stone, although not optimal for maximizing pore space, is acceptable if it is clean, and the size variability is not too great. Allowing ¼ - ½ inch stone would be too great a range because of loss of pore space due to compaction. Crushing and chipping produces a lot of fines so the product of these processes requires double washing. Dave stated that all the parties involved from making to delivering the product, are responsible for its quality. The stone can be of proper size and clean, but if the facility operator pulls material off the bottom and scrapes up fine material and the driver does not notice, or reject that load, dirty stone will be delivered.

There was discussion of quantifying the acceptable maximum presence of fines. It was agreed that the acceptable presence of fines described in the pea stone specification in the Cold Weather Advisory, as "little or no" fines is better expressed as less than 2%.

Russ suggested that the spec be revised to allow no more than 5% in the ¼ - ½-inch diameter range.

DEM will revise the specification and seek TRC comment. When it is finalized, DEM will send a memo to designers, installers and providers and post the memo to the website and distribute using the listserv.

It was noted that PSNDs are being installed more now, since the line spacing was reduced. This is advantageous because of better treatment and there is no quality control issue as there is with the media used in a BSF.

SeptiTech

Deb distributed the explanation she prepared regarding her misinterpretation of the Rules concerning use of polyethylene tanks and why she was incorrect in her assessment that polyethylene tanks could not be used as processing tanks.

Dave stated that although none of the polyethylene tanks meet the required liquid depth of 48-inches, he is impressed with the structural integrity of the Fralo tanks. Since structural integrity is the most important concern with polyethylene tanks, has asked if we could consider overlooking the liquid level requirement.

The other issue is flotation in areas with high gound water.

Lee Verbridge stated that most of their units are concrete. They use concrete tanks for their processor and septic tanks except where access issues prevent it.

Lee stated that the polyetlhylene tanks also provide s urge storage capacity. This is described in the supplemental material.

Joe was concerned about approving use of the Fralo polyethylene tanks specified by SeptiTech or an equivalent, in case Fralo goes out of business. But if this were to occur, SeptiTech, as the vendor should make the request to substitute another manufacturer's tanks and support the request with documentation that the tank is suitable for use.

Surge storage capacity presented at Tab 1 in the supplemental material. Deb distributed her summary of the various RI requirements for surge storage capacity.

¼ gallon per orifice per dose is the maximum loading to a BSF and PSND. The typical dose is 10 – 20 gallons.

SeptiTech changed the elevation of the discharge pump and of the support system for the media pillows and this provided surge storage capacity of 144 gallons in the M400D in a concrete tank which is 31% of the design flow and 160 gallons in a Fralo polyethylene tank. SeptiTech thinks about this as the capacity to equalize 31% of the daily flow at a given time.

Russ asked if this is adequate for a three or four bedroom home, since the other technologies are providing two-times the daily design flow. George noted that it is important to consider how the system handles the flow and if is able to properly treat the peak flow. He asked if in a peak override situation, does the discharge pump, which works on a timer, shut off or continue pumping? SeptiTech replied that the pump stays on until the excess volume is discharged and the high float goes back down and the system is satisfied. ½-inch of water triggers the float switch; this is 10 – 15 gallons of water in a 100-gallon tank. There is a delay in the system which prevents the pumps from reacting to temporary high float elevations produced by waves, rather than sustained elevation of true liquid volume. If the pump stays on for one-hour, an alarm will sound, but this can be reduced to 5-minutes.

Since SeptiTech's nitrogen removal system would be used in coastal areas where there are a lot of rentals, peak flow may be more of a problem than one might think. Someone asked about how the AX handles peak flow situations. That system has a larger tank and also, the discharge pump's off-time is reduced. The pump shuts off at the end of its timed dose and doses more frequently, but always discharges the same volume per dose. The AX storage is 200 gallons, compared to 144 gallons in the SeptiTech unit. The result is the same, discharge the surge, volume, but the AX takes more time to achieve this result.

Lee stated that they use a lot of these on Nantucket and Cape Cod and do not have problems with high flow alarms. Some of their systems are used with drip dispersal and others with stone and pipe trench leachfield systems.

George asked if they change the high float alarm to less than one-hour; even if the pump is discharging for ten minutes, a lot of water has been discharged. SeptiTech responded that at least the service provider is noticed that this event has occurred and if the system persists in sending these alarms, it will be known that this system owner is over-using the system and the permit limit has been exceeded. In the Outer Banks in NC, the design usually specifies the next size up; the designer has some responsibility to establish expected use and design accordingly.

Tim stated that the minimum septic tank in Charlestown is 1,500 gallons. Russ asked what would happen if 300 gallons were discharged in one hour, because as unlikely as it seems, it has happened. If 300 gallons is used in one hour it is probably not high strength water. But it is the wastewater that was in the processing tank that would be discharged and not the 300-gallons of water most recently used in the home. Regardless, the issue is the capacity of the receiving leachfield.

There was discussion of ways that SeptiTech might be able to provide for even greater storage capacity. One problem is that most of the concrete precasters have discontinued production of 1,250-gallon septic tanks, but it is available in polyethylene. The low float can not be lowered any more because the pump casing would be exposed and this could result in overheating. If the recirculation pump is lowered, it is in the sludge.

Lee suggested that if a particular system is frequently sending high float alarms, they could adjust that system in the field, to allow the pillows to float, if necessary. He stated that with some growth on them, they do not readily float and therefore the risk of floating them up in to the spray heads is reduced. If they raise the bottom of the pillows up two inches, they will gain an additional 40 gallons.

The 1500 gallon tank could be used for the M400D and M550D, but then it was posed, what would they do for the larger systems. Use of larger tanks would increase the cost of the system. It was further considered that the likelihood of use beyond the design flow is less likely in homes with six or more bedrooms.

George asked what they do in MA, where storage of a full day's flow is required. It was explained that the difference is that MA calls it emergency storage capacity and considers it an emergency situation. If the discharge pump fails, for example, that is a critical fault and the system will retain one-day's design flow, allowing a service provider one day to get to the system and restore proper function.

Joe had to leave, and told Deb that if a vote is taken to approve this technology, his vote is to approve.

Tim asked about OSI's interest in raising the elevation of the splitter valve in the AX. Russ told him that they have not approached DEM.

Lee asked if they could put the processor in a larger septic tank and use the same septic tank required in the Rules for the system's design flow. Since daily design flow for a 3 bedroom home is 345 gpd, half of this is 172.5 gallons. Would a 1250 gallon processing tank achieve this volume?

One of the SeptiTech representatives explained that they scaled up the proportions for their systems, based on the M400D which received the NSF approval, to achieve the hydraulic retention time necessary to achieve the treatment performance that was demonstrated by the M400D.

George asked if they increased the hydraulic retention time if it would negatively impact the nitrogen removal result. The reply was no, but that most states' approval proves is dependent on NSF certification and that is why SeptiTech as scaled up all their models to be proportionate with the M400D.

If a seven-inch float band were set at nine-inches, then the liquid level would be at the level of the media and the volume would satisfy the requirement for a three-bedroom system but not a four-bedroom system.

The option of using the additional 2-inch float band in a 1,000-gallon tank for a three-bedroom system and use a 1250 gallon processing tank or, if that volume septic tank is not available, a 1500 gallon processing tank if the system is specified to discharge to a BSF, PSND, GeoMat, drip or other pressurized drainfield. Dave added, that a designer may alternatively use a conventional drainfield where this is allowed.

Russ asked if the large systems' data SeptiTech submitted was quarterly or annual. It was responded that the Brackett's Landing system was a big concern for that town and the sampling began at biweekly and was gradually scaled back. George wanted to know what the actual used was for the large systems/if they were operating close to their design flow. These systems are operating at about 60% of their design flow. Russ noted that his is consistent with what we see in large systems in RI, except for schools.

George had some questions based on his review of the supplemental material. These are presented below.

At Tab 2 Page 1, he requested that they add water tightness.

In the column on the right, verify that they are watertight with testing.

Page 8, in the description if the 6-inch bedding, there should be some mention of compaction.

On Page 10, where the mounting the controller is addressed, he requested that all the controllers be mounted outside on a pedestal and be heated.

On Page 12, Maximum distance between lid and tank is stated to be no deeper than 24-inches…..if this means maximum burial depth of 24-inches, state this.

Page 13, where the direction is to bury the piping below the frost level, George wanted to know about if piping flowing back and draining back is a problem with the tank up high and the piping down deeper. It was clarified that the direction is intended to provide for either insulating the piping or this deeper installation.

On Page 8, at Fralo tank installation instruction, add water tightness.

On Page 9, add the compaction of bedding as requested earlier.

On Page 10, it is stated that no water is required during backfill in the polyethylene tank installation instructions. Josh stated that this is a Fralo thing and a testimony to the strength of their tanks. He has no issue with modifying that part of the installation instruction.

On Page 11, describing the mounting of the controller, edit the instructions as requested above.

Regarding the temperature sensitivity of the controllers, Josh reported that they no longer have touch screens and this was the most temperature sensitive component in the panel and that they now mount them outside for 24-hour access.

At Tab 3 on Page 46, ……. Deb missed this specific requested edit or action.

At Tab 4, for pump discharge – Deb missed this specific requested edit or action.

Next page, "…in the form of a hose". George asked that they change this to allow for use of the home's spigot, but that they require that the installer bring a hose because of liability issues.

The annual fee of $250, should this be included there? It was noted that the cost could change with time but also was noted that Block Island has a surcharge. It was also asked that the changes be made at Tab 6.

Russ asked if anyone would like to make a motion to approve SeptiTech for nitrogen removal with the provisions discussed during the meeting today regarding the polyethylene tanks and surge storage capacity.

Motion: Tim made a motion to approve SeptiTech for nitrogen removal with the provisions for polyethylene tanks and surge storage capacity discussed at the meeting today.
Second: Noel seconded the motion.
Discussion: There was no discussion.
Vote: Everyone present voted in favor of the motion.

Deb asked about the definitions in the SeptiTech supplemental material and if anyone thought that we should require that a note be added to some of these, acknowledging RIDEM definition of same term. George suggested adding to the title in the definitions section in the manual "SeptiTech", making it clear that these are their definitions.

NEOWTP Proposal for Development of Guidelines for Pressurized Drainfields

George refreshed the memory of the group that NEOWTP had proposed to DEM a while back to develop a guidance document that would include all pressurized drainfield options and proposes to include a low-pressure pipe option referred to as LPP. LPP drainfields are similar in nature to PSNDs, but they use a larger diameter pipe and would be used with septic tank effluent. This is a drainfield option that is used a lot in North Carolina. The proposal states that URI would assemble information and look at changes over time and collect materials for LPP as it is used elsewhere. They would convene a group if individuals for review of the proposed guidance document. This group would probably include some of the people who serve on the NEOWTP steering committee, DEM and CRMC staff, manufacturers, designers and service people. There will probably be some overlap with members of the TRC.

The proposal provides for two open forums, modeled after the State's review process. Russ stated that we would call these workshops and would post them to the DEM website and distribute notice using the listserv.

Tasks include develop draft guidelines for stakeholder workshops, collect information and comments also from ….Deb missed this entity from which comments would be collected, stakeholders, maybe?

When official review by committee is complete, draft final guidelines for the second workshop and then develop the final guidelines for review by the TRC. Upon completion of the review process and implementation, the guidance will become URI's property and when comments are made, they will integrate them as necessary. Eventually, a TRC vote to move the guidance to DEM as a guidance document. The proposal sets a one-yea goal for completion after the date of the agreement. George stated that they cannot begin work until there is an agreement and an account number has been established. He anticipates 60-days to complete the first draft and inform DEM that they are ready for the notice of the workshop.

The guidance will eventually become a TRC document as the previous guidance documents did.

Brain Moore asked why we would want to introduce LPP. George sees it as an opportunity for moving the leachfield up to a more biochemically reactive zone when a system design incorporates pumping STE to a gravity discharge. The intention is to replicate what is done with the PSND, but for septic tank effluent and with pipe of 1-1/4 – 1-1/2-inch diameter. This may be of use in the critical resource areas where there is large lot zoning in the upper portions of the watersheds. This would be used with a conventional system, to a pump chamber to the LPP distribution system. He thinks that the pipe will likely be proposed for installation in the upper 18-inches of the soil profile. In North Carolina, the use LPP, woven into treed areas, but he does not like this idea for RI. Heavy winds can uproot trees and the root systems bring the pipes up with them. They will draft the guidance requiring the same 10-foot setback to trees.

This would be reviewed and approved as the BSF guidance was. Russ stated that we apply the Administrative Proceedings Act's (APA) requirements to the process and adopt as official guidance. He explained that our process of promulgating regulations and policies is governed by the APA. There is a point at which a decision or action is beyond the definition of policy, as a decision or interpretation of Rule and then it requires promulgation as a Rule. He explained that if the APA is followed, that other laws also need to be followed, this includes preparation of a financial impact statement.

George explained that he envisions the LPP leachfield as an option, not a requirement in the areas where he explained that it may be beneficial. Russ responded that would be easier to adopt as an option although he did acknowledge that if LPP is included in accepted guidance, in some locations, it might have to be used because site-specific limitations make it the only logical choice, although its used would not be required by DEM in any geographic area.

Brian said that he had seem photos of large scale LPP installations in NC, where large numbers of pipeline were bundled together and then split-out, in diverging directions. He did not like the idea of installing fields of similar configuration. George stated that he was thinking of it as an option for single family homes and not anything on that scale.

Consistency of Advanced Treatment System Performance & Loading

Russ stated that as we all are aware, that when treating high strength effluent, treatment technologies have demonstrated ability to remove 50% of the TN, but they are not able to achieve 19 mg/L and he cited a couple of specific systems in RI.

One of these reported influent TN of 72 mg/L. The system was treating to 29 mg/L TN, but the permit RIDEM issued required treating to 19 mg/L TN. Water saving measures had been implemented and were contributing to a high strength condition.

The design flow for the system is 30,000 gpd, but actual flow is about 9,000 gpd. If one calculates the nitrogen loading for this system, using treated effluent TN concentration of 29 mg/L and use volume of 9,000 gpd, the result is a nitrogen load of well less than it would be at the permitted design flow of 30,000 gpd. They sought approval for expansion, but DEM did not want them to increase the nitrogen loading. They installed a Nitrex, but it is treating to 15 mg/L TN. Pio has explained that this is because the Nitrex is receiving 29 mg/L TN from the preceding AX.

Russ asked the group how we might deal with the discrepancy between permit requirements and performance. Although calculating nitrogen loading is not indicative of exceeding the permit, the TN concentrations are and the vendors are concerned about being out of compliance. Russ said he wants to talk to MA about their systems over 10,000 gpd.

Tim suggested requiring 19 mg/L ***or*** (rather than ***and***) 50% removal of TN.

George related a story about two residential systems that were upgraded from cesspools to denite systems. The residents were so frugal with water use, and therefore the effluent from their homes was of high concentration, but the nitrogen loading per year was low compared to neighbors whose systems' TN concentration were much lower.

Noel recalled that years ago we spoke about considering loading. Permits with discharge limits are obvious problems because they require performance monitoring which is an unwelcome additional expense.

OSI requested denite approval for large systems and stated they could meet 19 mg/L., but there are these large systems that are not meeting that level of treatment and the explanation is the quality of the influent. Although the request for large system approval was not predicated on specific influent characteristics.

Tim stated that unless we change the requirement to 19 mg/L or 50 %, we will continue to see this problem.

If the home occupied by the two older people using 55 – 62 gpd is sold to a young family, the carriage water will increase, the alkalinity will increase and the concentration of TN will get closer to 19 mg/L.

It is reported that at 70% of deign flow there begin to be excursions that jeopardize the performance result.

Both Nitrex and the AX can achieve the permit's performance objective, but both would need to be bigger. Do we require this? They need to know what our policy is.

It was recommended that the standard should reflect total loading.

All companies need to do a better job of making sure of compliance. The as approval requires that if the system is shown to be out of compliance by the performance data, the system is supposed to be re-sampled and adjustments made as necessary with re-sampling until it is shown to be treating to the permit requirement. This is not being done.

Next Meeting
The next meeting was scheduled for September 29th at 8:30 am, pending availability of the QDC Annex.

Adjournment
All business concluded, no other issues were introduced and Russ declared the meeting adjourned.

The meeting adjourned at 12:10 PM.