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

The meeting was held at the South Kingstown Town Hall

July 1, 2009

Approved

Present: Russ Chateauneuf, Noel Berg, Joe Frisella, Dennis Vinhateiro, Brian Moore, Dave Burnham, Susan Licardi, George Loomis, Tim Stasiunas and Jim Boyd (representing CRMC in Ken Anderson's absence)

Absent: Ken Anderson

Others Present: Dave Potts (Geomatrix Systems, LLC, GeoMat™ applicant) and Deb Knauss (DEM)

Call to Order: 8:40 AM

Materials Distributed:

- Draft Agenda for this meeting
- Draft Minutes of 6/10/09 meeting
- Geoflow Issues and Comments from Consortium Members
- Geoflow e-mails: Deb Knauss and Karen Ferguson with Geoflow price list
- Siegmund Environmental Services, Inc. Addendum to March 2, 2007 Singulair Nitrogen Removal Application
- SESI Singulair nitrogen removal data summary
- Incomplete draft PSND cover letter
- E-mails: Deb Knauss and Scott Samuleson of SeptiTech regarding seeking increased leachfield area reduction

Minutes of June 10, 2009
Necessary edits noted below:

Page 2: In the second paragraph beneath "Geoflow": "…solenoid valves in the distribution network in the access box~~es~~…"
Page 3: "…one-foot reduction in this separation distance for the PSND when using advanced treatment meeting a minimum effluent concentration of BOD/TSS of 30/30."
Page 3: "…and direct it to George, ~~w ho~~ who will in-turn distribute…"

Motion: Dave made a motion to accept the minutes with the noted corrections.
Second: Joe seconded the motion.
Discussion: There was no discussion.
Vote: All present, who were present at the June 10th meeting voted in favor of the motion.

Geomatrix Systems "GeoMat™"
At 9:00 Dave Potts arrived with a sample of the GeoMat™, a piece of distribution pipe fitted with orifice shields, an effluent screen (filter) and other associated equipment. Orifice shields are manufactured of clear plastic, to facilitate their proper placement over the orifices and are available for 1-inch and 1.5-inch diameter pipe. They are glued in place on the pipe so that they do not rotate during installation and backfilling of the field. The mat rebounds (springs back to form) after it is surface loaded. The filter Geomatrix prefers is a SimTech, with a stainless steel filter screen, that costs about $300. They have never had to clean the laterals using these filters. Dave explained that the application is not seeking approval for the introduction of air to the mat leaching system (images of an installation that Deb provided the group via e-mail that she found on the Geomatrix System' website included an air pump and generated confusion).

He explained that Geomatrix Systems, LLC is the patent holder and that although they do not own the manufacturing equipment, they have sole authority to distribute the product (neither of the check boxes associated with this were checked on the application). Geomatrix Systems, supplies the mat, fabric and the orifice shields, not the upturns, or controllers.

Dave explained that GeoMat™ is produced in 6, 12 and 39-inch widths and that the 78-inch wide configuration is two 39-inch widths installed edge-to-edge. The 6- and 12-inch widths are fully covered with filter fabric, as though within an envelop and the distribution pipe is inserted within the fabric envelop. The pipe is "stapled" in place on the narrow mats to prevent it from sliding off to the edge with placement of backfill. Backfilling with a dozer will put soil pressure laterally against the pipe; this is not a suitable installation technique. The 78-inch wide configuration may be used with one or two pipes on it, depending on the center to center orifice spacing, which is not specified by

Geomatrix, but left to the discretion of the designer. With the 78-inch width, Dave stated two pipes provide a redundancy if there is a malfunction with one of the lines. His preference however, over the 78-inch with is to use the 39-inch with one pipe on each mat. The 12-inch wide GeoMat™ bends for contour installation; the 39-inch width does not bend as well. Dave explained that if an installation is desired to be across the contour, drip is a better option, but that with the contour, this works well.

He uses a program similar to a pump-select program to work out the system design based on variables including orifice size and spacing, to achieve the optimal condition of filling half the mat volume with each dose. This program will report if the distal head result is out of proper operating range with the selected parameters.

Dave P. drills the orifices with a bit that produces a chamfered hole to prevent clogging, but stated that if RI is having success using a straight bit to drill the pipes for use in PSNDs, he is not going to mandate that a chamfered orifice be drilled in the pipe used with GeoMat™. RI is using 1/8-inch and Dave prefers 3/16-inch with STE, but emphasized that he will not challenge tools and techniques RI has been successfully using, noting that 1/8-inch orifice diameter is an option in the program and that RI would be using treated effluent. In CT if they introduce air to the mat (approval for this is not being sought in RI), that there is no biomat development.

On systems with data loggers, they can remotely monitor distal head pressure. In CT they do not go to a system on a scheduled basis for service, but rather respond to problems reported by the system's telemetry.

The maximum bury depth that would allow adequate air entry to the mat was considered. There was discussion of dry soil conditions and gases that may present in addition to or rather than "air"; the pore space in dry soil might not be aerated, but rather dominated by methane, hydrogen sulfide or carbon dioxide. Dave explained that there is more oxygen in a GeoMat™ field than in a pipe and stone trench because air is being pulled in by the suction created by the movement of the effluent through the mat and into the soil. It is generally thought that coarse sand will have oxygen in greater abundance than in a well-structure soil. Geomatrix performed an experiment to investigate this and observed that it is not so. They filled buckets with only marbles and others with a clay soil, saturated the buckets with carbon dioxide and then dosed the buckets with water. In the clay soil, all the carbon dioxide was exchanged with air, in the marble-filled bucket there were preferential pathways, through which water and therefore gas moved, leaving CO_2 in the spaces through which water did not flow. It is necessary to create a displacement condition. Therefore the GeoMat™ should not be buried too deeply, there should be no less than 6-inches of cover, 12-inches recommended as maximum cover. Noel asked if 6-inch cover would present risk of freezing. George did not think it would be a problem; if the effluent is getting to the mat, it should be OK, but if it is not dosed for a while, it will freeze. The temperature within trenches is warmer than the temperature in the space between. In Russ's experience meter pits, if the bottom is open and in natural soil, will not freeze due to less heat loss and the contribution of the heat of the earth. The insulation contributed by grass and thatch was noted; frost rarely penetrates greater than 4-inches beneath grass and thatch.

PSND and BSF dosing is based on gallons/orifice/dose. In RI with advanced treatment and scheduled servicing, there have been no problems with clogging. Since optimal GeoMat™ performance is achieved when it is operating as a piston pump drawing air in to displace the septic gases, we do not want to overfill it or to wet it every 15-minutes. Dave P likened the wetting and drying necessary to the condition of a wood piling in the tide zone. The part of the piling that is always saturated does not decompose, but rather, the portion that is subjected to wetting and drying. While water may contain dissolved oxygen, it is not at a concentration as high as it is in air. Over a 24-hour interval, 4 – 8 doses are preferred. Dave sets systems to dose four times in a 24-hour interval for good dry-down; with higher BOD, this is more important, noting that if RI has a dosing parameter for the PSND that works, he does not want to re-invent the wheel for GeoMat™ and recommends that the same dosing be used in RI with GeoMat™.

When Dave has installed it in fill in CT, they have used ASTM C-33 sand and have not had problems with this. However, if offered the option to install GeoMat™ on CT-select fill or on a Bridgehampton loam, he would choose the loam; it provides better treatment.

Dave Potts noted that he prefers trench configuration, rather than a bed and that he likes installing valves and the manifold in the pump tank, because it is not at risk of frost or mower strikes. If we treat GeoMat™ similarly to the PSND, using the same loading rate and we are spacing the PSNDs 2.5-feet on center (18-inchs edge to edge); 5-feet on center for the 39-inch width; the 12-inch width would be spaced 12-inches edge-to-edge. George noted that spacing in RI with advanced treatment would be different than in CT where they are using STE, where you would require as much oxygen as possible.

Joe asked if we would allow STE. Russ replied that he does not think that we would consider allowing use of GeoMat™ with STE at this time, but that we could consider this as an alternative to the PSND which is an easier process.

George asked if GeoMat™ is cost-competitive with the PSND. Dave responded that installation can generally be completed within one hour and that cost saving would be realized on that basis when compared to the labor involved with installation of a PSND. He did not have an estimate of the cost differences of materials. If we conditioned an approval requiring delivery of pipe with drilled orifices and shields installed, could they respond to it? Dave stated that installation of the orifice shields should not be a problem; they have tried to goof it up and have not been able to. To prevent clogging the orifice with glue, the glue is applied to the shield and not to the pipe; this direction would be provided in the installation manual.

Russ noted that the easiest way to deal with GeoMat™ is to treat the 12-inch wide mat as an alternative to PSNDs; the 39-inch wide mat complicates the issue. The 39-inch wide mat could be approved, but with wider spacing, but people probably would not use it. George agreed that the 12-inch wide mat is a suitable alternative to the PSND; advanced treatment should be required and the spacing and loading rates should be the same. He thought that the 39-inch width would make sense with STE with LPP, at a later date.

Maximum slope for GeoMat™ use was discussed. For example: 30% with a specified depth for that grade. It was suggested that we stay with the 5-foot invert perimeter and 3:1 slope to original grade, as is specified in the Sand Filter Guidance Document for PSNDs.

It was suggested that we begin by considering only the 12-inch width and as an equivalent to the PSND, with all the same design parameters, with 2.5-foot spacing on center. Applying the same parameters as PSNDs to GeoMat™ was considered by all to be appropriate, using the infiltrative surface as the point relative to which the cover is specified.

There was considerable discussion about how to install the orifice shields. It was decided that a jig would simplify and speed the process, but that affixing the orifice shields to the pipe would have to be addressed in the installation manual.

There was some discussion about increasing the separation benefit for the PSND and therefore also GeoMat™ based on the treatment potential. However, as the hour is late and there are topics remaining on the agenda, discussion of this topic was deferred until the next meeting. It was suggested that this does not have to delay a decision on GeoMat™, but that it could be communicated to Geomatrix that this specific issue is under consideration for the PSND and any modification made to its design parameters would also apply to GeoMat™.

Motion: Tim made a motion to approve GeoMat™ with the conditions discussed: design parameters as specified for PSNDs; clear orifice shields, 1-inch pipe, 12-inch wide GeoMat™, dose as PSND, ASTM C-33 sand as specified for PSNDs, orifice size and spacing same as PSND, pretreatment required, time dosing as PSND.
Second: Dennis seconded the motion.
Discussion: Would GeoMat™ be allowed as a substitution for a PSND where a PSND is specified in an approved permit? All the discussion today supports their equivalence and ADS pipe was allowed as a substitution for the PIP pipe dome in a PSND. The OSI AX was allowed to be installed in place of the RX when RX was specified in an approved plan by submission of an affidavit; there were many problems with this process however and the AX for RX substitution was necessitated by OSI's discontinuation of the RX. Redesign was suggested, but no determination was made.

If training is to be required, who needs to be trained? George suggested that the Training Center offer a four hour class on the changes to drainfields, including pressurized drainfields, LPP and PSND; he added that GeoMat™ installation will be easy for anyone who has been installing PSNDs. Russ stated that ordinarily we require training for all technologies; to not require training for GeoMat™ would be a significant deviation.
Vote: All present voted in favor of the motion.

Separation to water table will be on the draft agenda for the next meeting.

Siegmund Environmental Services, Inc. (SESI) Singular Application for Nitrogen Removal
Deb explained that the material from SESI is supplemental to the application submitted March 2 2007. The supplemental information was submitted at DEM's request (letter from DEM to SESI dated May 12, 2009) based on TRC comments at the April 2, 2009 meeting. In addition to the material from SESI, Deb provided a data summary to refresh the memory of the group concerning the nitrogen removal performance of the technology. She also explained that the difference between this technology and the one that was considered years ago is that this one recirculates.

The group considered the data and although a couple of the individual installations' averages exceed 19 mg/L TN, the systems' collective average is below 19 mg/L and therefore is demonstrated by these data to perform to the required standard.

There was discussion of time dosing this type of treatment system. Russ suggested that we treat that issue separately and address it at the next meeting.

Motion: Tim Stasiunas made a motion to approve the SESI's Singulair for nitrogen removal, in the treatment category of 19 mg/L TN in treated effluent, with a maximum design flow of 1,999 gpd.
Second: Dennis seconded the motion.
Discussion: There was no discussion.
Vote: Joe Frisella abstained. Noel Berg, Dennis Vinhateiro, Susan Licardi, George Loomis, Tim Stasiunas and Jim Boyd voted in favor of the motion. Dave Burnham who had left the meeting was not present to vote.

Adjournment
Motion: Dennis made a motion to adjourn.
Second: Joe seconded the motion.
Discussion: There was no discussion.
Vote: All present voted in favor of the motion.

Next Meeting
The next meeting will be scheduled using Doodle, for sometime during the last two weeks of August. Deb will send the Doodle link before the end of this week.

The meeting adjourned at 12:25 PM.