

Subsurface Sewage Treatment Systems (SSTS) Technical Advisory Panel (TAP) for Product Registration

Meeting Notes – January 22, 2009

MPCA St. Paul Office Board Room West

Meeting Attendees

Committee Members	Present on January 22	Guests	Present on January 22
Ed Kerzinski	x	Jeff Iverson, Infiltrator	x
Mitch Johnson		Carl Thompson, Infiltrator	x
Loren Kohnen	x	Dick Bachelder, ADS/Hancor	x
Kemp Ritter		Mike Sundberg, Bord Na Mona	x
Sara Christopherson	x	Ron Suchecki, Hoot	x
Chad Viland		Tony Birrittieri, Peterson Supply	x
Bob Whitmyer	x	Ben Berteau, Ring Industrial Group	x
Greg Halling	x	Bennette Burks, Consolidated Industries	x
Joe Enfield			
Vacant			
MPCA Staff			
Barb McCarthy	x	Bill Priebe	x
Gretchen Sabel	x		
Mark Wespelal	x		
Brett Ballavance			
Leah Hedman, Attorney General Office	x		

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December 12, 2009 Meeting Notes – review and Approve

Motion to approve minutes, Halling, second Kerzinski. Unanimous.

Website Update, SSTS Advisory Committee Feedback on Drainfield Rock Document and Next Steps

Barb McCarthy reviewed proposed MPCA website layout and related documents. Comment on the Rock Guidance document – need to get the word out to all gravel pits and need to do some outreach beyond the members of the Aggregate and Ready-Mix Association of Minnesota (ARM). MPCA agreed to look into this.

Proprietary Distribution Media

Carl Thompson with Infiltrator provided some additional information (see powerpoint presentation). Question – soil intrusion in Infiltrator installation experience. Answer - this occurred in very fine soils with no structure (blow sand); Infiltrator dealt with this by developing an installation spec that fabric cover would be required in this setting. Question – sizing – data was combined that included 1:1 systems and systems installed at the 40% reduction allowed as Warrantied? Answer - Yes.

Ben Berteau with Ring Industrial Group presented information on mound design. They have re-thought the application of proprietary distribution technologies since the last presentation. For mounds, they are now requesting up to a 10% reduction on the width (so that three - 3 ft wide products equals one – 10 ft rock bed) and up to a 10% reduction in product length (a net reduction of 19%). For at-grades, they would request a simple 25% reduction. Question – will water flow from one chamber to another when placed side by side in an at-grade if a pressure lateral was installed in only one of the three chambers? Answer – they should be connected. But wouldn't this result in overloading of the bottom trench? Pressure would be better. Discussion of linear loading rate. Comment – so the equivalency factor for a mound would be 1.23. Answer – yes.

Carl Thompson with Infiltrator then distributed a revised draft Recommended Standards & Guidance Document (RS&G) for synthetic media. Chair Whitmyer then noted that the manufacturers have provided two good presentations and other supplemental material. Their request for an equivalency factor is based on the fact that embedment and fines in aggregate systems reduce the amount of infiltration that occurs. The material that was presented includes both juried and non-juried articles. The juried articles are either based on bench studies or failure studies and for the most part do not look at long-term performance. The three arguments that have been offered in support of downsizing are embedment, fines and that other states allow it.

The question to answer is does the information provided support use of an equivalency factor. There are three types of data in the papers – modeling, bench tests, and failure analysis. Many studies were loaded at a high loading rate to simulate long term performance. But does this actually simulate long-term performance? There is not an agreed-upon protocol to be followed for side by side testing, which is what is really needed. Comment by Carl Thompson with Infiltrator – This TAP is not the first TAP-like group to address this issue. Others have decided in favor of an equivalency factor. Comment – Dick Bachelder with ADC/Hancor – the State of Maine has consistently used and reaffirmed chambers at 50% reduction in sizing.

Chair Whitmyer provided a summary of the documentation. The documents indicate that embedment and fines can impact aggregate system efficiency. The Keyes paper did show differences of a 5-10% increase in infiltration for open bottom media, however, the hydraulic gradient for these products was 6% higher than for the aggregate systems, so this is inconclusive. The Walsh study was good research but documents effects at extreme level of embedment. The Lowe field scale study used a higher rate based on maximum mass loading theory of system lifespan. Question whether this is valid since resting

is important to keeping systems working effectively. Extrapolation of the resulting model predicts a four year life for aggregate systems, which Minnesota experience has shown is not the case.

Amerson's report demonstrated a 5% reduction in Ksat due to fines; again, loading was artificially high. White used sand with 1% fines – Ksat loading rate was 7-9 times the rates allowed in Minnesota. Regarding failure studies – these generally don't measure flow, which is a critical flaw. Unless you are measuring flow, you can't use a failure analysis to prove that reduction is not an impact on performance. In the King study, all were designed on 450 gpd, yet most households were only 3 persons. That is, systems in the study likely received no more than one-half of their design flow.

Comment – Carl Thompson with Infiltrator regarding the Keyes study – need to remember that this was with clean water, which performs differently in terms of development of a clogging mat. Question – is the reduction proposed only for septic tank effluent (not pretreated)? Answer – Carl Thompson – yes.

Chair Whitmyer summarized his comments, saying that while there are studies indicating that embedment and fines are problems, we don't have field experience that shows us this. Minnesota's loading rates were developed and revised over time based on research and experience. The early Bouma work related loading rates to soil types and is still valid today. Many factors went into these loading rates. We are talking about tweaking loading rates that may already consider the impacts of embedment and fines – thus removing any associated safety factors. Actual scientific proof is needed, not just information that other regulators are allowing reductions. TAP is evaluating the science only that was submitted with this request.

Comment – Carl Thompson with infiltrator – If you were able to compare gravel systems sized at 1000 feet vs gravel systems sized at 500 feet at 6 years, 12 years, 24 years, you would see a difference. The King study was done in Oregon, where systems are ½ the size of Minnesota systems. A failure study here shows that reductions are acceptable. The one study that actually does prove this is the Lowe field study. Mr. Thompson further stated that the Lowe study was built to be a simulation of actual trenches, and that it should be viewed as more than a bench test. Comment – Christopherson with the University of Minnesota – the Lowe study raised more questions for her. It took much longer for the rock trench to reach the end state (failure) at the 4 cm/day rate; she questions whether the 8 cm/day rate actually is realistic. Carl Thompson didn't agree, he feels that the 8 cm/day rate is applicable in Minnesota. Comment – Dick Bachelder with ADS/Hancor – they are being asked to justify their reduction against a moving target since states are constantly changing loading rates for rock, and without scientific justification.

Comment – Dick Bachelder with ADS/Hancor – Minnesota is ahead of other states in that we have a rock guidance document. The problem with Dr. Seigrist's work is that it's only one soil type. Minnesota's TAP needs to consider the risk. Does a 25% reduction actually raise the risk level to an unacceptable level? Comment – Ed Kerzinski – there wasn't anything in these studies that definitively proved downsizing is OK, or that downsizing is a problem or is not a problem in the short term. St. Louis County has been looking at longevity for years, and this is why they reduced loading rates, and failure rates for

mounds have dropped. They now pressurize their trenches, which has greatly increased longevity. He is not at all comfortable with downsizing trenches in heavy soils or in mounds. Comment Loren Kohnen – agrees with Mr. Kerzinski. Size is a key factor in longevity, this is the main concern. He does not see justification for downsizing. Comment letter was sent in by Chad Viland – see attached. Comment Whitmyer – enforcement of the rock guidance is likely to increase the price competitiveness of synthetic media. Concern – Christopherson – the 40% downsized with Warrantied is really a concern. There would be less risk in the 25% reduction.

Comment – Carl Thompson with Infiltrator – there is a 2004 memo from Mark Wespetal that recommends a 28% reduction for chambers. Gretchen Sabel agreed to make copies of this document for the attendees. This issue will be discussed at the February 19th meeting before the TAP makes a decision and provides a recommendation.

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Lunch

The panel broke for lunch and the media manufacturer's representatives departed.

After lunch, the spreadsheet that Mr. Thompson referred to earlier was distributed. Mark Wespetal provided some comments to the group. He explained that this spreadsheet is an internal MPCA discussion document, not an official MPCA policy. The spreadsheet was, however, distributed at a meeting with media manufacturer's several years ago. The analysis was developed based on Mark's professional judgment, not actual testing data or engineering calculations. He noted that the concept of rock shadow was included in the attached table not because MPCA agrees that rock shadow is a concern, rather it was included just to show what rock shadow's impact might be if it were an issue. When reviewing the spreadsheet, TAP members should remember that the rock trench width in the table is 30 inches, not 36 inches. This was done for comparability purposes to the 30 inch wide chamber products.

Consolidated Treatment Systems

A presentation was made by Bennette Burks, representing Consolidated Treatment Systems. Mr. Burks explained how Multi-Flow's treatment device works. Question – how often should the socks be washed? The settlability test should be performed every six months. If it exceeds 50%, the system should be cleaned. Performance should be watched. Anytime the system is pumped, it's good to replace the socks. Service providers launder the socks and reuse them. Flow distribution is left up to designers. Question – how many of each of these products are installed in Minnesota? Answer – there are about 200 Multi-flows, very few Nyadics. Question – are there applications where Nyadic is preferred over Multiflow? Answer – the Enviro-Guard system is effective at nitrogen reduction of up to 60% and it is used a lot in Florida. Maintenance is easier for the Nyadics; it's a matter of preference. The Multi-flow provides more consistent treatment because it is a fixed-film process.

Question – do you have testing data that documents fecal reductions? Answer - Yes, but just for the EnviroGuard. The company also sampled 50 Multi-flow systems for a month in Ohio and then submitted the bacteria testing. Question – does Nyadic have a product for high-strength waste? They manage it

by adding more air; both products have information on high strength waste. Question – are they similar in cost? Answer – Multi-flow costs about \$500 more, and maintenance costs more. Question – is a primary tank needed? Answer – this has been a bone of contention... these devices were tested by the National Sanitation Foundation (NSF) without primary treatment. Company policy is that whether to require primary treatment is a private decision between homeowner, installer, and regulator. More discussion; it seems that trash traps are required in Minnesota. Are the test centers using raw sewage? No, all are either screened or pumped so large solids are reduced. If the primary treatment is too large, a weaker influent gets to the treatment unit and then bulking occurs.

Barb McCarthy reviewed the checklist for Multi-Flow. Question – How is Multi-Flow used for high strength waste? Answer - At this point it is being registered for residential applications only.

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Hoot Systems

Ron Suchecki with Hoot Systems provided a copy of the application for his product at Treatment Level B, dated January 20, 2009. These systems are tested with an in-line trash trap because this is integral to the unit. These products offer a longer detention time and consequently greater fecal removal. Fecal testing without UV showed that it consistently met the 10,000 col/100 ml, assuming that MPCA agrees that the testing is equivalent. Comment – Christopherson – indicated the testing appears equivalent. No one on the committee disagreed. Discussion on why there are spikes in the fecal data.

Mr. Suchecki then distributed copies of the application for the Hoot products at Treatment Level A, dated January 21, 2009. He stated that upscaling of UV is covered on pages 40-42 of this document. Question – if two UV disinfection units are used, should they be in series or parallel? Hoot recommends they be connected in series. Also, the UV disinfection units are rated for a flow of 6 gpm for a single unit and 10 gpm for two units, and the unit flows treated effluent to the Salcor at 1 gpm, an additional safety margin.

Question – doesn't performance of the UV degrade over time? Answer – the bulbs have an effective life of about 8000 hours, and regular maintenance is required. Discussion occurred on the maintenance of the UV disinfection unit.

Mr. Suchecki will send two additional pieces of information – a regulator checklist and a recommended installation design that will show a cover over the blower. Barb McCarthy will review this and ensure that all the required parts are covered.

Operating Permit Template

Sara Christopherson, Joe Enfield and Barb McCarthy drafted an operating permit template. The supplied example is mocked up for the ECOPOD treatment device with UV disinfection. Barb reviewed the draft with TAP. It will be sent to selected counties and practitioners for comment, and then be forwarded to the SSTS Advisory Committee for their March 12, 2009 meeting. Question – how do Management Plans fit in? Answer – the University of Minnesota is considering changing their Type I Management Plan

templates to include a check box to indicate whether there is a pretreatment unit and to note that the Management Plan for that unit also is part of the document.

Open Forum, Topic 1: Disinfection

Tony Birrittieri (Peterson Supply) - since UV disinfection units are approved only as part of the treatment train, this is a problem. Discussion ensued regarding the mis-match between UV sizing and system sizing. Comment – the rule does not allow for use of equivalent UV products. As the rule is written, the rule does not allow for other UV products or other disinfection methods. It would be good for the rule to allow a method for testing of disinfection products separately. Question – would NSF be willing to issue equivalency? Not likely. Check to see if Wisconsin is allowing UV units at higher flows. Comment – Gretchen Sabel – the rule will need to be changed if we wanted to have a way to swap out UV or other disinfection. MPCA staff will consider this and bring it to the TAP at the February meeting.

Open forum, Topic 2: High Strength Waste

Sara Christopherson indicated that there is a problem; no products have been certified through the Environmental Technology Verification (ETV) testing protocol for High Strength Waste (HSW). Discussion followed. One possible way to handle this would be for the product vendor to certify that the design using their product is suitable for the waste, and then to have follow up monitoring to verify operation. A member noted an example where an approval like this was problematic. In addition to monitoring, there should be an upfront requirement for some level of third party testing to demonstrate baseline performance of the units. Illinois requires that the vendor have 15 systems in the state that are being monitored before they can apply for certification.

One option may be to collect data from manufacturers and other sources and have a third-party analyze this data. Mr. Birrittieri with Peterson Supply suggested that a subcommittee of the TAP be formed to consider this issue. Sara Christopherson volunteered to serve on this committee. There was a discussion of variability in wastes, and the problems that variable operation within the business affects wastewater strength. Next steps – Conference call Friday 1-23-09 at 3 pm to start things off.

Meeting adjourned at 4:20pm. Next meeting will be February 19, 2009 in Conference Room 2A and 2B at MPCA's St. Paul offices.