State of Idaho
Department Of Environmental Quality
Technical Guidance Committee

# Technical Guidance Committee Meeting

# Agenda*

Thursday August 20, 2015

***9:30 a.m. – 12:00 p.m.***

**Department of Environmental Quality**
**Teleconference**

9:30 AM Call to Order/Roll Call
- Introduction of committee members, guests, and attendees

9:35 AM Open to Public Comment – 15 minutes reserved for the public to provide comments to the TGC on subjects not on the agenda, if no public comment is presented at the start of comment period the agenda will move forward

9:50 AM 1.4.2.2 Extended Treatment Package System Product Approvals (**Appendix A**) **
- Review for preliminary approval

10:20 AM 5.4 Extended Treatment Package Systems (**Appendix B**)
- Review for preliminary approval

10:35 AM 5.13 Total Nitrogen Reduction Approvals (**Appendix C**)
- Review for preliminary approval

10:50 AM 1.4.2.4 Proprietary Wastewater Treatment Product Approval Policy (**Appendix D**)
- Review for preliminary approval

11:20 AM 5.14 Proprietary Wastewater Treatment Products (**Appendix E**)
- Review for preliminary approval

11:35 AM Final TGC Recommendation Regarding Proposals for Orenco AdvanTex and Bio-Microbics BioBarrier Products (**Appendix F**)
- Review for final recommendation

12:00 PM Adjourn
- Meeting may adjourn early dependent upon discussion, interest, and participation for each agenda item

*Begin and end time will be observed. Agenda items and their allotted times my vary dependent upon the amount of interest and participation for each item.

** Agenda appendices starting at Appendix B are color coded to track changes. Blue text indicates changes that were made in previous Technical Guidance Committee (TGC) meetings. Red text indicates changes that are newly proposed for this TGC meeting. All green text indicates text that was moved from one area of a section to the new area. ~~All text with strikeout markings regardless of color is either proposed to be deleted from the guidance or moved to another location within that section.~~

## The call in number is (208) 373-0101 Bridge # 1

### *To Join a Conference Call*

**1) Auto-Attendant Transfer Option**

Conference Call Auto-Attendant Number:

- Extension 0101: Inside DEQ phone system
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Participants call auto-attendant number and are then prompted to enter their pre-arranged conference call bridge number and in this case press the number **1**. Once the bridge number has been entered, callers are automatically connected to their conference call.

### *Notification*

As participants are added to a conference call, an audible chime is heard by participants already connected to the call. If the conference is in progress when the chime is sounded, it is advisable to acknowledge the new participant and ask who has joined the call. This will ensure that the new caller has gained access to the proper call.

## HP MyRoom Instructions

### *To Join HP MyRoom*

This will allow users joining the meeting via online video conference to view the same computer material that the subcommittee members are seeing at the meeting location. To hear audio users will still need to call the conference call number above from their telephone. Login information is below.

**1) Visit the Website Below**

- https://www.myroom.hp.com/attend/MEP4NKMUMDA
- Enter your first and last name in the area provided
- Enter the room key: MEP4NKMUMDA

**Appendix A**

### *1.4.2.2 Extended Treatment Package System Approvals*

Extended treatment package systems (ETPS) are required to undergo two levels of approval in Idaho (IDAPA 58.01.03.009.03). The first level of approval is provisional approval based upon a manufacturer's submitted literature and data that support the treatment claims for the product. The second level of approval is general approval based upon a manufacturer's proven performance after installation and operation in Idaho. Upon receiving provisional approval a manufacturer must proceed to obtain general approval within a specified timeframe otherwise the product will be disapproved.

#### 1.4.2.2.1 Provisional ETPS Approval

Provisional ETPS approval allows a manufacturer's unit to be installed by a property owner but the system must undergo annual operation, maintenance, monitoring, and reporting performed by an approved service provider and third party tester. Operation, maintenance, monitoring, and reporting are the responsibility of the manufacturer under provisional approval.

Manufacturers seeking provisional approval of an ETPS technology shall submit product information to the DEQ on-site wastewater coordinator for review by DEQ. In addition to product information (i.e., engineering designs and product manuals), manufacturers must submit NSF/ANSI Standard 40 ~~and 360~~ approvals, reports, and associated data or equivalent third party standards. Manufacturers also seeking approval on the ETPS units for reduction of total nitrogen (TN) must submit NSF Standard 245 approvals, reports, and associated data or equivalent third party standards. Equivalency determinations of third party standards shall be made by DEQ on a case-by-case basis. All third-party standards evaluated for the ETPS model must be submitted including approvals, disapprovals, reports, and associated data. ETPS models that have not undergone third-party testing and wish to be approved for reduction in TSS, $CBOD_5$, and TN must be permitted and installed under the guidance in Section 4.7, "Experimental System."

Manufacturer's shall also submit as part of their request for provisional approval a quality assurance project plan to document how sampling and analysis will occur under provisional approval and identify who will perform both the sampling and analysis. All operation and maintenance performed during the provisional approval stage shall be done by a service provider approved by DEQ. All effluent testing performed during the provisional approval stage shall be done by a third party contracted by the manufacturer with experience in wastewater sampling. The service provider and effluent tester may not be the same individual or work for the same company. The manufacturer seeking approval and third party tester will be responsible for obtaining property access for testing of their system's effluent during the provisional approval stage. The manufacturer shall also be responsible for effluent testing costs.

All ETPS manufacturers that obtain provisional approval for one of their products must attempt to gain general approval and shall follow the minimum operation, maintenance, and effluent testing procedures outlined in section 4.8.3. Upon receiving provisional approval for an ETPS model a manufacturer must install that specific ETPS model within two years. If installation of the provisionally approved product does not occur within two years of the provisional approval the ETPS model shall be disapproved (IDAPA 58.01.03.009.04). Once a manufacturer's ETPS

model is installed under provisional approval operation, maintenance, and monitoring of that unit as described in the manufacturer's quality assurance project plan and section 4.8.3 must begin that same reporting year unless that system was installed less than three weeks prior to the reporting deadline. Additionally, if operation, maintenance, and monitoring of the provisionally approved unit is not submitted to DEQ for any year after initial installation under provisional approval the ETPS model shall be disapproved. Installed products under provisional approval that are disapproved shall be replaced by the manufacturer with a system that meets the installation requirements of the specific site that the ETPS model is installed at.

#### 1.4.2.2.2 General ETPS Approval

General ETPS approval allows a manufacturer's unit to be installed by a property owner without the requirement to sample effluent on an annual basis for systems that are not required to obtain a TN level < 27 mg/L. The property owner must still have their ETPS unit undergo annual operation, maintenance, and reporting performed by an approved service provider.

To obtain general approval, or to lower reduction levels from those set in a general approval for any constituent, the ETPS model manufacturer must submit data from ETPS models installed in Idaho. The data submitted must be obtained through operation, maintenance, and monitoring protocols described in section 1.4.2.2.1 under a DEQ accepted quality assurance project plan. Data from other states will not be considered under this approval process. Any data submitted must be specific to a particular ETPS make and model. Data submission must include information on 30 installations with a minimum of 3 full years of operational data on each system, or the equivalent number of data points obtained on an annual basis for a lesser number of installations. All maintenance and effluent testing records, as described in section 4.8.3, obtained over this period must be submitted for review.

DEQ will issue general approval of an ETPS product in conjunction with associated reduction levels for TSS, $CBOD_5$, and TN. TSS and $CBOD_5$ reduction levels will be set at less than or equal to 45 mg/L and 40 mg/L respectively based on the data showing that 90% of the installed units have successfully maintained effluent reduction levels at or below 45 mg/L TSS and 40 mg/L $CBOD_5$. TN Reduction levels will be determined through statistical analysis of the data submitted. The submitted data will be statistically evaluated to determine a resulting value that corresponds to a 95% upper confidence limit. The resulting value that corresponds to the 95% upper confidence limit will be used as the system's TN performance limit. Third-party report average reduction values will not be accepted to establish system performance approvals for any constituent.

For adjustment in reduction levels of effluent constituents from a current general approval level to be approved a manufacturer must submit data as described in section 1.4.2.2.1 that was obtained through a DEQ accepted quality assurance project plan. Adjustments shall be made based on data analysis described in section 1.4.2.2.2 except that the data must be obtained over a period of at least two years regardless of the number of data points and must be obtained for all of the specific ETPS models installed in Idaho that the adjustment is being requested for.

**Appendix B**

## 5.4 Extended Treatment Package Systems

Revision: ~~May 21~~August 20, 2015

Table 5-3 lists extended treatment package systems ~~certified~~approved by DEQ for provisional use. Table 5-4 lists extended treatment package systems approved by DEQ for general use. Provisional use approval requires that manufacturers follow specific operation, maintenance, and monitoring protocols to obtain general use approval (see section 1.4.2.2.1). General use approval allows manufacturers ETPS units to be installed following specific operation and maintenance protocols (see section 1.4.2.2.2).

**Table5-3. Extended treatment package systems ~~certified~~approved by DEQ for provisional use.**

| Manufacturer and Model ~~Aerobic Treatment Device (Std 40)~~ | Treatment Limit (GPD) ~~Gallons per day~~ | Third Party Standards (TPS) or Experimental ~~$BOD_5$ Removal~~ | ~~Total Suspended Solids Removal~~ | Operation, Maintenance, and Monitoring Provider ~~Trench Size~~ | ~~Certification~~Approval Date |
|---|---|---|---|---|---|
| A-Aerobic-1, LLC<br>A-Aerobic-1 Class I | 500 | TPS<br>~~Ave. 21 mg/L~~ | ~~Ave. 26 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 10/14/02 |
| Advanced Septic Treatment System<br>TRD-1000-500 Class I<br>TRD-1000-600 Class I<br>TRD-1000-700 Class I<br>TRD-1000-800 Class I<br>TRD-1000-900 Class I<br>TRD-1000-1000 Class I | 500<br>600<br>700<br>800<br>900<br>1,000 | ~~—~~<br>TPS | ~~—~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 11/3/03 |
| Aero-Tech Aerobic Treatment Units<br>AT-500 Class I<br>AT-600 Class I<br>AT-750 Class I<br>AT-1000 Class I<br>AT-1500 Class I | 500<br>600<br>750<br>1,000<br>1,500 | ~~—~~<br>TPS | ~~—~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 11/26/08 |

| Manufacturer and Model ~~Aerobic Treatment Device (Std 40)~~ | Treatment Limit (GPD) ~~Gallons per day~~ | Third Party Standards (TPS) or Experimental ~~$BOD_5$ Removal~~ | ~~Total Suspended Solids Removal~~ | Operation, Maintenance, and Monitoring Provider ~~Trench Size~~ | ~~Certification~~Approval Date |
|---|---|---|---|---|---|
| Alternative Wastewater Systems Inc.<br>SYBR-AER Class I<br>SYBR-AER Class I<br>SYBR-AER Class I<br>SYBR-AER Class I<br>SYBR-AER Class I | 500<br>600<br>800<br>1,000<br>1,500 | ~~—~~<br>TPS | ~~—~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 11/3/03 |
| American Wastewater Systems Inc.<br>BEST 1 AWS-500 Class I<br>BEST 1 AWS-800 Class I<br>BEST 1 AWS-1000 Class I<br>BEST 1 AWS-1200 Class I<br>BEST 1 AWS-1500 Class I | 500<br>800<br>1000<br>1,200<br>1,500 | ~~—~~<br>TPS | ~~—~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 11/03/03 |
| Aquapoint<br>Bioclere 16/12/500: Class I | 500 | ~~Ave. 11 mg/L~~<br>TPS | ~~Ave. 13 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 3/19/91 |
| Aquarobic International<br>Mini-Plant 54291 Concrete Filter Kit [1]: Class I<br>Mini-Plant 54291 Fiberglass Class I | 500 to 1,500 in 100 gal units | ~~Ave. 7 mg/L~~<br>TPS | ~~Ave. 11 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 11/03/03 |
| ~~Bio-Microbics®, Inc.<br>RetroFAST® 0.375: Class I~~ | ~~375~~ | ~~—~~ | ~~—~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | ~~—~~ |

| Manufacturer and Model ~~Aerobic Treatment Device (Std 40)~~ | Treatment Limit (GPD) ~~Gallons per day~~ | Third Party Standards (TPS) or Experimental ~~$BOD_5$ Removal~~ | ~~Total Suspended Solids Removal~~ | Operation, Maintenance, and Monitoring Provider ~~Trench Size~~ | ~~Certification~~Approval Date |
|---|---|---|---|---|---|
| ~~Bio-Microbics®, Inc.~~ | | | | Service Provider and Third Party Tester ~~Intermittent sand filter drainfield~~ | |
| ~~BioBarrier® MBR 0.4 Class I~~ | ~~400~~ | | | | |
| ~~BioBarrier® MBR 0.4-N Class I~~ | ~~400~~ | | | | |
| ~~BioBarrier® MBR 0.5 Class I~~ | ~~500~~ | | | | |
| ~~BioBarrier® MBR 0.5-N Class I~~ | ~~500~~ | — | — | | — |
| ~~BioBarrier® MBR 1.0 Class I~~ | ~~1,000~~ | | | | |
| ~~BioBarrier® MBR 1.0-N Class I~~ | ~~1,000~~ | | | | |
| ~~BioBarrier® MBR 1.5 Class I~~ | ~~1,500~~ | | | | |
| ~~BioBarrier® MBR 1.5-N Class I~~ | ~~1,500~~ | | | | |
| ~~Bio-Microbics®, Inc~~ | | | | Service Provider and Third Party Tester ~~Intermittent sand filter drainfield~~ | |
| ~~MicroFAST® 0.5 Class I~~ | ~~500~~ | | | | |
| ~~MicroFAST® 0.75 Class I~~ | ~~750~~ | ~~92%–95%~~ | ~~95%–97%~~ | | ~~3/5/97~~ |
| ~~MicroFAST® 0.9 Class I~~ | ~~900~~ | ~~Ave. 11 mg/L~~ | ~~Ave. 16 mg/L~~ | | ~~6/5/00~~ |
| ~~MicroFAST® 1.5 Class I~~ | ~~1,500~~ | | | | ~~12/27/02~~ |
| Busse Innovative Systeme GmbH | | | | Service Provider and Third Party Tester ~~Intermittent sand filter drainfield~~ | |
| MF-B-400 | 400 | — TPS | — | | 7/7/09 |

| Manufacturer and Model ~~Aerobic Treatment Device (Std 40)~~ | Treatment Limit (GPD) ~~Gallons per day~~ | Third Party Standards (TPS) or Experimental ~~$BOD_5$ Removal~~ | ~~Total Suspended Solids Removal~~ | Operation, Maintenance, and Monitoring Provider ~~Trench Size~~ | ~~Certification~~Approval Date |
|---|---|---|---|---|---|
| Clearstream Wastewater Systems | | | | Service Provider and Third Party Tester ~~Intermittent sand filter drainfield~~ | |
| Model 500 N/C Class I | 500 | ~~95%–97% Ave. 14 mg/L~~ TPS | ~~93%–98% Ave. 48 mg/L~~ | | 3/28/96 |
| Model 600 N/C Class I | 600 | | | | |
| Model 750 N/C Class I | 750 | | | | |
| Model 1000 N/C Class I | 1,000 | | | | |
| Model 1500 N/C Class I | 1,500 | | | | |
| Consolidated Treatment System Inc. | | | | Service Provider and Third Party Tester ~~Intermittent sand filter drainfield~~ | |
| Multi-Flo FTB: Class I 0.5, 0.6, 0.6-C, 0.75, 1.0, 1.5 | 500 to 1,500 | ~~96%–97% Ave. 5 mg/L~~ | ~~97%–98% Ave. 6 mg/L~~ | | 4/2/96 |
| Nayadic M: Class I 6A, 8A, 1050A, 1200A, 2000A | 500 to 1,500 | ~~96%–97% Ave. 6 mg/L~~ TPS | ~~96%–98% Ave. 7 mg/L~~ | | 4/2/96 |
| Delta Env. Products | | | | Service Provider and Third Party Tester ~~Intermittent sand filter drainfield~~ | |
| DF40-C, F, CC, CA, FF-Class I | 400 | ~~95%–98% Ave. 6 mg/L~~ TPS | ~~96%–97% Ave. 7 mg/L~~ | | 2/3/97 |
| DF50-C, F, CC, CA, FF-Class I | 500 | | | | |
| DF60-C, F, CC, CA, FF-Class I | 600 | | | | |
| DF75-C, F, CC, CA, FF-Class I | 750 | | | | |
| DF100-C, F, CC, CA, FF-Class I | 1,000 | | | | |
| DF150-C, F, CC, CA, FF-Class I | 1,500 | | | | |
| Desoto Concrete Products | | | | Service Provider and Third Party Tester ~~Intermittent sand filter drainfield~~ | |
| H-Two-O Series: Class I | 500 | — TPS | — | | 11/3/03 |
| | 750 | | | | |
| | 1,000 | | | | |
| Ecological Tanks, Inc. | | | | Service Provider and Third Party Tester ~~Intermittent sand filter drainfield~~ | |
| AA, AS 500 Class I | 500 | ~~AA Ave. 2.0 mg/L AS Ave. 2.0 mg/L~~ TPS | ~~AA Ave. 2.2 mg/L AS Ave. 1.6 mg/L~~ | | 11/1/97 5/2/02 |
| AA, AS-650 Class I | 650 | | | | |
| AA, AS-750 Class I | 750 | | | | |
| AA, AS-100 Class I | 1,000 | | | | |
| AA, AS-1500 Class I | 1,500 | | | | |
| Enviro-Flo: Class I | | | | Service Provider and Third Party Tester | |
| E-500, E-550 | 500 | ~~Ave. 14 mg/L~~ | ~~Ave. 15 mg/L~~ | | 12/18/02 |

| Manufacturer and Model ~~Aerobic Treatment Device (Std 40)~~ | Treatment Limit (GPD) ~~Gallons per day~~ | Third Party Standards (TPS) or Experimental ~~$BOD_5$ Removal~~ | ~~Total Suspended Solids Removal~~ | Operation, Maintenance, and Monitoring Provider ~~Trench Size~~ | ~~Certification~~Approval Date |
|---|---|---|---|---|---|
| E-550<br>E-600<br>E-750<br>E-1000 | 550<br>600<br>750<br>1,000 | TPS | | ~~Intermittent sand filter drainfield~~ | |
| H.E. McGrew, Inc. Class I<br>Alliance 500, 750, 1000<br>Mighty Mac, 500, 600, 750<br>Cajun Aire Basic 500, 750, 1000<br>Cajun Aire Advanced, 500, 750, 1000 | 500<br>to<br>1,000 | ~~96.5%~~<br>~~Ave. 7 mg/L~~<br>~~Ave. 13 mg/L~~<br>TPS | ~~97.2%~~<br>~~Ave. 13 mg/L~~<br>~~Ave. 19 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 6/5/00<br>12/5/97<br>12/30/02 |
| Hoot Aerobic Systems, Inc. Class I<br>H 500, 600, 750, 1000<br>LA 500, 1000 | 500<br>to<br>1,000 | ~~Ave. 3.2 mg/L~~<br>TPS | ~~Ave. 3.6 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 2/6/01 |
| Hydro-Action, Inc.: Class I<br>AP-500, 600, 750, 900, 1500 | 500 to<br>1,500 | ~~Ave. 9 mg/L~~<br>TPS | ~~Ave. 15 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 4/2/96<br>3/99<br>8/1/03 |
| Jet Inc.: Class I<br>J-500, J-600<br>J-750,1000, 1250, 1500 | 500<br>600<br>750–1,500 | ~~88%–96%~~<br>~~Ave. 15 mg/L~~<br>TPS | ~~91%–97%~~<br>~~Ave. 12 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 10/96<br>5/93<br>7/29/97 |
| MICROSEPTEC: Class I<br>Enviroserver, ENFG 600, 1200, 1500 | 600<br>1,200<br>1,500 | ~~Ave. 6 mg/L~~<br>TPS | ~~Ave 8 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 6/25/99 |
| National Wastewater Systems Inc.,<br>Solar Air 500, 800, 1000, 1200 | 500<br>800<br>1,000<br>1,200 | ~~Ave. 13 mg/L~~<br>TPS | ~~Ave. 19 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 8/1/03 |
| Norweco, Inc. | | | | Service Provider and | |

| Manufacturer and Model ~~Aerobic Treatment Device (Std 40)~~ | Treatment Limit (GPD) ~~Gallons per day~~ | Third Party Standards (TPS) or Experimental ~~$BOD_5$ Removal~~ | ~~Total Suspended Solids Removal~~ | Operation, Maintenance, and Monitoring Provider ~~Trench Size~~ | ~~Certification~~Approval Date |
|---|---|---|---|---|---|
| Singulair 950 series Class I<br>Singulair 960 series Class I<br>Singulair TNT | 600–1,500<br>500–1,500<br>500-1,500 | ~~>85%~~<br>~~Ave. 6 mg/L~~<br>~~Ave. 4 mg/L~~<br>TPS | ~~>85%~~<br>~~Ave. 10 mg/L~~<br>~~Ave. 9 mg/L~~ | Third Party Tester<br>~~Intermittent sand filter drainfield~~ | ~~4/3/96~~<br>~~8/96~~<br>~~8/08~~ |
| ~~Orenco Systems Inc.~~<br>~~AdvanTex AX20N~~<br>~~AdvanTex AX20-RT~~<br>~~AdvanTex AX15-2N~~<br>~~AdvanTex AX20-2N~~<br>~~AdvanTex AX15-3N~~<br>~~AdvanTex AX20-3N~~<br>~~AdvanTex AX25-RT3N~~ | <br>~~500~~<br>~~500~~<br>~~800~~<br>~~1,000~~<br>~~1,200~~<br>~~1,500~~<br>~~625~~ | ~~Ave. 5 mg/L~~ | ~~Ave. 4 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | <br><br>~~4/10/02~~<br><br>~~3/1/10~~<br><br>~~6/11/12~~ |
| Pro Flo Aerobic Systems<br>Pro Flo 500 TL<br>Pro Flo 750 SL<br>Pro Flo 1000 TC | <br>500<br>750<br>1,000 | ~~—~~<br>TPS | ~~—~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | ~~11/3/03~~ |
| Rogers Treatment Systems<br>Mudbug 5<br>Mudbug 10<br>Mudbug 15 | <br>500<br>1,000<br>1,500 | ~~Ave. 15 mg/L~~<br>TPS | ~~Ave. 22 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | ~~11/3/03~~ |
| Southern Manufacturing<br>SM-500 Class I<br>SM-600 Class I<br>SM-750 Class I<br>SM-1000 Class I<br>SM-1500 Class I | <br>500<br>600<br>750<br>1,000<br>1,500 | ~~98.7%~~<br>~~Ave. 2.0 mg/L~~<br>TPS | ~~98.1%~~<br>~~Ave. 1.8 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | ~~9/1/97~~<br>~~8/28/00~~ |
| SeptiTech<br>M400/M400D<br>M550/M550D<br>M750/M750D<br>M1200/M1200D | <br>300<br>400<br>500<br>1,200 | ~~Ave. 12 mg/L~~<br>TPS | ~~Ave. 5 mg/L~~ | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | ~~12/09~~ |

| Manufacturer and Model ~~Aerobic Treatment Device (Std 40)~~ | Treatment Limit (GPD) ~~Gallons per day~~ | Third Party Standards (TPS) or Experimental ~~$BOD_5$ Removal~~ | ~~Total Suspended Solids Removal~~ | Operation, Maintenance, and Monitoring Provider ~~Trench Size~~ | ~~Certification~~Approval Date |
|---|---|---|---|---|---|
| M1500/M1500D | 1,500 | | | | |
| Zabel Environmental Technology<br>ATS-AD-500: Class I | 500 | —<br>TPS | — | Service Provider and Third Party Tester<br>~~Intermittent sand filter drainfield~~ | 12/02<br>Dropped |

*Notes*: ~~5-day biological oxygen demand ($BOD_5$); milligram per liter (mg/L); average (ave.)~~; gallons per day (GPD)

**Table5-4. Extended treatment package systems approved by DEQ for general use.**

| Manufacturer and Model | Treatment Limit (GPD) | $CBOD_5$ (≤40 mg/L) and TSS (≤45 mg/L) Removal | Operation and Maintenance Provider | Approval Date |
|---|---|---|---|---|
| Bio-Microbics®, Inc.<br>RetroFAST® 0.375: Class I | 375 | Yes | Service Provider | — |
| Bio-Microbics®, Inc.<br>BioBarrier® MBR 0.4 Class I<br>BioBarrier® MBR 0.4-N Class I<br>BioBarrier® MBR 0.5 Class I<br>BioBarrier® MBR 0.5-N Class I<br>BioBarrier® MBR 1.0 Class I<br>BioBarrier® MBR 1.0-N Class I<br>BioBarrier® MBR 1.5 Class I<br>BioBarrier® MBR 1.5-N Class I | <br>400<br>400<br>500<br>500<br>1,000<br>1,000<br>1,500<br>1,500 | Yes | Service Provider | — |
| Bio-Microbics®, Inc<br>MicroFAST® 0.5 Class I<br>MicroFAST® 0.75 Class I<br>MicroFAST® 0.9 Class I<br>MicroFAST® 1.5 Class I | <br>500<br>750<br>900<br>1,500 | Yes | Service Provider | 3/5/97<br>6/5/00<br>12/27/02 |

| Manufacturer and Model | Treatment Limit (GPD) | $CBOD_5$ (≤40 mg/L) and TSS (≤45 mg/L) Removal | Operation and Maintenance Provider | Approval Date |
|---|---|---|---|---|
| Orenco Systems Inc. | | | | |
| AdvanTex AX20N | 500 | Yes | Service Provider | 4/10/02 |
| AdvanTex AX20-RT | 500 | | | |
| AdvanTex AX15-2N | 800 | | | |
| AdvanTex AX20-2N | 1,000 | | | 3/1/10 |
| AdvanTex AX15-3N | 1,200 | | | |
| AdvanTex AX20-3N | 1,500 | | | 6/11/12 |
| AdvanTex AX25-RT3N | 625 | | | |

*Notes*: 5-day carbonaceous biological oxygen demand ($CBOD_5$); total suspended solids (TSS); milligram per liter (mg/L); ~~average (ave.)~~; gallons per day (GPD);

# Appendix C

*This section will replace the current Total Nitrogen Reduction Policy

## 5.13 Total Nitrogen Reduction Approvals~~Policy~~

Revision: ~~August 30, 2012~~ August 20, 2015

On-site wastewater systems that qualify as best practical methods for the targeted nitrogen reduction amount appear in ~~Table 8-1~~Table 5-14. Areas of concern, such as nitrate priority areas, areas with shallow soils over bedrock, or a shallow depth to ground water, may be required to use one of these best practical methods to reduce the development's or home's environmental impact. Values listed in the TN column should not be exceeded to ensure that the required TN reduction percentage is attained. These TN values may be used in NP evaluations to evaluate the impact on ground water resources. Products installed for reduction of TN < 27 mg/L are subject to effluent testing (see section 4.8).

**Table ~~8-1~~5-14. ~~Best practical methods for~~ On-site wastewater systems approved for total nitrogen reduction.**

| System or Manufacturer Product and Model ~~Best Practical Method~~ | Total Nitrogen Reduction[a] (%) | Total Nitrogen[a] (mg/L) | Minimum Source Water Alkalinity[b] (mg/L) | ~~Operations and Maintenance Provider~~ |
|---|---|---|---|---|
| **Public Domain Systems** | | | | |
| Intermittent Sand Filters (ISF) | 15[c] | 38 | 108 | ~~Property owner~~ |
| Recirculating Gravel Filters (RGF) | 40[c] | 27 | 189 | ~~Property owner~~ |
| **Extended Treatment Package Systems** | | | | |
| Busse Innovative Systeme GmbH–MF-B-400 | 30 | 32 | 156 | ~~Nonprofit O&M corp.~~ |
| Delta–Ecopod | 30 | 32 | 156 | ~~Nonprofit O&M corp.~~ |
| Delta–Whitewater | 30 | 32 | 156 | ~~Nonprofit O&M corp.~~ |
| Nayadic | 30 | 32 | 156 | ~~Nonprofit O&M corp.~~ |
| Norweco–Singulair | 30 | 32 | 156 | ~~Nonprofit O&M corp.~~ |
| Norweco–Singulair TNT | 30 | 32 | 156 | ~~Nonprofit O&M corp.~~ |
| Southern Manufacturing | 30 | 32 | 156 | ~~Nonprofit O&M corp.~~ |
| Jet Inc. | 32[d] | 31 | 163 | ~~Nonprofit O&M corp.~~ |
| ~~**Recirculating Extended Treatment Package System**~~ | | | | |
| SeptiTech | 55[e,f] | 20 | 180 mg/L | ~~Nonprofit O&M corp.~~ |
| Orenco–AdvanTex | 65[e,f] | 16 | 269 mg/L | ~~Nonprofit O&M corp.~~ |
| BioMicrobics | 65[f] | 16 | 269 mg/L | ~~Nonprofit O&M corp.~~ |

a. Quantifiable values (milligram per liter [mg/L]) will indicate compliance with the qualitative TN reduction limit expressed as a percentage (%) reduction.

b. Minimum recommended source water alkalinity to support nitrification in the denitrification process. Use of water softeners is not recommended due to potentially detrimental effects on the biological processes.
c. Literature value
d. Idaho testing
e. Third party (Environmental Technology Verification Program)
f. National Science Foundation data

# Appendix D

## 1.4.2.4 Proprietary Wastewater Treatment Product Approval Policy

Proprietary wastewater treatment products (PWTP) for subsurface sewage disposal are produced by a manufacturer to provide secondary wastewater treatment. Manufactured PWTPs must obtain an approval from DEQ prior to permitting and installation. To obtain approval the manufacturer must submit the required information listed in section 1.4 of this manual to DEQ's On-Site Wastewater Coordinator. In addition, to justify the effectiveness of wastewater treatment by the product the manufacturer must also submit the final evaluation report from NSF International on the product's evaluation under the provisions of NSF/ANSI Standard 40 or another equivalent third part standard. Equivalency of third party standards will be made by DEQ on a case-by-case basis. The NSF/ANSI Standard 40 report is required to obtain the same drainfield sizing reduction and separation distance reduction to limiting layers for the product as the intermittent sand filter or recirculating gravel filter. If the manufacturer would also like to obtain approval for total nitrogen (TN) reduction then they must also submit the final evaluation report from NSF International on the product's evaluation under the provisions of NSF/ANSI Standard 245 or another equivalent third part standard. Equivalency of third party standards will be made by DEQ on a case-by-case basis. The NSF/ANSI Standard 245 report is required to obtain the same TN reduction as the recirculating gravel filter.

Approval of PWTPs must be recommended to DEQ by the Technical Guidance Committee (TGC). Approval of a PWTP may be required to go through the same two-level approval process as extended treatment package systems (see section 1.4.2.2) depending on the system design and effluent reduction approvals sought. Approval processes and minimum installation requirements for PWTPs shall be determined on a case-by-case basis by the Technical Guidance Committee. PWTPs submitted for approval that have not been evaluated by NSF/ANSI under Standard 40 and/or 245 or another equivalent third party standard shall not be considered for reduction in drainfield disposal area or separation reductions to limiting layers. All approved PWTPs shall be installed by a permitted complex installer. Approved PWTPs are listed in section 5.14.

PWTPs may also require periodic operation and maintenance. The operation and maintenance provider for all PWTPs shall be determined on a case-by-case basis by the TGC and may be a property owner or an approved non-profit operation and maintenance entity. If a PWTP is approved, permitted, and installed with a nitrogen reduction limit that exceeds the nitrogen reduction limit of a recirculating gravel filter, then the operation and maintenance provider for the PWTP shall be a nonprofit operation and maintenance entity corporation and the system shall follow the same operation, maintenance, monitoring, and reporting requirements as extended treatment package systems. If a nitrogen reduction limit is approved for a PWTP it shall be listed in section 5.13.

**Appendix E**

## 5.14 Proprietary Wastewater Treatment Products

Revision: August 20, 2015

Table 5-15 lists proprietary wastewater treatment products approved by DEQ. Proprietary wastewater treatment products shall be installed by a permitted complex installer.

**Table 5-15. Proprietary wastewater treatment products approved by DEQ.**

| Proprietary Wastewater Treatment Product Manufacturer and Model | Treatment Limits (GPD) | Designer Requirements | Operation, Maintenance, and Monitoring Requirements | Drainfield Sizing and Size Limits | Vertical Separation Distances | Approval Date |
|---|---|---|---|---|---|---|

*Notes*: gallons per day (GPD);

# Appendix F

See Subsequent Pages

# Idaho's Guidance for the Orenco AdvanTex, Recirculating Gravel Filters, and Intermittent Sand Filters - A Comparative Analysis

By: Allen Worst

The Idaho Technical Guidance Committee has elected to categorize three nearly identical residential wastewater secondary treatment systems in two, very different ways. This oversight has resulted in the application of two of these technologies, not based on their ability to protect the waters of the State of Idaho, but based on homeowners allowance to avoid the hassle and cost of ongoing maintenance required of one system using nearly the identical treatment technology. I will simply list the facts and the author's observations relating to each of these three systems below, then follow with a few recommendations for resolution of this oversight by the Technical Guidance Committee.

Intermittent Sand Filter (ISF): *Idaho Technical Guidance Manual...Section 4.23, Page 4-113*

1. **Technology Description:** Biological, attached growth filter technology using non-submerged media (sand) to house and separate a microorganism colony. The sand is dosed with septic tank effluent at regular intervals using a pump and regulated by a control system timer mechanism. Once having percolated through the sand one time, the wastewater is then collected and discharged to a subsurface disposal system.
   **Author's Observations/Opinions:** Due to increased nitrogen reduction effectiveness, and the smaller footprint requirement of Recirculating Gravel Filters (RGF), ISF technology is not the top choice of designers, home owners, or installers when treatment is required.
2. **Design:** Each residential ISF must be designed by a professional engineer licensed in the State of Idaho. Limited guidance exists in the TGM under section 4.23.3.
   **Author's Observations/Opinions:** Wide variability in ISF designs have been observed. Some being excellent, but most have been difficult to install and operate without substantial modification during or after installation. Many engineers who take these on have little experience in wastewater treatment design due to the lack of on-site wastewater system design training in Idaho.
3. **Construction:** Assembly and complete construction is performed by an Idaho licensed Complex Installer.
   **Author's Observations/Opinions:** Extreme variability at this phase exists regularly. Most Idaho Complex Installers have no specific training in ISF construction due to the lack of State training requirement. Most do not understand how and why the critical components are assembled and how they work to insure a functional filter. The consistency of the sand selected for the media bed is critical. Fines in the sand product can lead to filter plugging, overflowing or short circuiting which provides little to no treatment. Poorly manufactured concrete tanks, and degradable construction materials can lead to septic effluent seeping directly into the soil.

4. **Operation and Maintenance (O & M):** An O&M manual must be submitted as part of the permit requirement and described in the TGM Section 4.23.6, and ongoing maintenance is suggested, but not required. No enforcement or accountability criteria is set forth to insure maintenance is performed.
   **Author's Observations/Opinions:** If left up to the homeowner, these systems will most likely never see the periodic maintenance and oversight needed. Also, because sampling is not required and never performed, the design, construction and operation integrity can never be confirmed. These system often fall into a state of disrepair and provide little or no treatment after a short period in operation.
5. **Long Term Performance:** No maintenance, inspections, or testing is required. No testing data is available for Idaho systems, therefore we don't know how well these systems are performing. ISF technology has proven to be effective at meeting carbonaceous biochemical oxygen demand (cBOD) and total suspended solids (TSS) reduction rates of around 80-90% in other states. Total Nitrogen reduction rates have proven to be less than 30% and averaging around 20% due to single pass effluent dosing. These reduction rates only stand as long as the systems are operating at peak efficiency. Lacking maintenance, peak efficiency would be difficult if not impossible to maintain long term.
   **Author's Observations/Opinions:** Industry professionals would agree, that if left to operate without some schedule of maintenance, the long term viability for ISF technology is poor at best.
6. **Upfront and Long Term Cost:** Cost for construction is comparable to the other two technologies depending on installer and engineer. Engineering adds some cost when compared to the Orenco AdvanTex (AX) system below.
   **Author's Observations/Opinions:** Sand filters have the perception that they are low maintenance and therefore low cost, and this might be true to a point. Once failed, the cost to replace the sand media is substantial due to lack of access and volume of sand required.

Recirculating Gravel Filters (RGF): *Idaho Technical Guidance Manual...Section 4.22, Page 4-102*

1. **Technology Description:** Biological, attached growth filter technology using non-submerged media (gravel) to house and separate a microorganism colony. The gravel is dosed with untreated and/or diluted septic tank effluent at regular intervals. The distribution of effluent is regulated using a pump control timer mechanism. Once having percolated through the gravel, the filtrate is either returned back to the filter pumping tank to be diluted with incoming effluent and previously recirculated filtrate, or the treated wastewater is collected and discharged to a subsurface disposal system.
   **Author's Observations/Opinions:** RGFs are the most commonly installed sand/gravel filter technology.
2. **Design:** Each residential ISF must be designed by a professional engineer licensed in the State of Idaho. Limited guidance exists in the TGM under section 4.23.3.

**Author's Observations/Opinions:** Identical issues as ISFs. See ISF observations above.

3. **Construction:** Assembly and complete construction is performed by an Idaho licensed Complex Installer.
   **Author's Observations/Opinions:** Identical issues as ISFs. See ISF observations above.
4. **Operation and Maintenance:** An O&M manual must be submitted as part of the permit requirement and described in the TGM Section 4.23.6. Ongoing maintenance is suggested, but not required. No enforcement or accountability criteria is set forth to insure maintenance is performed.
   **Author's Observations/Opinions:** Identical issues as ISFs. See ISF observations above.
5. **Long Term Performance:** No maintenance, inspections, or testing is required, and therefore testing data is not available for Idaho systems. It is unknown how well these systems have performed since first approved in Idaho. RGF technology has proven to be effective at meeting cBOD and TSS reduction rates of around 80-90%. Total Nitrogen reduction rates are usually average approximately 50% if properly configured with a split flow return diverting a portion of the nitrified effluent back to the head end of the septic tank. These reduction rates only stand as long as the systems are operating at peak efficiency. Lacking maintenance, peak efficiency would be difficult to maintain long term.
   **Author's Observations/Opinions:** Once again, industry professionals will agree, that if left to operate without some schedule of maintenance, the long term viability for ISF technology is poor at best.
6. **Upfront and Long Term Cost:** Cost for construction is comparable to the other two technologies depending on installer and engineer. Engineering adds some cost when compared to the Orenco AdvanTex system below.
   **Author's Observations/Opinions:** Recirculating gravel filters have the perception that they are low maintenance and therefore low cost, and this might be true to a point. Once failed, the cost to replace the gravel media is substantial due to lack of access and volume of gravel required.

Orenco Systems, Inc. AdvanTex Packaged Treatment System (AX): *Idaho Technical Guidance Manual...Section 4.10, Specific product listing found in Section 5.4.*

7. **Technology Description:** Biological, attached growth filter technology using non-submerged media (textile) to house and separate a microorganism colony. The textile is dosed with untreated and/or diluted septic tank effluent at regular intervals. The distribution of effluent is regulated using a pump control timer mechanism. Once having percolated through the media, the filtrate is either returned back to the recirculation pumping tank to be diluted with incoming effluent and previously recirculated filtrate, or the wastewater is collected and discharged to a subsurface disposal system. NOTE: THIS PROCESS IS IDENTICAL TO THE RGF AND VERY SIMILAR TO THE ISF. THE FUNCTION AND OPERATION & MAINTENANCE

REQUIREMENTS. One primary difference that has proven to be invaluable to the reliable operation of the AdvanTex system is the remote reporting alarm and function monitoring system built into the control panel provided on each AdvanTex system. This panel reports problems directly to the O&M provider in nearly real-time.
**Author's Observations/Opinions:** RGF, ISF and the AdvanTex system all use the same basic process for treating wastewater. The operation and maintenance needed are nearly identical.

8. **Design:** The AX is a derivative of RGF technology, but with a couple differences in design, construction and assembly. The AX system is evolving, but the core system design is established by the product manufacturer. Once complete, the design is put into production and multiple products are built based on the one design. The AX system is considered to be pre-designed by the manufacturer and does not require engineering under Idaho guidance. The AX system treatment media is a proprietary textile which provides exponentially more treatment surface area per volume when compared to sand or gravel. As a result, the size of AX media filter can be reduced dramatically. The size reduction allows the manufacturer to build each complete system in a quality controlled factory environment whereby improving product consistency. Each system is delivered to the job-site in package form, whereby reducing field assembly errors.
**Author's Observations/Opinions:** Idaho requires no system specific engineer training on basic or complex system design and installation. The AdvanTex system removes the potential of poor or inexperienced design development.
9. **Construction:** Assembly and complete construction is performed by a factory technician who is skilled in the assembly of the AX system. Once delivered to the job-site, an Idaho licensed Complex Installer performs the simple task of setting the unit into the ground, connecting piping and backfilling. Often, an Idaho licensed electrician performs the electrical connections. A complete start-up document is required before the permit is finaled.
**Author's Observations/Opinions:** When built in a factory vs. field assembled, the product quality is improved. A large percentage of basic and complex system failures are attributed to improper system installation. Idaho requires no system specific training on basic or complex system design and installation, but Idaho Guidance governing this technology requires product specific factory installation training. Because it is delivered complete and assembled, the installation process is simplified whereby improving the likelihood of a successful installation.
10. **Operation and Maintenance:** O&M is required to include yearly inspections, testing and maintenance under Idaho's Extended Treatment Packaged System (ETPS) program. See Section 4.10 of the TGM for details.
**Author's Observations/Opinions:** These system are inspected, maintained, and effluent samples are tested annually for the life of the system under the ETPS program.
11. **Long Term Performance:** AdvanTex systems have been in operation in Idaho since 2003. Currently, more than 140 systems are in operation. Each system has been

maintained and tested per the ETPS program and an average of ALL the results are as follows:

a. BOD*/cBOD (Carbonaceous Biological Oxygen Demand) - 8 mg/L (average of 807 samples) (40 mg/L or less is considered passing under Idaho's ETPS Program) **Early in the program, testing for BOD was required. Later this requirement was changed to cBOD. Wastewater tested for BOD includes the cBOD (carbonaceous oxygen demand) component, but also the nitrogen oxygen demand component which results in a higher number when compared to cBOD alone.*
b. TSS (Total Suspended Solids) - 6.9 mg/L (average of 813 samples) (45 mg/L or less is considered passing under Idaho's ETPS Program)
c. TN (Total Nitrogen) - 19.65* mg/L (average of 98 samples) (The performance threshold varies due to permit conditions) **Some of the systems sampled are not configured for optimal nitrogen reduction.*

**Author's Observations/Opinions:** With inspections and maintenance, the Orenco AdvanTex treatment system has proven to perform reliably under the ETPS program. It has been observed that these systems would not have functioned without additional oversight of the system, or additional oversight of the system's operating conditions and use. After the first 2 years, most systems that had not documented issues, operate reliably in subsequent years. With remote monitoring installed and functional, the AdvanTex system could easily extend the maintenance frequency to once every 3-5 years after a yearly inspections during the first two years.

12. **Upfront and Long Term Cost:** Cost for construction is comparable to the other two technologies and in some cases, less expensive. The added cost in engineering is not applicable.

    **Author's Observations/Opinions:** The long term cost of the AdvanTex system is higher due to the required maintenance. This is the very maintenance that insures reliable system operation. Both the sand and gravel filters lack this maintenance requirement, and therefore many homeowners are opting for the perceived low cost solution.

**Summary of Issues Presented Above:**

Although often poorly designed and constructed, performance accountability does not exist for ISF and RGF technologies under the TGM. These systems can go for years in a failed condition although permitted in conditions of close proximity to ground and surface water.

AX systems are nearly functionally identical to the ISF and RGF systems, but are actually designed, constructed, installed and operated under a much higher level of accountability under the ETPS program. AX systems have demonstrated their reliability in Idaho during the years this technology has been in use. Often the ISF and RGF technologies are considered

for new construction due to the lack of O&M requirements placed on them, not their ability to protect public health.

**Proposed Solutions for Consideration:**

1. On the grounds that the Orenco AdvanTex is functionally identical to the RGF and similar in function to the ISF, move it out of the ETPS program and classify this technology with the ISF and RGF filters in the TGM where the same maintenance requirements, or lack thereof, would apply.
2. Move the ISF and RGF into the ETPS program whereby establishing the ongoing operation and maintenance program needed for these complex technologies.
3. Classify AX, RGF and ISF treatment technologies as packed bed filters in the TGM. Because of the filtration barrier present in these systems, and proven reliability, alter the maintenance requirement for these technologies under the ETPS program to include yearly inspections and sampling for the first two years, and then once every 2-3 years thereafter as long as a track record of reliability has been demonstrated.

Alternative Wastewater LLC
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**Request to the TGC,**

In recent months we have proposed changes to how we classify our different onsite treatment technologies. The ISF and RGF have always been separate from the ETPS program because they do not continue to discharge when they malfunction or fail. Committee members and the state have expressed support for allowing other "non-passive" onsite treatment systems to move into the same category as the ISF and RGF. I propose that the committee evaluates the Biobarrier mbr by Bio-microbics, which is currently a Nitrogen reducing ETPS, and remove the O&M requirements based on its many NSF approvals(40,245,350,fecal coliform) and non-passive mechanical treatment design.

**System design overview,**

Biobarrier is a membrane bioreactor(mbr) system that uses biological treatment in conjuction with a laminate style membrane for filtration of wastewater. The membrane sheets are PVdF and PES cast material laser welded to a HDPE endoskeleton and arranged into a cartridge with a common trunk line for permeate. The cartridge is housed in a protective HDPE shell and mounted ontop an airgrid and placed at the bottom of a sealed tank separate from the settling tank. Fresh air is pumped through the air grid via above ground blower which provides scouring to membrane sheets as well as dissolved O2 for aerobic treatment. Treated wastewater is filtered through the membrane material(nominal pore size of 0.02-1.4) and transferred out of the treatment tank by pump.

**Treatment process,**

Membrane bioreactors are a suspended growth type system. The membrane pore size keeps 100% of the microorganisms in suspension in the mixed liquor where they are aerated and mixed with untreated effluent from the settling zone. This creates an aggressive biology in a small footprint that has been proven effective for removal of; Nitrogen, Phosphorous, coliforms, hormones, pharmaceuticals. In mbr's where N removal is the primary concern, the treatment tank is split into two connected compartments. The first compartment is the anoxic zone responsible for denitrification, the second is the oxic where the membrane is located. Large organic N's and Ammonia are first broken down into Nitrate and Nitrite where the DO is high, then further converted to N gas in the anoxic zone where DO is low. This aerobic treatment paired

with the membrane's filtering capabilities gives us an exceptional effluent that is safe for our environment.

**System failure process,**

Every component of the biobarrier system is vital and must be working properly for the system to filter. If any electrical piece malfunctions or is disabled the membrane will instantly foul and water will back up until repairs are made. If a membrane is damaged the permeate pump will instantly fail causing back up, and if routine thinning of the mixed liquor is missed the membrane will foul resulting in high water alarms.

**Long term maintenance and initial cost,**

A biobarrier's major components are: membrane cartridge, blower, permeate pump, control panel. The two items with the shortest life span are the blower and permeate pump, which is approximately 5-8 years. The only necessary maintenance aside from replacing broken equipment is the mixed liquor must be kept <1200-TSS. This typically means wasting liquor once every 12-18 months, but it depends on the size of the treatment tank and the usage of the system.

Costs to construct a 500gpd biobarrier are on par with other available treatment packages. For a basic BB a customer will need a septic tank, treatment tank and the Bb. Average costs for an installed Bb are 5-6,000.00 which added to the rest of the system by an excavator would usually be well below 15,000 overall.

Thank you for your consideration,
Ryan Spiers, general manager AWS