



State of Delaware
Department of Natural Resources & Environmental Control
Division of Water Resources
Ground Water Discharges Section

Innovative and Alternative System Approval

ISSUED TO: Bio-Microbics Incorporated
8450 Cole Parkway
Shawnee, KS 66227

Phone (913) 422-0707
Fax (913) 422-0808

FROM: Hilary Moore – Environmental Engineer
Ground Water Discharges Section

FOR: RetroFAST 0.375

APPROVAL DATE: May 16, 2006

In accordance with the Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems (Regulations), an application dated April 27, 2006, has been submitted by Bio-Microbics, for approval of the RetroFAST advanced treatment unit as an Innovative & Alternative On-Site Wastewater Treatment Unit.

Based on the review of the application, the Department hereby grants approval of the use of the RetroFAST advanced treatment unit as an Innovative & Alternative On-Site Wastewater Treatment Unit subject to the conditions, limitations, and requirements set forth herein:

1. Product Description

The RetroFAST system is a submerged attached-growth system which is inserted as a retrofit device into the outlet side of a new or existing septic tank. The RetroFAST has a rated capacity of 375 gallons per day. The only mechanical

component is a remotely housed air blower, which provides the air for oxygen supply and mixing to the aerated chamber. A control panel is utilized to activate if blower fails.

The FAST process is a two zone design which consists of a primary anaerobic settling zone and an aerobic biological treatment zone. Solids are trapped in the primary settling zone. The aerobic biological zone consists of a submerged media bed which is colonized by nitrifying bacteria naturally present in sewage. Wastewater is then recirculated between the two zones allowing nitrification and denitrification to occur. The RetroFAST unit is purchased as a module that is fitted into a DNREC approved septic tank. A remote-mounted, above ground blower is the systems only moving part which runs on a continuous basis unless otherwise set by the manufacturer. This introduces air into the system and facilitates the circulation of wastewater through the media's channeled flow path.

2. Claim

Approval is based on information submitted by the Manufacturer indicating the specified model will routinely provide effluent quality not exceeding 30 mg/l of BOD₅, 30 mg/l of TSS, and 20 mg/l of Total Nitrogen (TN) assuming influent loading does not exceed the treatment capabilities of the units.

This unit has completed the Environmental Technology Verification Testing.

3. Use and Design Criteria

- a. The RetroFAST unit may be installed for new and replacement systems with conventional and innovative and alternative disposal systems.
- b. The RetroFAST unit may only be installed in DNREC approved septic tanks. The septic tank must be at a minimum 1,000 gallons.
- c. The RetroFAST 0.375 unit may only be used to accommodate flows from a three bedroom dwelling (360 gpd), unless otherwise specified. See manufacturer's recommendations for sizing.
- d. An on-site wastewater treatment and disposal system permit application incorporating a RetroFAST unit shall be designed in accordance with the Regulations, and manufacturer's specifications. The design shall be completed by a DNREC Class C Design Engineer unless otherwise approved by the Department. The permit application shall include proper unit specifications.
- e. The designer must assure that the settling zone and treatment zone have above grade access. The media shall also have

above grade access. The design also must ensure that the control panel and blower are accessible.

- f. The RetroFAST unit shall not be installed within areas subject to traffic loads unless specially designed on a case by case basis in accordance with the Regulations.
- g. The manufacturer is responsible for providing the Department a list of all local distributors and their associated contact information. This list must be kept current and shall be submitted to the Department on a yearly basis.

4. Installation Procedures

- a. The RetroFAST unit shall be installed by a DNREC Class E System Contractor under the supervision of a manufacturer's representative, or by a DNREC Class E System Contractor who has been certified for unit installation. Proof of certification shall be provided in writing to the Department.
- b. The blower must be installed on a concrete base and located no more than 100 feet from the septic tank.
- c. Start up of the system and initial operational checks shall be conducted by the Class E System Contractor (trained by the manufacturer), Design Engineer, and a Ground Water Discharges Section (Large System Branch) representative. If the Class E System Contractor is not certified, a manufacturer's representative shall perform the operational checks of the system at start up. If the manufacturer's representative can not be on site at the time of start up, they must provide final start up approval to the Department in writing.

5. Operation and Maintenance

- a. The RetroFAST shall be operated and maintained in accordance with the manufacturer's specifications.
- b. The manufacturer or manufacturer's representative shall comply with all Department mandated requirements as specified in permit conditions. This shall include operation and maintenance requirements.

6. Sampling and Approval

The Department reserves the right to sample any unit at any time.

7. General Conditions

- a. Use of the system for wastes other than residential shall be on a case by case.

- b. In the event that the product fails to perform as claimed by the applicant, and it is found that the system is installed and working as designed, and there is not toxicity in the waste; the use of the units for new installations shall cease. Use of the units shall not resume until such time the applicant and the Department have reached an acceptable agreement for resolving the situations.
- c. Any changes that deviate from the specifications as submitted with this approval shall be approved by the Department prior to use.