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
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FROM: Hilary Moore – Environmental Engineer
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FOR: MicroFAST 0.5, 0.75, 0.9, 1.5, 3.0, 4.5, 9.0
HighStrengthFAST 1.0, 1.5, 3.0, 4.5, and 9.0

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 MicroFAST and HighStrengthFAST advanced treatment units as an Innovative & Alternative On-Site Wastewater Treatment Units.

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

1. Product Description

The MicroFAST and HighStrengthFAST units utilize a fixed activated sludge treatment process to treat and denitrify wastewater. 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 FAST 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. The system also contains a visual/audible alarm.

The various models have the treatment capacities shown in the following table:

Model	Capacity (gallons per day - gpd)
MicroFAST 0.5	500
MicroFAST 0.75	750
MicroFAST 0.9	900
MicroFAST 1.5	1500
MicroFAST 3.0	3000
MicroFAST 4.5	4500
MicroFAST 9.0	9000

***For HighStrength FAST units consult factory for treatment capacities.**

2. Claim

Approval is based on information submitted by the Manufacturer indicating the specified models will routinely provide effluent quality not exceeding 30 mg/l of BOD_5, 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 been NSF 40 certified.

3. Use and Design Criteria

a. The Bio-Microbics FAST units may be installed for new and replacement systems with conventional and innovative and/or alternative disposal systems.
b. An on-site wastewater treatment and disposal system permit application incorporating a Bio-Microbics FAST 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.

c. The designer must assure that the settling zone and treatment zone must have above grade access. The media bed shall also have above grade access. The design also must ensure that the control panel and blower are accessible.
d. The Bio-Microbics FAST units shall not be installed within areas subject to traffic loads unless specially designed on a case by case basis in accordance with the Regulations.
e. 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 Bio-Microbics FAST 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 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 Bio-Microbics unit shall be operated and maintained in accordance with the manufacturer's specifications. In accordance with the NSF approval, the manufacturer is responsible for maintaining this certification.
b. The manufacturer or manufacturer's representative shall comply will 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 basis.
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 no 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.