



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

## **Innovative and Alternative System Approval**

**ISSUED TO:** KEE Process, Ltd.  
College Road, Aston Clinton  
Buckinghamshire, United Kingdom HP225EZ

C/O WasteWater Solutions International  
3238 Old Fence Road  
Ellicott City, MD 21042

**FROM:** Hilary Moore – Environmental Engineer  
Ground Water Discharges Section

**FOR:** KEE Process Managed Flow NuDisc RBC Model BB

**APPROVAL DATE: October 11, 2006**

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In accordance with the Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems (Regulations), an application dated September 13, 2006, has been submitted by WasteWater Solutions International on behalf of KEE Process, for approval of the KEE Process Managed Flow NuDisc RBC BB advanced treatment unit.

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

### **1. Product Description**

The KEE Flow NuDisc BB is a rotating biological contactor (rbc) that is comprised of three main components: (1) the primary settling and sludge storage

area, (2) the rotating biological contactor discs and drive, and (3) the final settling and sludge storage area. The raw sewage enters the primary settlement zone of the unit by gravity flow. As the flow enters, the solids are deposited in the lower part of the primary settling zone. The settled or partially clarified wastewater then passes into the first compartment of the biologically active zone. The primary sludge is held in the primary zone, to be drawn off by a licensed waste hauler in accordance with manufacturer's guidelines.

The biologically active zone accepts the flow from the primary settling tank. This zone is divided by rotating baffles on the rotor sandwiched in the media packs. The banks of discs which are fixed to a central shaft rotate in the compartments so that approximately 35 % of disc area is submerged in the liquor. The rotor is drive by an electric motor in which the rotation speed of the discs is fixed. An aerobic biologically active film or biomass builds up on the surface of the discs, treating the wastewater. The biomass that sloughs off in the first bank can enter the primary settling tank through slots in the base of the compartments. Biomass sloughing from the discs in the other biozone compartments is kept in suspension by turbulence created b the discs and passes into the final settling zone where it settles out and is removed during the desludging operation.

The treated effluent is discharges by gravity.

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

Model	Capacity (gallons per day - gpd)
KEE NuDisc RBC Model BB	600

## 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<sub>5</sub>, 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 KEE NuDisc BB unit may be installed for new and replacement systems with conventional and/or innovative and alternative disposal systems.
- b. An on-site wastewater treatment and disposal system permit application incorporating a KEE NuDisc BB 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 cover of the KEE NuDisc BB is located above grade so that the unit can be easily accessible. The design also must ensure that the control panel so that it is positioned adjacent to the unit so that (1) it does not interfere with the cover removal, (2) it cannot be reached by someone standing in or on the unit, and (3) close enough to enable the electrical connections to be made in the unit.
- d. The KEE NuDisc BB 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.
- e. The Design Engineer must ensure anti buoyancy of the unit.
- f. 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 Kee NuDisc BB 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. 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 KEE NuDisc BB 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 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 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 unit 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.