



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

**Innovative and Alternative System Approval**

**ISSUED TO:** Norweco Equipment Company  
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**FROM:** Hilary Moore – Environmental Engineer  
Ground Water Discharges Section

**FOR:** Singlair Model 960 Advanced Treatment Unit

**APPROVAL DATE:** March 3, 2005  
**AMENDED DATE:** May 30, 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 February 15, 2005 has been submitted by Norweco Equipment Company, for approval of the Singlair Model 960 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 Singlair Model 960 Advanced Treatment Unit as an Innovative & Alternative On-Site Wastewater Treatment Unit. The following conditions, limitations, and requirements must be adhered to:

**1. Product Description**

The Singulair Advanced Treatment Unit utilizes a patented extended aeration, activated sludge and filtration process. This flow equalized, flow through process commences with a pretreatment chamber, followed by an aeration chamber provided with an infused air system operating on a timed run cycle. The typical run time is 30 minutes per hour. Settling is accomplished in a clarification chamber following the aeration chamber. A Bio-Kinetic system is located in the clarification chamber which provides flow equalization, final filtration, settling and optional chlorination/dechlorination.

**Singulair Model 960 Data Chart**

<b>Model 960</b>	<b>500 gpd</b>	<b>750 gpd</b>	<b>1000 gpd</b>	<b>1250 gpd</b>	<b>1500 gpd</b>
<b>Daily Treatment Capacity (gpd)</b>	500	750	1000	1250	1500
<b>Total System Capacity (gallons)</b>	1300	1600	2300	2850	3400
<b>Number of Singulair Aerators</b>	1	1	2	2	2
<b>Number of Bio-Kinetic Systems</b>	1	2	2	3	3
<b>Number of Bio-Static Sludge Returns</b>	1	1	1	2	2

**2. Claim**

**Approval is based on information submitted by the Manufacturer indicating the specified model will routinely provide effluent quality not exceeding 10 mg/l of BOD<sub>5</sub>, and 10 mg/l of TSS.**

**This unit has been certified as NSF Standard 40, Class I, which meets secondary effluent characteristics.**

**3. Use and Design Criteria**

- a. The Singulair advanced treatment unit may be installed for new and replacement systems with conventional and innovative and alternative disposal systems.

- b. The Singulair advanced treatment unit shall be utilized for residential applications up to 1500 gallons per day. Additional flows will require manufacturer's guidance.
- c. An on-site wastewater treatment and disposal system permit application incorporating a Singulair advanced treatment 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.
- d. The designer must assure that the pretreatment chamber, extended aeration chamber, and the final clarification chamber all have above grade access. The design also must ensure that the control panel and blower are accessible.
- e. The Singulair advanced treatment 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 and in accordance with manufacturer's specifications.
- 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 Singulair advanced treatment 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 Singulair advanced treatment unit shall be operated and maintained in accordance with the manufacturer's specifications.
- b. The manufacturer 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, 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.