Pennsylvania Department of Environmental Protection
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101
August 25, 2009

Bureau of Water Standards
and Facility Regulation

717-787-8184

To All Sewage Enforcement Officers:

The purpose of this letter is to inform you of an Alternate System classification for the Orenco Inc. Advantex AX-Series Treatment System.

Orenco AdvanTex® AX-Series Treatment System

Orenco AdvanTex (AdvanTex): Orenco Systems, Inc. is the first company to complete DEP's Technical Verification Program (TVP) that allows for consideration for classification as an appropriate alternate onlot wastewater technology. Please note that classification as an alternate sewage system indicates the system or component has been documented as a method of demonstrated onlot sewage treatment and disposal but is not (yet) recognized in a regulation. AdvanTex underwent performance verification at a test center qualified by NSF followed by field verification testing at 11 sites in Pennsylvania. Based on test center and field verification data, DEP has determined that classification for an alternate system is appropriate for total nitrogen reduction in accordance with Chapter 73.72(c)(7)(iii) and for enhanced treatment capacity for BOD and TSS.

The attached listing provides the technology description, design requirements, minimum maintenance standards, and planning and permitting requirements. Information on the AdvanTex is available on the company website (www.orenco.com) or through the following Orenco distributors.

- Atlantic Solutions, LTD, 1210 Dixona Drive, Edgewater, MD 21037, Phone (877) 214-9283
- The Wells Team, Inc., 4 Baldwin Drive, Lancaster PA 17602, Phone (717) 203-6049

Please note that in order to issue a permit for the AdvanTex AX-Treatment System, training is required. Orenco should be contacted for a training schedule.

If you have any questions regarding this information please contact us at the telephone number listed above.

Sincerely,

John Diehl, P.G.

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Chief, Act 537 Management Section
Division of Planning and Permits

Enclosure

Commonwealth of Pennsylvania
Department of Environmental Protection (DEP)
Bureau of Water Standards and Facility Regulation
Harrisburg, PA

Issued to: Sam Carter, Government Relations Manager
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Phone: 800-348-9843
www.orenco.com

Technology: Orenco AdvanTex® AX-Series Treatment System

Classification Date: August 25, 2009, October 6, 2009

Classification Type: Alternate technology

In accordance with Title 25, Chapter 73, Section 73.72, DEP classifies the Orenco AdvanTex® AX-Series (AdvanTex) treatment system for use as an alternate onlot sewage treatment system. This classification permits the use of the AdvanTex as a treatment system used for the specific purposes of reducing BOD_5, TSS, and total nitrogen in the sewage effluent prior to discharge to an absorption area. This system has demonstrated that it can produce an effluent equal to or better than 10 mg/L BOD_5/$CBOD_5$ and 10 mg/L TSS as monthly averages. With ultraviolet disinfection, the AdvanTex can also reduce fecal coliform concentrations to less than 200 cfu/100 ml on a monthly average basis. When the system is used to reduce total nitrogen, the discharge limitations for total nitrogen should be less than 20 mg/l as a monthly average. The system is approved for use on limiting zones of less than 20 inches. The AdvanTex also satisfies NSF Std-40 criteria and may be used as a conventional aerobic treatment tank described in Section 73.32 where nitrogen removal is not a concern.

I. Technology Description

The AdvanTex treatment system configuration consists of either a single dual-compartment processing tank or a combination of separate septic and recirculating tanks with each configuration followed by wastewater recirculating through AdvanTex packed bed filters, and a final discharge of the effluent to an onlot absorption area or spray field.

II. Design Requirements

a. Location: The AdvanTex may be installed for the treatment of domestic strength wastewater serving a new construction, a replacement, or as a repair.
b. Size: All Orenco AdvanTex AX-Series Treatment Systems may be used.
c. Construction:
    (1) The AdvanTex must be installed:
        i. Per the manufacture's installation instructions.
        ii. By an Orenco trained and authorized installer.

(2) Tank installations must consist of either a two-compartment tank, two tanks in series, or otherwise conform to meet the requirements of Section 73.31. Vertically aligned circular tanks are not permitted.
(3) The number of AdvanTex AX-Series filters to be installed must be in accordance with the manufacturer's design specifications.
(4) The AdvanTex sewage system must be constructed so that a sample can be collected from the recirculating splitter valve in accordance with the operation and maintenance manual at the location shown in Figure 1.
(5) The AdvanTex must be configured and operated using the Combination Mode.
(6) The AdvanTex filters must maintain between a minimum recirculation ratio of 4:1 and a maximum recirculation ratio of 7:1 based upon actual daily flow. The preferable recirculation ratio is 4:1.
(7) All valves connected to the manifold inside the AdvanTex filter must be in the closed position during operation.

d. Use of the Component/System and Siting Requirements:
(1) Refer to Part 3.B.2 and 3.B.3 of the Alternate Systems Guidance (Document ID 362-0300-007).
(2) General:
i. Where absorption area sizing reductions are proposed, they are not cumulative. No additional sizing reduction is allowed for use of either an aerobic tank or infiltration chambers.
ii. If absorption area sizing reductions are proposed, where the system is used to serve a new dwelling, the soil profile evaluations and percolation testing must document that sufficient area is available for installation of a full-sized absorption area (prior to the calculation of the 40 percent reduction).
iii. The absorption area must be designed to take full advantage of the slope to move effluent out from under the absorption area and downgradient with the laterals placed parallel to the contour.

III. Minimum Maintenance Standards

a. Service Contract: A service contract with a Service Provider qualified to maintain the AdvanTex Treatment System is required. The telemetry monitoring system is optional for the AX-20 but required for the AX-100.
b. Inspection:
(1) Inspection of the area around the outside of the media filter and soil absorption area every 6 months by the homeowner and annually by the Service Provider to ensure that there is no ponding of effluent or downgradient seepage.
(2) Septic tanks, dosing tanks, and lift pump tanks shall be inspected every 6 months for structural integrity of the tank, inlet and outlet baffles, solids retainer, pumps, siphons, and electrical connections. Aerobic tanks shall be inspected every 6 months for structural integrity of the tank, inlets, and outlet baffles, buoyed solids retainer, pumps, siphons, and electrical connections. The inspection and concurrent pumping of excess solids shall be conducted in accordance with the manufacturer's requirements. In system configurations where spray irrigation is proposed as the final

treatment and disposal option, operation and maintenance shall comply with the applicable provisions of Chapter 73, Section 73.167 (Operation and Maintenance) and specifically Chapter 72, Section 72.25(h).

c. Ultraviolet Disinfection Equipment:
   (1) Disinfection units shall be inspected monthly by the property owner and every 6 months by the maintenance entity established under Chapter 72, Section 72.25(h). The disinfection unit must be clean and be functioning within the specifications of the manufacturer. A qualified technician must determine if the unit meets or exceeds the published minimum standard as described in Part 3.B.3.c.(2)(h) of the Alternate Systems Guidance. Additionally, the UV tube must be replaced if it is found to be necessary during the inspection or at least annually.
   (2) Availability of a spare UV tube and other necessary equipment to allow prompt repair of the ultraviolet unit by qualified personnel instructed in the operation and maintenance of the equipment.
d. Sampling:
   (1) When the AdvanTex is installed for the purposes of reducing total nitrogen (TN), a sample should be collected from the treated effluent at least once annually by the maintenance provider and analyzed for TN. The location of sampling should be in accordance with the operation and maintenance manual as shown in Figure 1. Analysis should be completed by a certified laboratory. A test result for TN that is 45 mg/l or greater may indicate system non-compliance and possible performance issues. Such results justify further investigation to determine a cause for the observed condition and to determine possible repair activity. Continued non-compliance is considered a nuisance violation under Section 14 of the Act and may be subject to compliance action by the local agency.
   (2) The Service Provider may require additional sampling if in the Service Provider's judgment the AdvanTex can be adjusted to keep the effluent below the following: 10 mg/L BOD_5/$CBOD_5$, 10 mg/L TSS, 200 cfu/100 ml fecal coliform, and/or 20 mg/L total nitrogen.
   (3) Test results must be sent to the local agency and DEP Central Office (Division of Planning and Permits) annually.
   (4) The homeowner must retain annual records of monitoring information on a rolling 5-year period.

IV. Permitting Requirements

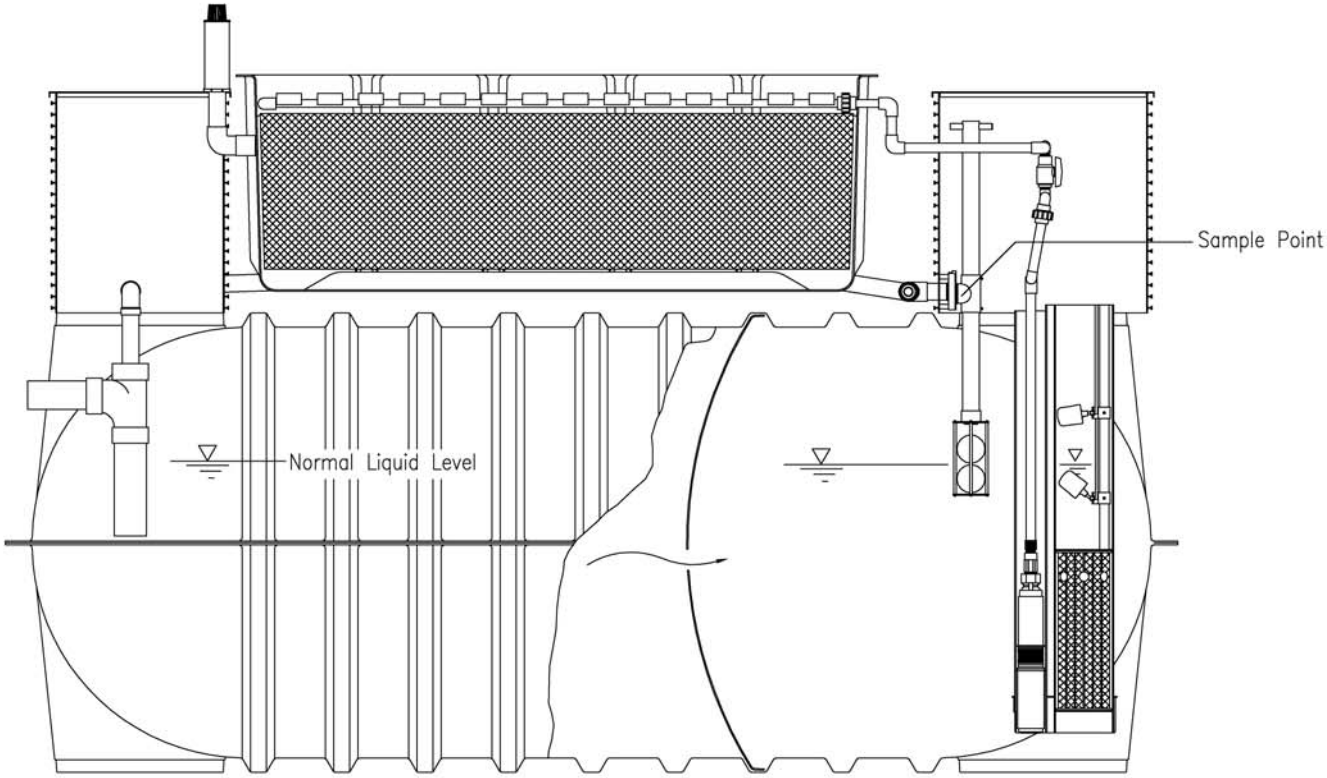
a. A sewage enforcement officer who has successfully completed an appropriate Department sponsored training course that included this specific technology or has received review delegation in writing from the Department may independently review the design and issue the permit for components under this listing. All other proposals under this listing must be submitted to the Department for review and comment.
b. When permitting onlot systems in areas of elevated nitrate-nitrogen groundwater concentrations, the permitting authority must verify whether a DEP sewage facilities

planning approval letter condition exists which requires the lot(s) to be permitted with the the AdvanTex treatment system.

c. Issuing onlot sewage system permits that are inconsistent with planning approval conditioned upon use of the AdvanTex treatment system is considered a violation of Act 537.
d. Section III.a and III.d are required to maintain operation of the AdvanTex treatment system.

V. Planning Requirements
   a. The AdvanTex treatment system satisfies the nitrate-nitrogen reduction requirement conditions specified in certain DEP sewage facilities planning module approval letters.
   b. A preliminary hydrogeologic evaluation is required under conditions set forth in 71.62(c)(2). Results from the preliminary hydrogeologic which identify a potential for a conflict between the proposal and existing or potential future uses of groundwater in the area will require a detailed hydrogeologic study. The accepted nitrogen loading figure that may be used for assessing groundwater impacts from the AdvanTex treatment system may be lowered to 20 mg/l total nitrogen in the preliminary hydrogeologic evaluation when a commitment to use the AdvanTex is included with the planning proposal. Note that the DEP Bureau of Laboratories defines total nitrogen as TN = NO_2-N + NO_3-N + TKN-N. Preliminary hydrogeologic evaluations may assume that all nitrogen entering the system will be converted to nitrate-nitrogen as stated in *Impact of the Use of Subsurface Disposal Systems on Groundwater Nitrate Nitrogen Levels* (Document ID 362-2207-004). Thus, the 20 mg/l total nitrogen shall be considered equivalent to 20 mg/l nitrate-nitrogen.
   c. DEP may require the permitting and use of the proposed AdvanTex technology as a condition for approval of that project.

Figure 1: Sample Point
AdvanTex® Treatment System - AX20



Side View