CASE STUDY

A Sustainable Wastewater Solution for Residential Properties

LA PINE, OREGON

Problem High-density septic systems in and around Bend, Oregon, were contributing to nitrate pollution of the aquifer. With the population projected to increase dramatically over the next several years, nitrate levels were expected to rise even further. But development was too scattered for the installation of a centralized sewer system.

Solution The Environmental Protection Agency (EPA) funded a demonstration project in La Pine, Oregon (30 miles south of Bend), with the goal of jumpstarting the use of innovative, decentralized wastewater treatment systems to solve the problem of excess nitrates. Orenco® provided two different types of AdvanTex® Treatment Systems for the project.

Textile Filter Showcased in National EPA Study

On the edge of a fragile high-desert ecosystem, Bend, Oregon, had experienced booming development, resulting in a number of problems, including nitrate pollution. Nitrate "hot spots" in the aquifer were traced to high-density septic systems. With the county's population projected to double over the next 20 years, groundwater modeling suggested that nitrate levels would increase further.

In La Pine, Oregon, an EPA wastewater demonstration project included six of Orenco's AdvanTex Treatment Systems.

To complicate matters, nearly 1,800 lots near Bend had a shallow water table of two feet or less. Highly permeable pumice-derived soils gave little protection to the underlying aquifer – the main drinking water source – or to the nearby Deschutes River, an internationally famous trout stream. Environmental regulations prohibited some septic systems on lots with high water tables, and development was too dispersed for a centralized sewage system. Extreme temperatures in the cold, high-altitude desert posed additional challenges for wastewater treatment.

In the community of La Pine, Orenco Systems actively participated with the county and with state agencies to demonstrate an innovative technology for onsite wastewater treatment with advanced denitrification capabilities. Orenco provided design engineering and system components for two AdvanTex-RX30 and four AdvanTex-AX20 Treatment Systems, which use a highly absorbent textile treatment media.

Residential Market

Project Overview

LA PINE, OREGON

Design Parameters
- 250 gpd (946 L/day) typical average flow
- 340 gpd (1,287 L/day) actual average flow
- 450 gpd (1,703 L/day) design peak flow

Average Effluent Quality*
- 9.2 mg/L BOD
- 4.6 mg/L TSS
- 4.0 mg/L TKN
- 7.1 mg/L TN
- 2.3 mg/L NH_3
- 3.1 mg/L NO_3

Installation Date
- November 1998

Start-Up Date
- February 1999

Tanks
- 1,500-gal (5678-L), two-compartment tanks with an Orenco Biotube® Pumping Package

Treatment System
- Orenco AdvanTex RX30
- Recirculation: 1 minute on, 19 minutes off

Dispersal
- Three shallow pressure lines totaling 105 linear feet (32 m)

System Engineer
- Terry Bounds, P.E., of Orenco Systems

Contractor
- Habitat for Humanity (assisted by Orenco Systems)

** Samples collected and analyzed by a third party between June 1999 and July 2000.*

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One of the systems was installed in less than 12 hours at the first of two Habitat for Humanity houses and began operation in February 1999. Filtrate from the 4' x 8' x 2.5' prefabricated module recirculates through the processing tank, then to a pump basin for pressure discharge. Closely monitored by Oregon's Department of Environmental Quality (DEQ), this installation (along with a second one at the Habitat house next door) received additional third-party testing. These two sites were part of a National Community Decentralized Wastewater Demonstration Project funded through the EPA.

The EPA study was an effort to jumpstart technology transfer of innovative decentralized wastewater treatment and devoted considerable funds to demonstration projects in various states, including the one in La Pine. Rigorous monitoring and data sampling were used in the design and installation of additional denitrification systems in the area, and eventually, nationally.

Bijan Pour, Ph.D., was a soil scientist with the Oregon DEQ while the study was underway. He said, "The textile filter has the advantage of being much smaller than a sand filter. More important, this textile filter comes prefabricated, and we don't have the variability in performance [as with sand filters] depending on how clean and how well graded the sand is. To me as a regulator, this is very advantageous."

Pour continued, "It's also more convenient to install. A sand filter takes skilled labor to build onsite. This is a modular, prefabricated system. We plan to test for three years before we make any recommendations. Early indications are that the system is performing within our goals for most parameters. From what I see so far, I like it."

Treated effluent from one of the AdvanTex systems is dispersed through three shallow pressure lines totaling 105 linear feet (32 m).

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– Bijan Pour, Ph.D.
Soil Scientist, Oregon DEQ

For information about Prelos™ Sewer, AdvanTex® Wastewater Treatment, or Orenco Controls™, contact Orenco Systems®, Inc.

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All product and performance assertions are based on proper design, installation, operation, and maintenance according to Orenco's current published documentation. Data used by Orenco to derive the representations and conclusions contained within this Case Study were current as of July 2002.