

# CASE STUDY

## An Affordable Wastewater Collection and Treatment Solution for Government Properties

### STEAMBOAT RANGER STATION, OREGON

#### Problem

The aging gravity sewer lines for the Steamboat Ranger Station on Oregon's scenic North Umpqua River were being infiltrated by groundwater, increasing daily flows to more than three times peak design flow. Stopgap repairs to the sewer line would be expensive. In addition, the wastewater treatment plant serving the system was discharging directly into the river under an NPDES permit, and the required service and sampling cost \$25,000 per year. The agencies responsible for the station – the U.S. Forest Service and the Department of Transportation – needed to repair the system and reduce their annual expenses.

#### Solution

The agencies chose to decommission the aging infrastructure and install a watertight Orenco liquid-only (effluent) sewer, followed by Orenco's AdvanTex® recirculating media filter discharging to a drainfield. With onsite discharge, the NPDES permit became unnecessary. The State issued an onsite permit, and the maintenance contract dropped from \$25,000/yr to \$2,000/yr. Sampling requirements were also reduced, along with the high costs of maintaining the older treatment plant. As a result, payback on the brand new collection and treatment system was just 2.5 years, effluent quality was hugely improved, and no effluent at all is discharged into the wild and scenic river.

### AdvanTex System Preserves Protected Waters



The wild and scenic North Umpqua River is protected by an Orenco AdvanTex Treatment System at the Steamboat Ranger Station.

Photo courtesy of Ken Morrish.

The U.S. Forest Service (USFS) and the Oregon Department of Transportation (ODOT) had a costly wastewater problem. The Steamboat Ranger Station's 25-year-old collection system was being heavily infiltrated by groundwater, causing daily flows to exceed

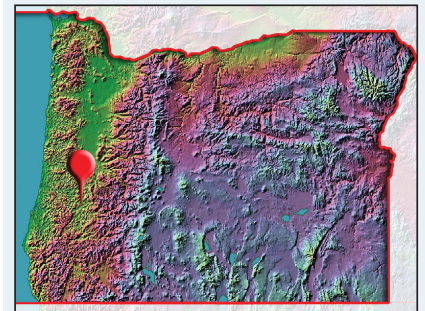
18,000 gpd for what should have been, at seasonal peak flow, a 5,000-gpd system. Infiltration was occurring even during dry months.

In addition, the outdated tertiary treatment plant was discharging directly into the North Umpqua River. To meet NPDES permit requirements, the system carried a \$25,000 annual maintenance contract to provide daily operator monitoring – a significant financial burden. The treatment system (an extended air package plant) used considerable electricity and substantial amounts of chemicals to ensure compliance with the stringent discharge limits into the Umpqua's scenic waters.

### Commercial — Government Market

#### Project Overview

#### STEAMBOAT, OREGON



#### Design Parameters

- 16 EDUs, mostly residential

#### Permit Limits

- 20 mg/L BOD
- 20 mg/L TSS

#### Effluent Quality\*

- 3.1 mg/L BOD<sub>5</sub>
- 2.4 mg/L TSS

#### Installation Date

- June, 1999

#### Start-Up Date

- October, 1999

#### Total Project Costs

- \$150,000

#### Collection System

- 1" service lines
- 2" main lines

#### Primary Treatment

- Sixteen 1,500-gal. (5.67-m<sup>3</sup>) concrete tanks

#### Secondary Treatment

- Two 1,500-gal. (5.67-m<sup>3</sup>) concrete recirc tanks
- Four AdvanTex AX40 treatment pods

#### Dispersal

- Shallow gravelless drainfield

#### Operation

- One part-time operator
- Semi-annual testing

#### Engineer

- Terry Bounds, P.E., Orenco Systems, Inc.

\*Samples collected between 1 October 1999 and 16 July 2013.

**STEAMBOAT RANGER STATION, OREGON**

Jim Van Loan, owner of the nearby Steamboat Inn, hoped to expand his capacity for housing visiting fly fishermen from around the world during the busy summer months. Van Loan began discussions with the agencies about subleasing several houses on the ranger station site. Both agencies were interested, but the cost of operating the wastewater treatment plant made it difficult to justify the arrangement. Repairs on the leaky gravity sewer were estimated to cost nearly \$80,000. These repairs could mitigate (but not eliminate) some of the problems the system was experiencing, and the agencies would still be required to maintain their annual maintenance contract to meet the provisions of their NPDES permit.

Van Loan had ten years of positive experiences with an Orenco-designed wastewater treatment system at the Inn. So he suggested bringing in Orenco to discuss the merits of a small liquid-only (effluent) sewer for the Ranger Station, followed by Orenco's AdvanTex textile filter for treatment. After several years of planning, USFS and ODOT installed those technologies, which resulted in dramatically lower operational costs, as well as improved performance and elimination of wastewater discharge into a scenic waterway. "We have a system in place that cost the state about \$7,000 in operating expenses the first year, versus \$25,000," explains Van Loan.

Following the first year of operation, the DEQ approved a semiannual, instead of a monthly, testing procedure because of the system's outstanding performance. As a result, annual operating costs dropped to \$1,455, and capital costs of the new system were paid off in 2.5 years.

Regular monitoring and maintenance have shown outstanding effluent quality. An advanced remote telemetry control system monitors daily activity and reports servicing needs, alarms, or any abnormalities. In the 14 years since the system began operating, BOD<sub>5</sub> and TSS performance levels have averaged 3.1 mg/L and 2.4 mg/L respectively, even though the system has sustained a few extreme overloads. For example, during the 2002 fire season, daily flows quadrupled, and design flows were exceeded by up to 100%± over the course of a week, when hordes of firefighters were billeted at Steamboat. Nevertheless, an inspection showed no discernible decline in system performance or effluent quality. BOD<sub>5</sub> and TSS during that period of time averaged 2.9 mg/L and 1.5 mg/L, respectively.

Back in the thirties, Zane Grey walked the slippery slopes of the North Umpqua River in search of the perfect steelhead. Today, people come from all over during the summer months to tackle the 31 miles of "fly-fishing only" water. And thanks to the advanced treatment provided by the AdvanTex Treatment System, as well as the foresight of ODOT, the waters will continue to remain clean and clear, for generations of steelhead to come.

**Commercial —  
Government Market**

*"We have a system in place that cost the state about \$7,000 in operating expenses the first year, versus \$25,000."*

— **Jim Van Loan**  
Steamboat Inn Owner

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



800-348-9843 • +1 541-459-4449  
www.orenco.com

Data used by Orenco to derive the representations and conclusions contained within this Case Study were current as of February 2014.