CASE STUDY

An Affordable Wastewater Collection and Treatment Solution for Municipalities and Communities

ELKTON, OREGON

Problem In the late 1980's, individual onsite septic systems along the Umpqua River in Elkton, Oregon were failing, threatening the river's water quality and limiting business expansion. The community needed a cost-effective, environmentally sound solution for its wastewater problem.

Solution In 1989, a watertight Orenco® Effluent Sewer was installed, which safely conveys effluent from about 100 onsite systems, including restaurants, schools, and other commercial establishments. Effluent quality is outstanding and is dispersed to an 11,000 linear ft (3,353 m) drainfield. Homeowners pay a monthly fee of $33.75, which includes system payback and regular maintenance.

Effluent Sewer and Recirculating Sand Filter Provide Superior Treatment at Low Cost

This view shows the community of Elkton, Oregon, with its 100 residences, stores, restaurants, and schools.

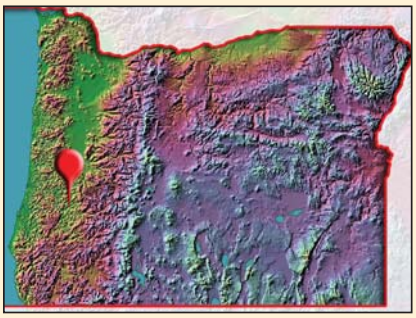
In the late eighties, individual septic systems in Elkton, Oregon — along the beautiful Umpqua River — were failing, threatening the river's water quality. In addition, the septic systems were limited in capacity, and merchants realized they couldn't expand their businesses without making improvements.

In 1989, Elkton installed a watertight Orenco® Effluent Sewer that conveys effluent from about 100 onsite septic systems — of which ⅓ are gravity (STEG) and ⅔ are pump (STEP) — to a 60' × 120' (18 m × 37 m) recirculating sand filter (RSF) designed to treat 30,000 gallons per day (114 m^3/d). The primary treatment in the effluent sewer collection system provides approximately 70% BOD_5 reduction and 90% TSS reduction (in residential-strength wastewater) — before any secondary treatment in the recirculating sand filter takes place. Final dispersal of the treated effluent is to a sequentially dosed drainfield consisting of 11,000 linear feet (3,353 m), divided into 12 zones.

Municipal and Community Market

Project Overview

ELKTON, OREGON



Design Parameters
- 147 EDUs, mostly residential
- 79 STEP units, 34 STEG units

Effluent Quality*
- BOD_5 and TSS < 10 mg/L for both (see chart on second page)

Installation Date
- 1989

Project Cost
- $897,800 (includes engineering, construction, and inspection)

Funding Sources
- 71% grants, 29% loan

Fees
- $33.75/month residential

Primary Treatment
- Residential: 1,000-gallon (3.8 m^3), one-piece construction, single compartment concrete tanks fitted with effluent filters or screened pump vaults.
- Commercial: Larger than 1,000-gallon (3.8 m^3) tanks and/or multiple tanks

Secondary Treatment
- 30,000 gpd (114 m^3/d) recirculating sand filter

Dispersal
- 11,000 LF (3,353 m) drainfield on 6 acres (2.4 ha)

Operation and Maintenance
- Alarm calls average 4-5 per year
- Collection and treatment systems require one part-time operator

** Samples collected between 2/8/92 and 4/3/03.*

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ELKTON, OREGON

Even with the addition of three wineries to the system, (which produce higher-strength waste,) effluent quality is excellent. After treatment by the RSF, effluent dosed to the drainfield averages less than 10 mg/L for both BOD_5 and TSS. "The river is a big part of our lives, so protecting it is a priority. Orenco's recirculating sand filter does an excellent job at a cost we can afford," says Linda Higgins, Elkton's City Manager.

Grants funded 71% of system costs and, with a total cost of $897,800, the average installation was less than $7,000 per connection. The cost to homeowners continues to be minimal. After an initial $3,500 connection charge (89% placed in a repair and replacement fund), homeowners pay a monthly fee of $33.75, which includes system payback and regular maintenance. Maintenance is also minimal, averaging less than an hour per day for routine upkeep of the collection system and for recording daily meter readings for the RSF and dosing pumps. "We've replaced a few pumps and solenoids — but think what they're sitting in!" says Higgins. "We really love the system — talk about maintenance free!"

The community of Elkton found a cost-effective, environmentally sound solution to its wastewater treatment needs. And because only two-thirds of the system's capacity is being used, Orenco's effluent sewer technology will serve Elkton long into the foreseeable future.

RSF INFLUENT AND EFFLUENT AVERAGES

Year	**Biochemical Oxygen Demand** (BOD_5) (mg/L)		**Total Suspended Solids** (TSS) (mg/L)	
	Influent	*Effluent*	*Influent*	*Effluent*
• 1992	—	12.5	26	—
• 1993	134	4.3	40	5.1
• 1994	114	2.9	30	4.3
• 1995	122	3.9	40	11.0
• 1996	92	2.3	46	4.0
• 1997	128	5.5	38	7.7
• 1998	130	3.3	29	5.0
• 1999	146	3.2	33	5.2
• 2000	111	3.8	30	4.7
• 2001	101	3.1	28	4.2
• 2002	167	5.0	38	7.0
• 2003	161	5.3	28	7.7
• 2004	190	5.0	35	8.5
• 2005	239	7.3	41	6.6
• 2006	253	6.9	63	7.2
• 2007	216	6.8	45	5.8
• 2008	145	9.0	54	12.2
• 2009	270	5.7	38	8.3
• 2010	468	8.7	50	14.6

Data used by Orenco to derive the representations and conclusions contained within this Case Study were current as of June, 2011.

Municipal and Community Market

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– Linda Higgins
Elkton City Manager

For more information about effluent sewers, Orenco Sewers™ and AdvanTex® Treatment Systems, contact Orenco Systems®, Inc.

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