CUSTOM SOLUTIONS USING Liquid-Only Sewers



# Wastewater Solutions

## Affordable Wastewater Collection Solutions from Orenco Systems®

Liquid-only (effluent) sewers have proven to be a cost-effective solution for municipalities, new subdivisions, and a variety of other areas in need of sewer. As opposed to the "big pipes" and deep excavations typically required by gravity sewers, liquid-only sewers use small-diameter, shallowly-buried mainlines that follow the contour of the land and are easily installed with light-duty equipment, minimizing disturbance to the surrounding area. Because of their affordability, liquid-only sewers have been installed by hundreds of communities over the past several decades. Many of these sewers have now been providing reliable service for more than 35 years.



Treated effluent from the Glide liquid-only sewer is pure enough that it can be safely released through this pipe into the pristine North Umpqua River, a popular fly-fishing destination.

## Glide, Oregon

### Liquid-only sewer sets new standard

In the late 1960's, on-site septic tank and drainfield failures were common in the unincorporated community of Glide. One after another, three different engineering firms attempted – and failed – to find an affordable solution. In 1973, the county health department enacted a moratorium on any further development in the area.

For the next couple of years, the county's Department of Public Works studied several options and compared both up-front and long-term costs for a system designed to serve about 2,300 equivalent dwelling units (EDUs). The county researched gravity sewers, vacuum sewers, and pressure sewers, including both grinder and liquid-only (effluent) sewers.

When the evaluations were done, the department proposed a liquid-only sewer that could eventually serve 7,000 residents. The initial cost of the system would be roughly \$10,250 per EDU in today's dollars. It would be the largest of its kind in North America and would set a standard for innovative design by demonstrating that small communities have more wastewater options than traditional wisdom dictated.

The Glide sewer system includes more than 20 miles of small-diameter mainline piping over hilly terrain, with no need for lift stations. It currently serves more than 1,100 EDUs, both residential and commercial.

#### Design Features of LIQUID-ONLY (EFFLUENT) SEWERS

In a liquid-only sewer system (also known as an "effluent sewer"), the onsite primary tankage provides passive anaerobic digestion, so tank pumpouts are infrequently needed. And the settling of solids in the tanks makes possible the use of inexpensive, durable pumps. These pumps are lightweight and can last more than 25 years.\* The cost-effectiveness of the pumps, combined with infrequent tank pumpouts, translates to low solids management and equipment repair and replacement costs.

Primary-treated effluent from the tank is conveyed by the pumps through small-diameter mainlines to the treatment facility. The lower organic and solids load from the liquid-only sewer provides a substantial reduction in power costs, as well as operation and maintenance costs, at the facility.\*\* Also, the reduced organic load of the liquid-only system means that designers can decrease the size and associated capital expense of the treatment facility.\*\*

\* As seen in the Glide and Elkton, OR, and Diamond Lake, WA, sewer systems. \*\* As seen in the Montesano, WA, sewer system. Affordable Wastewater Collection Solutions from Orenco Systems



Operators of the liquid-only sewer in Lacey have had more than 25 years to perfect their routine maintenance procedures.

## Lacey, Washington

Unique hybrid collection system fills niche

Lacey, Washington, grew rapidly between 1980 and 2000. The town needed an affordable wastewater solution to support construction in the Urban Growth Area it shares with neighboring communities. Lacey chose an Orenco Systems liquid-only (effluent) sewer, which discharges into the city's gravity sewer lines, creating a hybrid collection system. Now, more than 25 years later, the system successfully serves about 12,250 gravity sewer connections and almost 3,400 liquid-only sewer connections.

Over the years, its operators have developed experience and expertise in maintaining this hybrid sewer system. Since 2007, service callouts for unplanned maintenance have been stable, averaging 5-6% of systems in service\*, or about four calls per week.

\* Derived from Tables 19 and 20, Comprehensive Annual Financial Report, City of Lacey, December, 2017.

## Camas, Washington

*Hilly topography no problem for liquid-only sewer* 

In the late 1980's, the city of Camas was considering how to bring sewer service to a commercial property on the outskirts of the city limits. Hilly topography meant that installing gravity sewer would require some expensive lift stations.

But the city engineer recommended a much less-expensive option: liquid-only (effluent) sewer. This type of sewer used small-diameter mainlines that would follow the contour of the land and be easier to install than the large pipes needed for gravity sewer.

City leaders followed that recommendation, and the Camas sewer system now has about 6,000 connections, both residential and commercial.



About 4,000 residents of Montesano enjoy the reliable service of the city's lower-cost liquid-only sewer.

# Montesano, Washington

### Liquid-only sewer a better option than gravity

Installed in 1991, Montesano's liquid-only (effluent) sewer system has over 1,500 connections. It replaced an antiquated gravity sewer that suffered extreme infiltration and inflow. Initially, the city's engineer proposed a new gravity sewer system. However, because of tight lot constraints, the 1.5year expected installation time, and the physical disruption a gravity sewer installation would cause, the city council and public works department requested that other options be presented.

Montesano's liquid-only sewer system was installed in half the time and at a lower cost than the proposed gravity sewer, and it allowed the town to convert the existing gravity sewer to a storm sewer and to reduce the size of the wastewater treatment plant.

## Southwest Barry County, Michigan

# *Less maintenance needed for liquid-only systems*

To preserve and improve water quality, this Michigan lake county has had an Orenco liquid-only sewer system since 1993. These sewers are also known as "effluent sewer" or "STEP" (septic tank effluent pump) systems.

The collection system began with more than 1,200 Orenco on-lot STEP units, which have been so dependable that almost a thousand more have since been installed.

The county also maintains about 250 homes with grinder sewer systems. Scott Monroe started as the superintendent of the county's sewer and water authority in 1993 and is now the general manager. He says, "The county gets more service callouts for grinder systems than for STEP. The STEP systems are the preference for replacements and new construction."

Data used by Orenco to derive the representations and conclusions contained within these Project Profiles were current as of September 2019. Orenco Systems, Inc. • 800-348-9843 • +1 541-459-4449 • www.orenco.com

