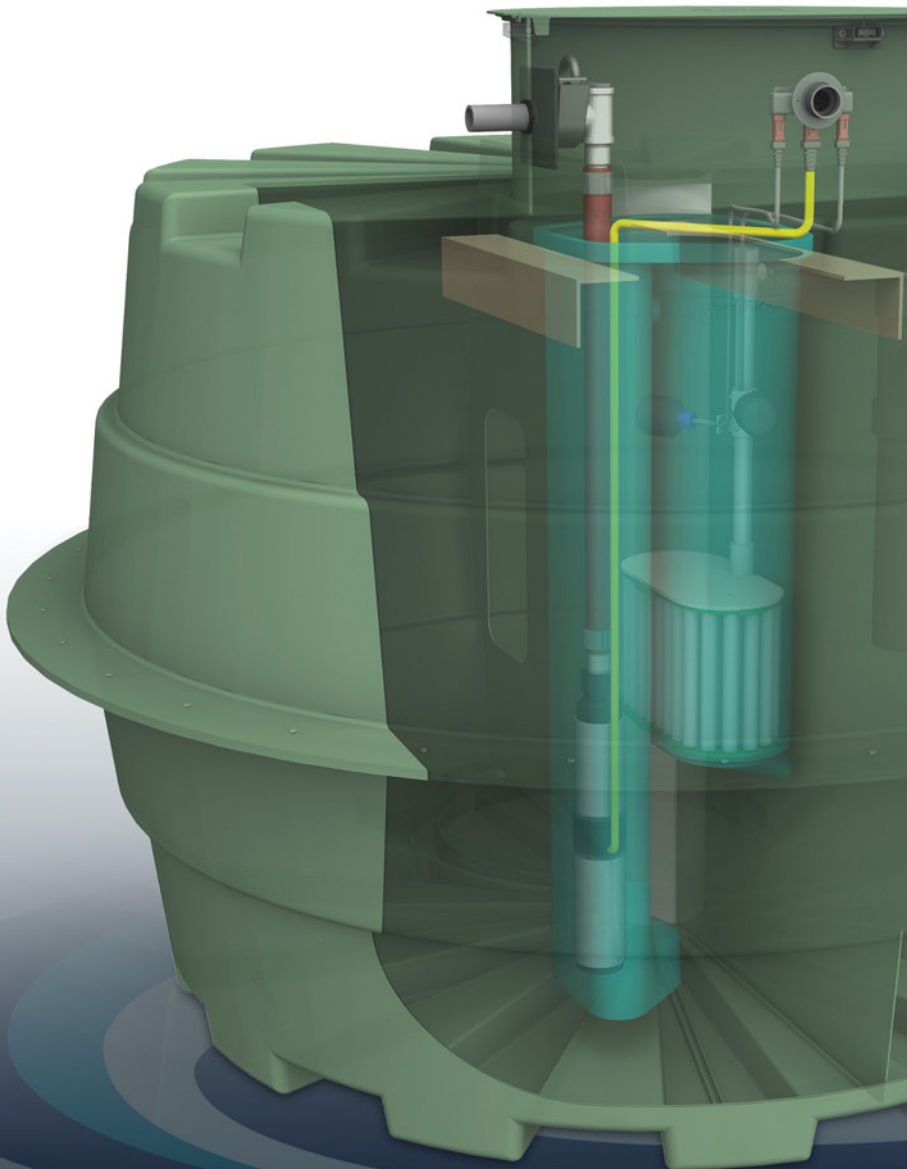


Prelos™

The Sewer Solution

"Sustainable development ... meets the needs of the present without compromising the ability of future generations to meet their own needs." — Brundtland Report, 1987.



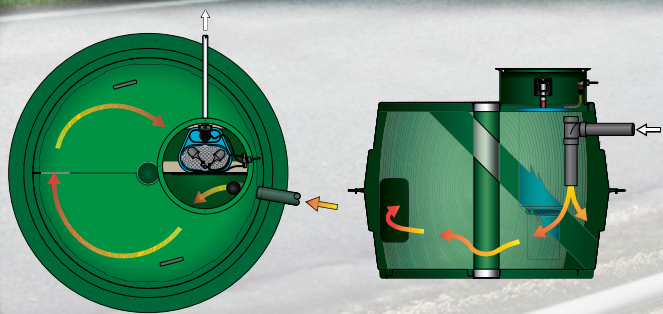
Choosing a sewer system is one of the most important decisions a community can make. It's a decision that will affect the community for decades. Prelos™ provides an efficient, affordable, and sustainable solution for the thousands of towns across the country in need of sewer infrastructure, whether it's new, an expansion, a repair, or replacement.

The Prelos Sewer Collection System is based on concepts that've been in use for more than 50 years. It's the culmination of technologies Orenco's been developing and refining since 1981.



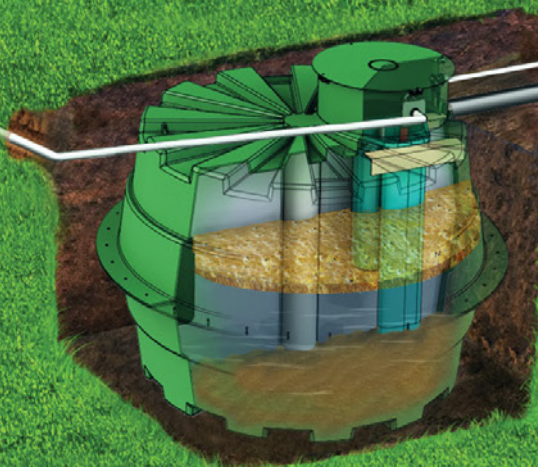
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Prelos™



Prelos Processor™

The Prelos Processor™ you see here is an all-in-one, complete unit that's easy to specify and install. It provides primary wastewater treatment and solids removal at the source



How It Works – Prelos™ Collection System:

- Prelos™ uses small-diameter, pressurized, shallow-buried pipes that follow the contour of the land.
- Mainlines are often installed with directional boring, which doesn't require trenching, and can be installed without disrupting businesses, roads, and utilities.
- Like water mains, Prelos Sewer mains can be "surgically" extended to specific areas, streets, or new developments that need service most.
- Prelos reduces the volume of biosolids and final treatment costs.^{i, ii}
- The cost to make Prelos Sewer mains available for connections can be as low as 10% of the cost of gravity sewer mains.ⁱⁱⁱ

Prelos Processor™: Features & Benefits

- All-in-one, complete unit
- Primary treatment and solids removal at the source
- No cost to install or maintain until customers connect
- Engineered to be watertight
- Made of lightweight DCPD, ideal for a buried tank
- Maximum solids reduction via patented meandering flow path
- Passively self-cleaning pump vault
- Simple to maintain with basic tools and equipment
- Easily serviced pumps and controls, thanks to Orenco's ClickTight™ Wiring Connection System

ⁱ *Alternative Sewer Systems Manual of Practice FD-12*, second edition, published by the Water Environment Federation (WEF) 2008.

ⁱⁱ As seen in the Montesano, Washington, sewer system.

ⁱⁱⁱ As seen in the Vero Beach, Florida, sewer system.

The Prelos Processor pump package includes:

- Passively self-cleaning Biotube® Pump Vault (patent-pending)
- HDA Discharge Assembly with high-head pump
- Biotube Effluent Filter
- ClickTight™ Wiring Connection System



Potters Mills, PA

The area around Potters Mills, a village in central Pennsylvania, has a long history of failing septic systems. In an evaluation performed by the local sewage enforcement officer, 72% of the on-lot septic systems in the proposed service area for Potters Mills had confirmed or suspected malfunctions.¹

Located about 3.5 miles (5.6 km) from the closest city sewer system, Potters Mills needed an effective, affordable wastewater collection and treatment system that was easy to install, operate, and maintain with minimal disruption to residents' daily lives. The governing Potter Township chose an Orenco® Prelos™ Wastewater Collection System, followed by an Orenco AdvanTex® Wastewater System for advanced treatment.

Potter Township owns, operates, and maintains the collection system, from the Prelos Processor inlets to the treated effluent discharge outfall. They also own and operate the AdvanTex treatment facility, which is located near the northern end of the service area, next to a community park and about 200 feet (61 m) from the nearest home. The AdvanTex facility can be expanded in four phases to eventually handle up to 170 equivalent dwelling units (EDUs).

¹ Sewage Enforcement Officer Status Report, Potters Mills, March 3, 2015.

Vero Beach, FL

Along the Indian River Lagoon adjacent to Vero Beach, Florida, both residents and government officials were becoming increasingly concerned about excessive nutrient loads and pollution. About 1,500 homes in Vero Beach had septic systems, many of which were antiquated and failing. Experts believed that the failing onsite systems were a major contributor to the environmental degradation of the lagoon, loss of sea grass habitat, and the unexplained deaths of manatees and dolphins.



The City of Vero Beach installed an Orenco Liquid-Only Sewer consisting of directionally drilled, small-diameter mainlines and individual STEP (septic tank effluent pump) packages. Primary-treated effluent from each residential or multi-family property is ultimately conveyed to the city's existing centralized wastewater treatment plant.

At full build-out, with an estimated 1,500 residences connected to the city's liquid-only sewer, water quality in the Indian River Lagoon is expected to improve considerably. In its news release, the water management district reported that "the STEP project will divert septic system effluent ... preventing up to 40,500 pounds [18,370 kg] of nutrients per year from entering the groundwater."²

Replacement of failed septic systems will result in fewer pollutants ending up in the lagoon. Local officials are confident this will be a boon to the dolphins, manatees, and other wild creatures that make their home in these vital waters. The first on-lot systems were installed in April of 2015. Nearly five years later, Robert Bolton, Vero Beach's Director of Water and Sewer, describes the system's operation as "excellent, with no issues."

² St. Johns River Water Management District, District partners with Vero Beach to improve lagoon water quality, (news release, Palatka, Florida, February 13, 2015).

Lacey, WA

The City of Lacey was an early adopter of Orenco Liquid-Only Sewer. The community's first effluent sewer mains were installed in 1986. Orenco staff worked closely with the city to design an effective maintenance schedule that would provide residents with a sustainable and affordable level of service. "We truly appreciate the effort that Orenco has made in doing what they can to reduce our costs and effort," said Terry Cargil, City of Lacey Water and Wastewater Supervisor. The city now has over 3,200 Orenco Sewer connections and almost 50 miles of small-diameter effluent sewer mains.

Christiansburg, OH

The smell of sewage was becoming harder to ignore in Christiansburg, especially following a rainstorm. The village was plagued with failing onsite septic systems, and nearby West Fork Honey Creek had tested high for bacteria. With the Ohio EPA becoming concerned, village leaders began to explore wastewater management options.

Because Christiansburg has roughly 500 residents with a 2013 median income of just \$34,282,³ village leaders needed an affordable solution. For collection, they chose an Orenco Liquid-Only Sewer, which includes individual 1,000-gallon (3.8-m³) tanks for residences and 1,500- (5.7-m³)

or 2,000-gallon (7.6-m³) tanks for businesses. All tanks contain an Orenco septic tank effluent pump (STEP) package. The collection system conveys primary-treated effluent through small-diameter mainlines, without manholes or lift stations, to a two-stage AdvanTex® AX-Max™ treatment facility. Disinfected effluent from the AdvanTex system is then discharged to West Fork Honey Creek under the authority of an NPDES permit with strict ammonia limits. The engineer who designed the Christiansburg project said, "This was my first time working with Orenco, and it's been a success without a doubt. I am actively seeking new projects we can work together on in the future."

³ City-Data. Christiansburg, Ohio. Accessed September 9, 2015. <http://www.city-data.com/city/Christiansburg-Ohio.html>

SW Barry County, MI

To preserve and improve water quality, this Michigan lake county has had a liquid-only sewer system since 1993. 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, "I've analyzed historical data and we easily get three times the repair callouts for grinder systems as we do for our effluent sewer systems. Also, the duration of grinder unit service calls is twice as long as for the STEP units. I haven't had one employee in 26 years that preferred grinder systems over effluent sewer systems – not one!"



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ABR-LOS-1
Rev. 1, 09/2020

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