

# Community Systems FAQ

*Effluent sewers and advanced treatment technology have improved so dramatically over the past several decades that these “decentralized sewer systems” are now highly recommended by the U.S. Environmental Protection Agency. Since 1981, Orengo Systems has worked with hundreds of communities to solve their wastewater problems with reliable, cost-effective effluent sewers and advanced treatment technology. Following are some frequently asked questions:*

- **Does every residence in an Orengo Effluent Sewer System require an On-Lot Septic Tank Effluent Pumping (STEP) system?**

No. Depending upon the elevation of the interceptor tank and the pressure in the collection main, certain connections, referred to as Septic Tank Effluent Gravity (STEG) systems, can gravity flow into main lines. Relatively simple hydraulic analyses are required to determine which connections require STEP systems and which permit STEG systems. Orengo Effluent Sewers can be entirely STEP or STEG, or any combination thereof, depending upon the results of the hydraulic analyses.

- **Gravity sewer systems, and at times grinder sewer systems, frequently require lift/pump stations to convey wastewater to the point of discharge. Do Orengo Effluent Sewer systems require lift stations?**

Lift stations are generally not required with Orengo Effluent Sewers, even when the point of discharge is located miles away from the point of wastewater generation. Main lines are normally sized to allow communities to standardize on a single high-head effluent pump for their on-lot STEP systems, typically 10 gallons per minute (gpm) and ½ hp, throughout.

- **In existing neighborhoods, conventional gravity sewers are normally installed under existing roads, often requiring road removal, replacement, and closures. Where are Orengo Effluent Sewers typically installed, and are road closures common?**

Orengo Effluent Sewer mains are generally installed in the right-of-way next to the road, thus avoiding road removal, replacement, and closures. Main lines are typically small diameter, often just 2 inches in diameter. Main lines follow the contour of the land and are installed at shallow burial depths, below frost depth, much like water lines. As a result, small, open trench installation is common. Directional boring — a trenchless method for installing small diameter pressure pipe — is also used to install main lines. Directional boring significantly reduces the construction trauma and elevated costs associated with avoiding utilities and driveways in existing communities.

- **Do I need to replace my septic tank if an Orengo Effluent Sewer system is installed?**

Probably. Some communities have used existing septic tanks in an Orengo Effluent Sewer, but that is rare. Existing tanks require a thorough evaluation to confirm watertightness and structural integrity. Older tanks are often leaky and structurally inadequate, leading to increased infiltration, less efficient solids digestion, compromised secondary treatment processes, and higher maintenance costs. However, recently installed tanks built to sound specifications are definitely worth evaluating.

- **Septic tanks are normally pumped out at intervals of three years or less. How often do the on-lot interceptor tanks used in Oreco Effluent Sewers require pump-out?**

Typically 7-12 years. Septic tank pump-out intervals are generally mandated by local health departments, and they are based upon short-term solids accumulation studies that fail to take into account long-term solids-decomposition in interceptor tanks. The microbial activity that optimizes decomposition takes up to three years to develop fully. When a management program is in place, pump-outs are scheduled based on sludge/scum inspections and monitoring records so that costs are controlled. Onsite regulations and manuals may encourage frequent pump-outs as a precautionary measure when an inspection program is not in effect; however, longer intervals are usually justified, particularly if an effluent screening device is in place. At a 95% level of confidence and assuming the national average of 2.5 people per home using a 1,000-gallon interceptor tank, pump-out intervals between 10 and 12 years are not uncommon.

- **Are Oreco Effluent Sewers odorous?**

No. Odors are not common in Oreco Effluent Sewer systems that are well-designed, correctly installed, and properly operated because interceptor tanks vent naturally through building stacks and effluent sewer mainlines are completely enclosed and watertight. However, when discharging an effluent sewer line into an existing gravity sewer, hydrogen sulfide can be generated and control measures may be necessary to combat odor and corrosion. These control measures include aeration, carbon filtration, chemical addition, etc.

- **Do Oreco Effluent Sewers have higher operation and maintenance costs compared to traditional gravity sewer systems?**

No. Fact Sheets developed by the Water Environment Research Foundation show that O&M for effluent sewers is slightly less than O&M for gravity sewers.<sup>1</sup> In our experience, it is considerably less. Although gravity sewers have a low initial O&M cost, as they age, I&I (inflow & infiltration of extraneous water), expensive R&R (renewal and replacement), expensive system failures, SSO's (sanitary sewer overflows) and replacement of on-site laterals have substantial cost implications. Growing communities often offset these O&M costs with new (and therefore low-maintenance) connections. However, small communities with aging systems generally lack the new connections that help to fund capital improvements for repair of aging infrastructure. Oreco Effluent Sewers and AdvanTex Treatment Systems offer an affordable, low-cost alternative with reduced O&M requirements and lower life-cycle cost requirements. Substantial savings are achieved through reduced infiltration and inflow, reduced biosolids production, reduced energy consumption, and less costly collection and treatment system infrastructure.

<sup>1</sup> Fact Sheet C1, "Collection Series, Gravity Sewer Systems" and Fact Sheet C3, "Collection Series, Effluent Sewer Systems," April 2010

- **What is your experience with access and easements for effluent sewer equipment located on private property?**

Property that has been platted with Oreco Effluent Sewers typically includes easements for operation and maintenance access. Recording easements for existing communities can be challenging, although service tariffs, often used by power and phone companies, have been employed successfully. Customers who insist on an easement can be accommodated by being charged for the cost of the survey and the recording of the easement.

- **Can Orengo Effluent Sewers be upsized affordably to serve future connections/developments?**

Yes. Orengo Effluent Sewers are easily oversized to accommodate future connections, at relatively low up-front and ongoing costs, due to the lack of solids in the main lines. Because up to 85% of the cost of Orengo Effluent Sewers is associated with on-lot equipment packages (STEP packages), the cost to upsize/oversize conveyance system infrastructure (a network of small diameter PVC or polyethylene pipe) is minimal ... typically a small percentage of total project costs. Conventional gravity sewer collection systems, on the other hand, require expensive, large diameter gravity mains that are costly to oversize and maintain and comprise the majority of the cost of traditional sewer programs.

- **Can Orengo's Effluent Sewers be integrated into existing municipal infrastructure?**

Yes, countless effluent sewers convey primary treated effluent to existing gravity collection system infrastructure, lagoons, package plants, and any other secondary treatment process. Because Orengo Effluent Sewers provide primary treatment, secondary treatment technologies can be downsized.

- **Have other communities implemented similar solutions?**

Hundreds of communities have installed Orengo Effluent Sewer systems and/or AdvanTex Treatment Systems throughout the United States and internationally. Dozens of case studies are available, as well as operator/utility references or site visits.

- **Do Orengo Effluent Sewer systems require an AdvanTex Treatment System following them?**

No. Although AdvanTex Treatment Systems are manufactured and designed specifically to process effluent sewer wastewater affordably and reliably, several other secondary treatment processes can be paired with Orengo Effluent Sewers. Plus, nearly all types of secondary treatment processes can be downsized with effluent sewers, as effluent sewers are the only technology that provides primary treatment.

- **Do AdvanTex Treatment Systems require full-time operation and maintenance oversight?**

No. AdvanTex Treatment Systems, unlike systems that use conventional activated sludge processes, are renown for their low operation and maintenance requirements. Consequently, full-time oversight and operation are not required. AdvanTex treatment systems incorporate small, low hp pumps that operate a fraction of the day. Control systems are straightforward with no need for continuous oversight and process manipulation.

- **Can AdvanTex Treatment Systems be manipulated, in the future, to address more stringent discharge limits?**

Yes. While AdvanTex Treatment Systems consistently and reliably produce effluent low in BOD<sub>5</sub>, TSS, and nitrogen, they are easily paired with or followed by tertiary processes for further constituent removal, including disinfection, nutrient removal, etc.

- **Can AdvanTex Treatment Systems be easily expanded to serve future connections/development?**

Yes. AdvanTex Treatment Systems, unlike other technologies, are modular in nature, allowing communities to ‘phase-in’ treatment systems and resulting in capacity-on-demand. Communities anticipating growth or service area expansion can easily install additional AdvanTex filters in parallel with existing infrastructure to accommodate future connections. This defers up-front capital costs and operational costs until growth or expansion actually occurs.

- **Do Orenco’s integrated/complete systems with Effluent Sewer and AdvanTex Treatment require mandatory connections upon system commissioning?**

No. Mandatory connections are not required with Orenco Effluent Sewers and AdvanTex Treatment Systems. Residents with on-site systems that have been approved by local regulators have the option of deferring connections because up to 85% of the cost of Orenco Effluent Sewers (up-front and future O&M) is associated with the on-lot equipment packages, not the sewer lines. In addition, AdvanTex Treatment Systems facilitate capacity-on-demand. On the other hand, because of their large up-front capital costs, conventional sewer systems with gravity collection lines and package treatment plants cannot “phase in” their systems; they require mandatory connections to fund their high costs.