MULTIFUNCTION TANK IS INTEGRAL TO INNOVATIVE WASTEWATER TREATMENT

APPLICATION
Wastewater

HIGHLIGHTS
- Part of innovative "natural" wastewater treatment
- Lightweight fiberglass tank easily installed in tight footprint between two rows of solar panels
- Three compartments provide three functions in treatment and storage process

PRODUCTS
10'-diameter single-wall underground tank

TOTAL CAPACITY
25,000 US gallons

LOCATION
Oregon, USA

THE ROLE OF NATURE IN WASTEWATER TREATMENT

Before fiberglass, metal or concrete was used to convey or store wastewater, hollowed-out tree trunks and clay pipes were used. Naturally occurring bacteria are still the most commonly used method for treating wastewater in municipal treatment plants. Where other options aren't readily available, soil can be an effective medium for treating and dispersing wastewater.

Today, the latest wastewater technology advancements include looking to nature as part of the solution. The EPA defines natural wastewater treatment systems as those "having minimal dependence on mechanical elements to support the wastewater treatment process." In place of mechanical elements, a natural system uses plants and bacteria to break down and neutralize pollutants.

OFFSETTING A PROJECT'S CARBON FOOTPRINT

When the owners of Panelview RV Park upgraded their septic system in 2020, they wanted to offset their business' carbon footprint as much as possible. The 49-unit RV park in northeastern Oregon uses solar power from a 148 kilowatt solar farm, and has a solar panel at each park site.

Beyond a green-value choice, site parameters and water scarcity meant that environmental innovations for the system were also a matter of necessity. The RV park is in a sensitive groundwater area, located within 1,000 feet of the Umatilla River. The aquifer in the predominantly agricultural area is contaminated with nitrates. And with a limited amount of well water available – with a maximum draw of 5,000 gallons a day – they didn't have enough water for landscaping.

USING TREE ROOTS TO TREAT WATER FOR IRRIGATION

Panelview's CEO and co-owner Kent Madison worked with the Oregon Department of Environmental Quality and Ecolotree Inc., an Iowa-based engineering company, to develop a wastewater system that incorporated the patented tertiary treatment concept PhAGR® (Phyto Attached Growth Reactor). In the PhAGR system, willow and poplar tree roots create the primary carbon supply that feed microbes, which in turn mineralize and degrade organic molecules.

MULTIFUNCTION TANK IS INTEGRAL TO INNOVATIVE WASTEWATER TREATMENT SYSTEM

This microbial action is essentially the same that occurs in common water-treatment technology options. One advantage of PhAGR is that it produces significantly more carbon as energy-supporting microbes. Greater aerobic activity means that the tertiary treatment can be faster and more thorough. At Panelview, the system includes 48 bags of willow and poplar cuttings set in pearlite rock above a 2-foot-deep drain layer of basalt rock. (See image below for a view of the site's PhAGR system.)

CONSOLIDATING THREE FUNCTIONS IN ONE FIBERGLASS TANK

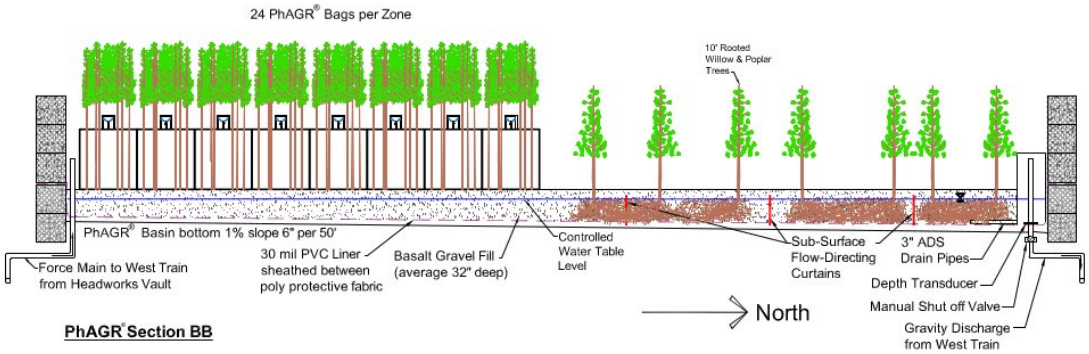
To fit into this innovative system, Panelview needed a tank that could be easily customized to serve multiple functions. It also had to be easy to deliver and install in a tight excavation footprint, which was between two rows of solar panels. Beyond that, the installation process had to be easy and straightforward since Madison was installing it himself. Our lightweight corrosion-resistant tank met these needs.

"The beauty of your tank," says Madison, "is that it comes all in one unit. It's a complete storage system that just needs to be set in place. It was delivered on a semi and all I needed was a simple crane. Within two hours, it was in the ground. If it had been a large concrete tank, it would have been delivered on several trucks, and it would have taken a lot longer to install and required many more piping connections."

The three-compartment 25,000-gallon tank, with baffles separating the chambers, serves three separate functions:

- a 15,000-gallon primary treatment compartment where large particles are reduced and partially solubilized before the wastewater flows through a perforated baffle into the next compartment
- a 5,000-gallon compartment for wastewater to be held for further digestion before it is pumped into the PhAGR system with Orenco pumps
- a 5,000-gallon recirculation compartment for wastewater from the PhAGR's tertiary treatment before it is dispersed into a subsurface drip system

Flow control, pumping, filtration, valving, pipe connections and alarms are located in a control vault installed near the tank. Tank access risers make it easy to monitor and maintain the system. Wastewater flows back and forth between the PhAGR zones and the fiberglass tank through an underground system of piping. The system's piping and controls can operate in different modes to achieve the most efficient treatment. For instance, drainage can flow to be collected in the recirculation compartment until needed or it can flow directly to the drain field to be used for irrigation.



CHOOSING MATERIALS AND SYSTEMS FOR LONG-TERM ECO-FRIENDLY RESULTS

Early testing of the treated wastewater shows "outstanding results – even better than expected," according to Madison. When it comes to the tank, Madison expects the same positive results. "I wanted a tank that would be here for a long time, and wouldn't have the environmental risks of rusting or leaking."

Whether it's employing nature to treat wastewater, choosing corrosion-resistant fiberglass or using solar energy, each choice contributes to a singular goal: finding long-term, cost-effective solutions that protect the environment.