

Grinder Pumps in a Low-Pressure Sewer System

By Sharon Zalewski, Environment One Corporation

A Tennessee community review shows increasingly positive operation and maintenance statistics.

Fairfield Glade Community Club has enjoyed great success with its low-pressure sewer system. When the development was being planned in the early 1970s, one concern was the ongoing costs of the operation and maintenance (O&M) of a pressure sewer system that would eventually involve thousands of grinder pumps. Today, almost 40 years since breaking ground, Fairfield Glade reports lower than expected O&M costs and an average of 7 years between service calls on its pumps.

Environmental and Economical Solution

Fairfield Glade is located on the Cumberland Plateau near Crossville, Tenn. This privately developed resort and retirement community contains 11 lakes, five golf courses and elevations ranging from 1,665 to 2,200 feet. Forested with rock outcrops prior to development, it had all the makings of a problematic site—elevation variations, waterfront and rocky soil.

Today, 12,000 residents in 4,500 houses call Fairfield Glade home. The community uses gravity and low-pressure sewer systems (LPS), with low-pressure systems being the preferred method.

The low-pressure sewer system is an environmentally sensitive and economically sensible solution. A grinder pump is installed into the ground at each home, with an access lid for service. The pumps grind the waste into a fine slurry and pump it under pressure into pipes that lead uphill or horizontally to an existing sewer main. Because of the pressure generated by the pumps, they are able to lift sewage 185 feet vertically or up to two miles horizontally.

Fairfield Glade has sole responsibility and oversight of the comprehensive sewer system. The operators have experienced reasonably low O&M costs, even as the system ages.

As some of the older pumps needed to be replaced, Fairfield Glade experimented for a short time with centrifugal grinder pumps that were expected to perform as well as the originally installed grinder pumps. The operators soon discovered that these were no more reliable and returned to the original pumps.

“It only made sense to stay with what worked,” said Bruce Evans, sewer system superintendent for Fairfield Glade.

“Using two brands of pumps meant we had to have two brands of inventory. We know [the originally installed] pumps work for our system. We have more pumps in the ground, and our costs are going down,” Evans said.

The 4,500-pump system averages 7 years average of mean



A grinder pump with an access lid for service is installed into the ground at each home.

time between service calls with a cost of only \$54 per pump, per year. Based on spending so far in 2012, Fairfield Glade projects to spend \$245,000 for panels, pumps and tanks.

"We're sticking to budget, and that makes the board happy," Evans said.

Repair or Replace

As the system nears the 40-year-old mark, many pumps in Fairfield Glade are coming to the end of their service lives and need replacement. Fairfield Glade has a "repair or replace" plan to determine if an old pump can be fixed economically or if it should be replaced.

"We just replaced a pump in 2011 that had been in the ground for 28 years and never had any service performed on it," Evans said. "When we get a service call, we usually pull out the pump and drop in a replacement [for convenience to the homeowner]. We rake the pump back to the shop and determine if that pump will be repaired or replaced. We have a spending limit for repairing pumps—a new pump under warranty is cheaper to own than a 25-year-old pump with no warranty."

Fairfield Glade owns the grinder pumps and alarm panels. Homeowners own the sewer lateral. They do not pay for pump replacement unless the problem was caused by the homeowner.

Fairfield Glade also repairs the pumps in house and tags new pumps with a service date. Should they get a service call, the technician can quickly determine if the pump is under warranty.

"We try to get the job done right the first time. We emphasize with our crew that quality is more important than quantity," said Ken Fore, sewer taps and grinder pump foreman. The 13-person crew includes five people dedicated to grinder pump service. The others are dedicated to lift stations and the treatment plant.

Author's Note: Wascon, Inc., of Livingston is the grinder pump distributor in Tennessee and provides training to Fairfield Glade.

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