

# PROBLEM SOLVERS

## Vacuum Sewers Help Clean Up Michigan Lakes

**Problem:** Wastewater pollution due to poorly maintained septic tanks.

**Solution:** A vacuum sewer system.

From the 1920s through the 1950s, the Multi-Lakes region 97 km (60 mi) west of Detroit was a popular destination for weekend getaways. During the second half of the 20th century, however, the region's quaint fishing villages became popular year-round homes for families who worked in Detroit, Lansing, or Ann Arbor but wanted a more rural lifestyle.

Unfortunately, as the region's population grew, so did its environmental problems. The original townships and villages didn't have wastewater disposal ordinances, so most cottages used septic tanks. Many of the septic systems were poorly maintained, so the local lakes, rivers, and groundwater were visibly polluted by 1990.

"We had instances where raw sewage was entering the lakes directly," said Maryann Noah, chairperson of the Multi-Lakes Sewer and Water Authority (Dexter, Mich.). "In some cases, the pollution was so bad that you could dig a hole and it would fill with sewage from the groundwater. I would describe the situation as very serious; it had reached a critical point."

In 1995, the Authority built Phase 1 of a new collection and treatment system, which served about 550 homes in the region. But wastewater contamination

continued to be a problem, and by 2000, Washtenaw County had passed a "point of sale" ordinance requiring homeowners to meet minimum wastewater treatment requirements before they could sell their homes.

In 2002, the Authority received permission to begin Phase 2 of its sewer project, which included about 200 homes in an area with relatively flat terrain and a high groundwater table. Trenching for traditional gravity-based sewers would be problematic here, so project engineers instead considered vacuum sewers and low-pressure sewers using individual grinder pump stations. They decided that vacuum sewers would be the most cost-effective choice because that choice was 10% better than grinders in initial capital costs, according to the Authority, and was 31% better than conventional gravity sewers.

At first, local public works officials were skeptical of this decision, so "the Jones & Henry [Toledo, Ohio] engineers took several of us on a field trip to Rochester, Indiana, to see the AIRVAC [Rochester, Ind.] demonstration facility," Noah said. "I was so impressed with the simplicity of the system. There are very few moving parts, which ultimately meant lower maintenance costs, and the vacuum pits that are located throughout the system don't require a power supply. This was important because a lot of the old cottages have substandard electrical sys-

tems. Once I saw the AIRVAC system in operation, I was sold."

The Authority approved the project team's recommendation, and the vacuum sewer system was constructed virtually without a hitch. "With a vacuum system, the trenches are relatively shallow. In this case, they averaged 1.2 to 1.8 m [4 to 6 ft] in depth," explained Bill Higgins at Douglas Higgins Inc., the project's general contractor. "That means we didn't have to tear up the neighborhoods. We got the project done on time and we actually came in under budget. And the first time we cranked it up, the system worked properly. It has been in the ground a year now, and I don't recall any complaints."

"AIRVAC's oversight of the project was extremely helpful," Noah said. "I insisted that we hire their field service rep to assist on our project, and it was definitely money well spent."

Local lakes and streams already are benefiting from the region's wastewater treatment efforts, Noah said. "The lakes are cleaning themselves up nicely," she said. "We did what we set out to do — protect the beautiful lakes and stream we have in this area. We'll hand our children a much better situation than we inherited."

For more information, access [www.airvac.com](http://www.airvac.com) on the Web or call Rich Naret, vice president at AIRVAC, at (813) 855-6297.

