

# Making Waves

**A New Jersey installer barges ahead to solve the challenge of replacing an aging septic system at a girls' camp on an island**

By Jim Kneiszel

There weren't any happy campers when the owners of an upstate New York Christian resort learned that the septic system on their Tapawingo Island girls' camp was failing in fall 2003.

Any system failure is bad news, but a failure on an island is double trouble: How do you replace the system on a postage-stamp property surrounded by water? Ask Joe Mayers, of Joe Mayers Excavating, a New Jersey-based onsite installer who specializes in serving customers in hard-to-reach resort locales, including small inland lake islands.

Since 2000, Mayers has developed a niche serving unique customers like the CAMP-of-the-WOODS resort on Lake Pleasant in the Adirondack Mountains region.

Using custom-built sectional barges and a fleet of compact rubber-tracked specialty equipment, Mayers adroitly maneuvers into challenging waterfront locations to replace systems other installers refuse to touch.

At the girls' camp, Mayers replaced an aging septic tank and gravel field with a pump-up gravity-feed system using a series of five 1,500-gallon septic tanks and an Eljen non-aggregate leachfield.

The system received permits from the state Environmental Conservation and Health departments and the Adirondack Park Association. The camp owners and designer Bobbi Trudel of Steven E. Smith Professional Engineers first planned to carry equipment, sand and supplies across lake ice to complete the project. Then engineers found that springs were weakening the ice.

Mayers trucked his equipment to the mainland camp in May, assembled a four-section 16- by 30-foot, 18-ton steel barge, mounted two 25 hp engines on the back, and floated the job materials 1.25 miles to the island.

## Site conditions

The 2-acre island consists of sand and an underlying rock ledge. Additional sand



**A technician installs holding spikes over a six-inch perforated pipe.**

## System Profile

<b>Location:</b>	Tapawingo Island in Lake Pleasant, town of Speculator, N.Y.
<b>Facility served:</b>	CAMP-of-the-WOODS Christian family resort
<b>Designer:</b>	Bobbi Trudel of Steven E. Smith Professional Engineers, Gloversville, N.Y.
<b>Installer:</b>	Joe Mayers of Joe Mayers Excavating LLC, Wantage, N.J.
<b>Site conditions:</b>	Wooded 2-acre sand and ledge island with gentle slope and several camp buildings
<b>Treatment type:</b>	Pump-up gravity-feed septic system
<b>Hydraulic capacity:</b>	3,200 gpd

was trucked out to the island when the first septic system was installed in the 1950s, and Mayers used that sand as fill.

The site has a three percent grade from the central high ground where the main buildings sit to the water's edge. The island's highest point is about 12 feet above the water level. The onsite system is located 35 feet from the water in an open area. The designer had to work around wooded areas, a dozen sleeping cabins and other buildings.

## System characteristics

The system is designed to handle an average of 3,200 gpd during two months of the summer, as determined by a metered municipal water system serving the island from an underwater pipe. The

water and sewer service are confined to the bathhouse with 16 sinks, eight showers and 13 toilets; the nurse quarters with a sink and toilet; and the kitchen with a sink and drain.

Three- and 4-inch existing drain lines from the buildings were spliced into a new 6-inch SDR-35 pipe that feeds by gravity into the new septic tanks. The buildings are about 30 feet apart, and the first septic tank is about 40 feet from the buildings.

Five 1,500-gallon plastic tanks manufactured by Rochester Rotational Molding are buried side-by-side in series with an inlet on one end and an outlet on the other. Effluent works its way through the system, making a U-turn from one tank to the next, with SIM/TECH brush filters at the 4-inch outlet baffles. The



**Employees Virgil Griffiths (left) and Bill Post transport a load of drainfield mats to the island.**

The first two tanks use dual brush filters, while the second two tanks have individual brush filters at the outlet. The fifth tank is the pump tank, which has two IIT Red Jacket pumps that move effluent at 75 gpm at 15 feet total dynamic head into the distribution system.

Atop each pump are two SIM/TECH pressure filters with pressure alarms. A pressure-activated switch sets off visible and audible alarms when the pressure

to limit environmental impact. The Biomats are lightweight and easy to transport, as were the plastic tanks.

## System maintenance

The camp asked Mayers to propose a maintenance schedule. He expects to pump the first two septic tanks in the series annually; tanks three and four every other year. As the system gets more use, a camp maintenance worker will check tank

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- Joe Mayers

reaches a pre-determined level to warn of accumulated debris in the filters. The float-triggered tank pumps alternate 400-gallon dosings to two larger drainfields and a mini-field created to work around an underground ledge.

The drainfield system consists of 144 Eljen Corp. In-Drain System two-stage Biomat units (3 by 4 feet and 8 inches thick) laid in a series of eleven 49-foot-long trenches and a series of four short trenches totaling another 49 feet. The trenches are two feet deep and four feet wide to allow for Eljen's specification of six inches of sand surrounding the bio-matresses that simulate gravel voids.

Effluent moves to two concrete distribution boxes and then into the drainfield through 6-inch perforated SDR-35 pipes secured to the filter bags with horseshoe spikes. A third distribution box is connected to one of the two main distribution boxes and runs to the four shorter drainfield lines.

The drainfields are covered with a fabric mesh and backfilled with sand. The tanks were covered with 18 inches of wood chips, and sod was laid over the leachfield for cold-weather insulation. A chain-link fence keeps campers away from the system.

## Installation

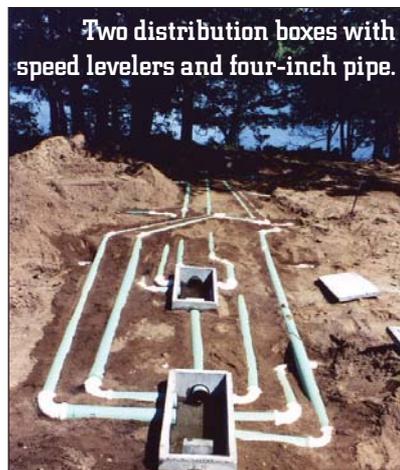
Aside from getting to the island, the biggest challenges to installation were reconfiguring the drainfield to work around shallow rock ledges and keeping the drainfield footprint as small as possible

levels every few days and the filters every three weeks, then send Mayers digital photos of the brush filters for examination. Mayers is suggesting the filters in the first two tanks be replaced every three weeks for redundant maintenance.

"It's worth every penny to change the filters frequently," says Mayers. "It's overkill for a normal system, but this system is out on an island, and to install it again is going to cost a lot of money. We're trying to protect against premature failure."

## System performance

It is too soon to characterize the system's long-term performance. Camp owners were happy that installation was done before the first campers arrived and with few trees removed. Flow is recorded daily and so far has peaked at 2,700 gallons, well below design capacity. ■



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