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# Building new homes and the high cost of infrastructure

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When Geranium Homes started planning Midhurst Valley, a multi-phase, approximately 5,000-home development currently under construction in Springwater, Ont., they were faced with a very expensive problem — no means of dealing with its wastewater-treatment needs.

## One of the biggest challenges in the new home building industry is the upfront cost of providing services such as waste water management

As Geranium was planning Midhurst Valley, a multi-phase, approximately 5,000-home development currently under construction in Springwater, Ont., they were faced with a very expensive problem.

“We’re effectively challenged to build a city there with no infrastructure,” said Vimal Patel, vice president of land development at Geranium. The development site, 570 acres of greenfield just outside Barrie, didn’t have access to the municipal sewage system, and a new, \$170-million wastewater plant was needed to support any future community.

However, the plant’s nine-figure price tag was far too steep for the developer to pay up front, and, without any home sales to justify the expense, securing financing from a lender wasn’t on the table.

The answer to Geranium’s problem lay in a few steel tanks measuring three metres long, two metres wide, and 1.5 metres deep — each scarcely bigger than a porta potty. These tanks house what are known as membrane bioreactors, or “self-contained little packaged plants,” as Joe Mullan, president and CEO of the Ainley Group, a planning and engineering consultancy, puts it.

The portable, stand-alone water-treatment devices can be hauled to a construction site by truck, connected to pipes, pumps, and electrical and put to work quickly, said Mullan. “They literally come pre-packaged and prepared,” added Mullan, whose planning and engineering firm was hired by the Township of Springwater to consult on the development, which is part of a broader Midhurst Secondary Plan for about 10,000 homes.

Seeing the potential of membrane bioreactors, known as MBRs for short, Geranium hired H2Flow Equipment Inc. to design ones that could be installed incrementally — and at a much lower cost than a full plant.

That way, they could gradually add wastewater-treatment capacity until enough homes were sold to support the construction of a much larger facility, which could take several years to construct.

In May 2024, two MBRs were installed on site — where they are currently serving the development's first phase of 342 homes — at a total cost of \$13.5 million for the entire system. Patel said the MBRs, which were manufactured by Fibracast Ltd., helped Geranium begin pre-construction sales — and get shovels into the ground sooner.

“We’re able to prove there’s a market there, and then we can use that to seek traditional financing,” he noted. He suggested that MBRs could do the same elsewhere, especially as homebuilders are increasingly encountering a lack of serviced land as they look farther outside the Greater Toronto Area for potential development sites. “Right now, one of the biggest challenges in the industry that has led to the cost of housing is the cost of infrastructure,” said Patel.

Each of Geranium’s MBRs has the capacity to treat daily wastewater from about 400 homes. The membranes work by sucking in wastewater through thousands of tiny tubes, which Mullan compares to spaghetti. Contaminants are caught in the tubes, and eventually sent off as waste. “It cleans the waste water almost to a drinking-water quality level,” said Mullan of the MBR system.

Water quality was of particular importance to the Midhurst site, which was subject to an environmental-assessment process that stretched on for more than a decade. Processed wastewater from the site is discharged into Willow Creek, flows through the ecologically sensitive Minesing Wetlands, and winds up in Georgian Bay.

“What the driving force is with these membranes is the environment,” said Mullan, who explained that after exiting the membranes the water also passes through a UV system that kills even more bacteria.

While the Midhurst site will require a full-scale plant, Geranium’s plan is to incorporate the on-site modules into the future facility. “The scalability was one of the benefits to it,” said Mullan.

“It would be very hard to build a small sewage plant that can accommodate 400 homes, and then two years later expand it to 800 homes, and then three years later expand it to 2,000 homes,” he said.

MBR technology isn’t new, noted Mullan, though its use at Midhurst Valley is novel. For more than 20 years, MBRs have been used to treat drinking water through a similar process. “They suck water out of the lake, they put it through these membranes, and then they take that clean water and send it out to the distribution system for people to drink,” Mullan explained.

More recently, MBRs have been incorporated into larger facilities as another step in the wastewater treatment process. “Most MBRs are used for a full-scale wastewater treatment,” said Sheng Chang, a professor of environmental engineering at the University of Guelph. Yet another advantage to MBRs in general, he added, is they require less labour to keep running, “Most of the operation has been automated,” he explained.

With a third membrane in the pipeline for Midhurst Valley’s second phase of 647 homes by the end of this year or early next, depending on need, Geranium is now considering a similar setup at another development, Patel suggested.

“It’s pushing the envelope,” he said. “There’s this whole notion that all developers have deep, deep pockets and can just fund \$200 million projects — and that’s not the case.”