

Maine Town & City

The magazine of the Maine Municipal Association

OCTOBER 2023 | VOLUME 85 | ISSUE 9



Innovative Wastewater Treatment

Improvements expected to foster
economic vitality in Windham.

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Innovation Infiltrates Wastewater Treatment

Windham voters approved a \$40.6 million wastewater treatment project, which will foster the community's economic wellbeing for years to come.

By Betty Adams

The \$40.6 million wastewater treatment project was approved by Windham voters 1,499-590 in June 2022.

The cost of the project is being financed through a combination of grants, funds from the American Rescue Plan Act, \$2 million from congressional earmarks, revenues from the tax increment financing district, and money from Cumberland County, as well as a loan from the Clean Water State Revolving Loan Fund.

"The way it's getting done is fantastic," said David Nadeau, vice chairman of the Town Council and chair of the Finance Committee. "And it's getting done not on the taxpayer."

The town is still applying for grants, and they anticipate more business once the infrastructure improvement is completed.

The project's goals are to protect the quality of North Windham Aquifer by addressing pollution concerns while supporting economic growth in the commercial area of the town. The plan involves connecting 101 businesses in that commercial area to the new wastewater treatment system.

"We are probably two to three months into construction by now," said Windham Town Manager Barry Tibbetts. "There's a temporary road in. The drip irrigation is installed where all the fields are going to go. They're now working on connecting all these pipes together." He estimated that the first flush of the new wastewater system would occur at the end of 2025 or the beginning of 2026.



Groundbreaking ceremony for the new North Windham Sewer Project. (Photo by Capt. Jason T. Burke)

When it's finished construction, the Membrane Bio-Reactor (MBR) treatment facility itself will look much different from the usual wastewater treatment plant with large circular tanks and vats. In fact, photos of ones similar to the treatment facility intended for Windham resemble a barn with a cupola atop. "You're not even going to know it's there," Tibbetts said, adding, "We do have some tanks under the building for the process-

ing and the ebb and flow of waste disposal."

At the groundbreaking ceremony in June, the Portland Water District issued a press release describing the benefits of the MBR treatment system:

- Smaller carbon footprint than standard treatment facilities;
- Most advanced micro-filtration system in the state for handling contaminants including PFAS (Per- and polyfluoroalkyl substances);
- Built-in redundancy to ensure reliability of service;
- Provides an odorless solution; (and)
- Allows for further growth and expansion.

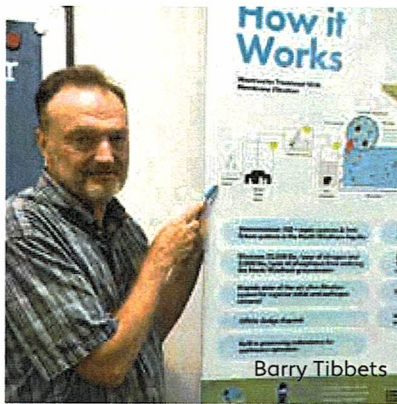
Town officials have worked to get a wastewater treatment system for decades, and in 2012 voters rejected a proposal to do a standard wastewater system that would have cost residents about \$100 million.

However, the problems with pollution – including the amounts of nitrogen and phosphorus being discharged into the aquifer – continued.

Then in 2020, Tibbetts was named town manager, and the Town Council told him to find a solution to the problem.

"I had some familiarity with sewer systems and technologies," said Tibbetts.

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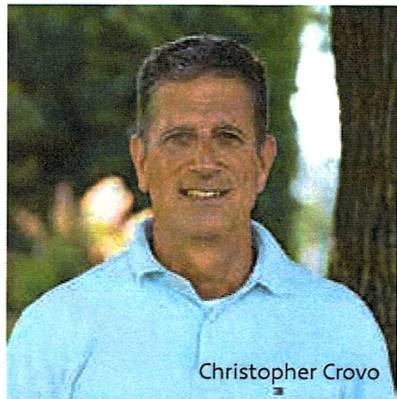
Barry Tibbetts



David Nadeau



Robert Burns



Christopher Crovo

He, Councilor Nadeau and Thomas Bartell, the town's economic development director, were among those who went to the New England Wastewater Treatment Convention in Boston where they saw the new technology and thought it might be applicable in the town. "We decided to partner with Portland Water District to see if we could do that system here," Tibbetts said.

Town officials also viewed similar technology in use at Martha's Vineyard and Sudbury, Massachusetts.

In 2021 the Windham Town Council signed an agreement with the Portland Water District "to design a reliable, technologically advanced wastewater treatment system that will improve and protect North Windham's water quality," according to a letter to residents which went out prior to the 2022 referendum.

Christopher Crovo, director of asset management and planning for the Portland Water District, said, "They approached us about solving the wastewater issue they had in North Windham, which was groundwater being contaminated by septic systems, specifically nitrates going into the ground. We partnered with them to build a treatment plant and hopefully intercept all those septic systems and bring them back to the treatment plant and treat it to almost drinking water quality, ground water quality – basically clean water going back into the ground as opposed to septic system water going into the ground."

The district already supplied water to Windham. "The Portland Water District, through the Maine Legislature,

has jurisdiction over us for water and sewer, so we partnered with them to do this project," Tibbetts noted.

Nadeau added that, because of rules created in the 1970s, "The permitting for the new technology through the Maine Department of Environmental Protection (DEP) was excruciatingly difficult." However, Tibbetts and Nadeau both praised Gregg Wood, Water Quality Management division director for the Maine DEP, for his work with the town.

Tighe & Bond did the initial engineering study for the town, and Brown and Caldwell did the design.

The project itself went to bid as a Construction Manager at Risk (CMAR) job, where the engineering firm and the contractor work together to guarantee a maximum price, and the contract was awarded to Brown and Caldwell, MWH Constructors, and Shaw Brothers.

"The CMAR requires active participation – two-to-three meetings per week," Tibbetts said. "There's a lot of details."

Tibbetts envisions "a real boost to the Town of Windham," which has about 19,000 year-round residents, resulting from the new wastewater treatment system, including new hotels, new housing, and growing businesses. Some of those developers and principals have already contacted town officials.

The press release from the Portland Water District about the groundbreaking notes: "North Windham's 302 Corridor is the gateway and service center for the Lakes Region. It is a bustling commercial district along the east shore of Sebago Lake, catering to tourists and surrounding small communities. Sebago Lake provides clean, safe drinking water to 11 communities in Greater Portland, 1/6 of Maine's population."

U.S. Sen. Angus King's press release noted, "This new wastewater facility will help the town modernize its infrastructure to attract new businesses and provide families with a high-quality of life– all while carefully preserving local ecosystems. I was proud to support funding for this project and look forward to watching Windham's growth for years to come."

"We have All Class A waters around Windham, so there was no place for us to put (the filtered water) but the ground," Crovo said. "It requires even a higher level of treatment, but we think it's the right thing to do."

The Portland Water District will be responsible for plant operation and for transporting the sludge to another of its treatment plants before it is taken to a landfill.

"We have four plants right now and this will be our fifth plant." Crovo said. "It will be our smallest plant starting out. It's designed to be expanded as needed. It's what we can afford at first, and as more customers come on, we can add more."

The system uses an initial influent screening process before moving to the bioreactor membrane and then the wastewater goes to the tanks for further clarification.

"It is going to be a technology you're going to see more and more throughout the state," he said.

The Portland Water District counts 11 communities within its territory, and six of those are wastewater also: Cape Elizabeth, Cumberland, Gorham, Portland, Westbrook, and Windham.

The local school district, Windham-Raymond Schools RSU 14, has a stake in the project as well. A later phase connects a planned new middle school – the subject of a referendum Nov. 7 – to the new treatment facility. That \$171.5 million project is expected to get \$131.7 million in state school construction funding.

Windham High School currently has its own wastewater treatment plant – which Tibbetts says is one of only two high schools east of the Mississippi River to do so – and the discharge from that plant goes into the Pleasant River (a Class B river) and then into the Upper Presumpscot River. That facility would be discontinued, and the school would be connected to the new treatment facility in the later phase.

The approximate \$6 million cost for some six miles of pipe and pumping station is not part of the initial \$40.6 million, and Tibbetts said applications for grants and other funding is underway to raise that.

He said that the Manchester Elementary School site is particularly suited to the drip dispersal system.

"The soils at this site here are exceptionally permeable here. You can put water on this and it will be gone in minutes," Tibbetts said. "We were permitted for 154,000 gallons per day and the site can easily take 600,000 gallons per day with no effect."

Tibbetts said hydrogeological studies show that the underground water flow from the site avoids local ponds.

"We know we can expand the system over time, so this is an ideal solution for those communities that are not on the ocean, communities that are inland that abut a lake or river – especially Class A. The only solution under the 1972 Clean Water and Air Act is it has to go into the ground," Tibbetts said. He says the state in 1985 adopted regulations more strict than the federal rules.

The end result of Windham's treatment facility will be filtrate or "near potable water" which will be dispersed into the ground. Tibbetts noted that with the new sys-

tem, instead of 22,000 pounds of nitrogen going into the ground, it will be closer to 220 pounds or 1%; the system also will remove 3,000 pounds of phosphorus annually from the North Windham Aquifer.

"I think we're on target and on budget," Tibbetts said. "We know we still have a couple years to go. Right now, we're all very, very optimistic."

The town also has another major project pending, this one to improve traffic, particularly around the major intersection of Routes 115, 35 and 302.

Windham worked with the Maine Department of Transportation to get funding – including federal dollars – to do the project. In an April 14 letter to U.S. Department of Transportation Secretary Pete Buttigieg supporting Windham's request for funds, U.S. Sen. Susan Collins wrote, "The project will also construct three local connector roads to improve accessibility to the region's commercial center and significantly reduce congestion and crashes on U.S. 302." In June, she announced that \$25 million was heading to Windham.

The town is also looking at relocating the town's fire station for faster response times.

"After all these decades of studies which fill a bookcase, we're able to take the best parts of those different studies and put them into a plan which will provide some real-life solutions for the residents of Windham and the visitors," Tibbetts said. "It's a huge win." 🏔️

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