

A modern MARVEL

High-tech drilling being
used to lay Lake Michigan
water pipeline

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WAUKESHA — If you've been driving anywhere around New Berlin, Waukesha, or even West Allis or Muskego, chances are you have witnessed the scope of Waukesha's Lake Michigan water project.

Since starting this past winter, construction crews from half a dozen firms have been laboring along with giant machinery to lay the many miles of pipeline required to bring Lake Michigan water to taps across Waukesha and send the treated wastewater back to the lake via the Root River.

On Thursday, The Freeman toured two of the project's roughly one dozen construction sites, getting a rare chance to witness some of the engineering feats and technology being put to use to effectively place and secure some of 36 miles worth of pipeline being installed as part of the \$286 million project, dubbed the Great Water Alliance.

New way to drill

To lay much of the pipe that will be going into the ground, contractors are and will be employing open trench construction, in which a trench matching the depth and length of a pipe segment is dug into the ground. In other areas, especially where there is heavy traffic or existing underground utilities, the water

By the numbers

14 — Total miles of water supply pipeline
2 — Miles of water supply pipeline installed thus far
22 — Total miles of return water pipeline
3 — Miles of return water pipeline installed thus far
550 — Feet of pipeline that gets installed each day

utility is using augur and horizontal directional drilling (HDD).

While augur drilling requires a trench box to be dug down to the depth of where an augur can tunnel into the earth, HDD allows a utility to tunnel into the ground from the surface at a horizontal angle. The technology is essentially steerable as it allows for the tunnel, and the pipes that will be pulled (rather than pushed) through it, to bend underneath existing utilities and then back up to a higher grade once past the obstructions.

If you notice a lot of hoses lying around on some of the construction sites, that's because technology uses a slurry — a combination of water and bentonite clay — to coat the walls of the tunnel and to help pull the pipes through.

'Discovery Channel stuff'

The Waukesha Water Utility's Great Water Alliance is using the technology in

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Jim Cobb, a construction manager with the Waukesha Water Utility's Great Water Alliance, shows Waukesha Mayor Shawn Reilly (left) the machine that is used to cut the giant plastic pipes that make up the Lake Michigan water supply line.



Jim Cobb points to sections of an augur that will be used to drill beneath 124th Street in West Allis.

Water project construction timeline

Dec. 1, 2020 — Construction starts on return pipeline

Jan. 11, 2021 — Construction starts on supply pipeline

April 29, 2021 — Roughly 20 percent of construction has been completed

Summer 2021 — Construction of Booster Pumping Station expected to begin.

May 2022 — Utility required to have 50 percent of entire project completed

September 2023 — Deadline for utility to have Lake Michigan water supply in place

More online: To see more photos of the project and a video explaining horizontal directional drilling, visit gmtoday.com.



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A Waukesha Water Utility employee observes as a contractor stands in a 19-foot-deep trench box on 124th Street near Oklahoma Avenue in West Allis. The trench box is being used as part of augur-drilling construction taking place at the site.

Pipeline

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many places to avoid disturbing things like high-pressure gas lines, Waukesha Water Utility General Manager Dan Duchniak said.

HDD is twice as expensive as open trench construction, but it's an essential technique in areas that require it, he said.

On National Avenue near South Acredale Road, where the utility is installing about 1,100 feet of the supply pipeline, HDD is being employed to bore a tunnel for the pipeline that will go under a creek located near the intersection.

"This is not for the faint of heart," said Jim Cobb, a construction manager for the Great Water Alliance, commenting on the scale of the project. "This is real stuff. This is Discovery Channel stuff."

The project

Construction of the pipeline, replete with two pumping stations and reservoirs, marks the culmination of 20 years of work for the city of Waukesha, which lobbied for years to find a safe alternative to its radium-plagued wells.

But there is still plenty of work ahead for the utility and its contractors. So far, the utility has completed about 20 percent of the entire project, which will take it through several communities.

About 2 miles of the 14-mile water supply pipeline, which will be constructed through West Allis, Greenfield, New Berlin and Waukesha, have been completed. And the utility has finished installing about 3 miles of the 22-mile return flow line, which begins at the Clean Water Plant in Waukesha and will head through New Berlin, Muskego, and Franklin.

The city is slated to have the entire water project completed by late 2023.