



**SAFETY IN THE STRAITS:**

# Line 5 Innovation and Technology

**The Straits of Mackinac is a special place, and that's why we take special precautions to continue the safe and reliable operation of Line 5 as it crosses under the Straits. We're harnessing, adapting, and advancing commercially available technology as one of several protective measures that we use to help keep the Straits safe.**

## **How are you using technology on the Line 5 Straits crossing?**

We've been working with Michigan Technological University's Great Lakes Research Center (GLRC) to capture advanced underwater sonar images of the Line 5 Straits crossing using an Autonomous Underwater Vehicle (AUV), and to support the deployment and operation of an environmental monitoring buoy.

## **How will this help boost safety?**

Data from both the AUV and the monitoring buoy, which is sponsored by Enbridge, will provide enhanced information to support an already robust pipeline inspection and maintenance program. The Line 5 Straits crossing is the most inspected segment of pipe in our entire North American network.

## **How often will this AUV be used?**

Supported by Michigan Tech, this technology is being tested on an investigative and developmental basis. Ideally, this technology will allow us to more efficiently collect information on the underwater topography near and around the pipelines, which will help to better inform our Line 5 pipeline maintenance program.

## **How does Michigan Tech's monitoring buoy promote general safety?**

By measuring wave height, wind speed and direction, air temperature, water temperature and currents in the Straits, this buoy will dramatically improve the accuracy of nautical weather forecasting in the region—and the ability to issue potentially life-saving public warnings.



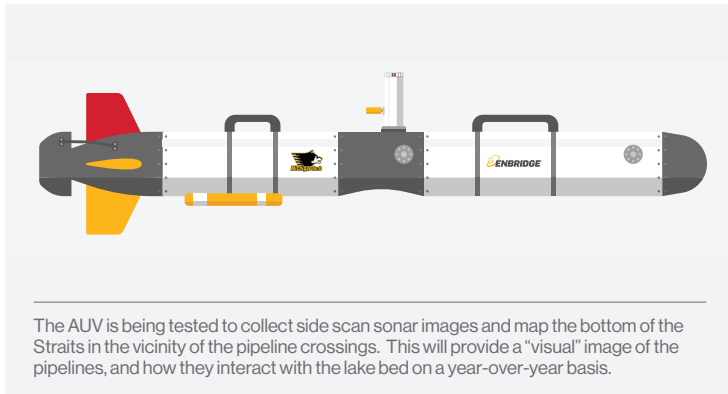
## Sonar mapping in the Straits

By testing and enhancing an AUV with Michigan Tech, we'll be gathering important data that gives us an enhanced understanding of how the twin pipelines at the Straits crossing interact with the lake bed on a year-over-year basis.

## Real-time data on water currents

We've also sponsored the operation and maintenance costs of a real-time environmental monitoring buoy, deployed in August 2015 by the GLRC in the Straits.

Equipped with acoustic Doppler technology, the buoy reports information on both surface and bottom currents in the Straits, in addition to a host of environmental conditions, for the benefit of everyone who uses the waterway. We expect to use information on currents, in tandem with AUV survey data, to keep the bottom of the Straits near Line 5 hazard-free.



## Keeping the Straits safe

Enbridge understands how important the Straits of Mackinac are to Michigan residents. The health and the protection of this waterway, and the Great Lakes, are essential to the vitality, sustainability, and economic prosperity of the region—and the state of Michigan.

That's why we've developed a suite of protective measures to help keep the Straits safe. One of our primary strategies is harnessing, adapting, and advancing commercially available technology in the interest of safety.

## What is Line 5?

Enbridge's Line 5 is a 645-mile, 30-inch-diameter pipeline that travels through Michigan's Upper and Lower Peninsulas, originating in Superior, Wisconsin, and terminating in Sarnia, Ontario, Canada.

Products moved on Line 5 heat homes and businesses, fuel vehicles, and power industry in the state of Michigan.

Built in 1953 by the Bechtel Corporation to meet extraordinary design and construction standards, the Line 5 Straits of Mackinac crossing remains in excellent condition, and has never experienced a leak in more than 60 years of operation. We're working hard to keep it that way.

