Slick Solution: How TRC’s Patented NAPL Trapping Cap System Restored a Michigan Waterway

When brothers-in-law Charles Myler and Stanley Daniloff discovered natural gas in North Muskegon, Mich., on December 8, 1927, it kicked off a Jazz Age oil boom along the shores of Lake Michigan.

Within a year Muskegon County had 70 drilling rigs running around the clock, producing both oil and natural gas. And more than 1,000 people were employed in the nascent industry – which later helped protect many families from the grips of the Great Depression.

While the days when Western Michigan looked more like West Texas are largely forgotten, there are some lasting legacies. Many of the 629 former wells in the area – one about every five acres – were crudely capped using an iron ball, tree stump or whatever else was easily available. Others were abandoned outright. The result has been an environmental impact that is still being felt.

Last year TRC helped the Michigan Department of Environmental Quality (MDEQ) take an important step in addressing the oil boom’s legacy, devising an ingenious way to stop the flow of oil into Fenner’s Ditch using a newly patented collection method for non-aqueous phase liquids (NAPL).

The project addressed a historic well that was leaking oil into Fenner’s Ditch, a short canal on the north side of Bear Lake that’s lined with homes and pleasure boats. Fenner’s Ditch had been plagued with oil sheens and slicks for decades, triggering environmental concerns and preventing residents and the public from fully enjoying the natural resources of the canal.

TRC’s role on the project began in 2015. Using a grant from the Great Lakes Restoration Initiative, MDEQ hired TRC to assess how to manage the historic well and prevent oil from contacting surface water. TRC also used direct-sensing investigation methods in the canal and on adjacent land as well as targeted soil and groundwater sampling to figure out the scope of oil contamination.

After determining the extent of the plume venting to the canal, TRC and MDEQ decided that the most feasible
and cost-effective approach was the construction of a NAPL Trapping Cap system to contain the crude oil.

**TRC’s patented approach to NAPL confinement in aquatic environments** is an innovative capping system with passive recovery that captures LNAPL moving upward due to buoyant forces and ebullition.

“NAPL migration and sheen generation are increasingly recognized as a widespread transport process at contaminated sediment sites that causes exposure to high levels of contaminants and failure of conventional sediment cap designs,” said John Rice, the creator of the system. “Certain contaminants can migrate into the water column from sediments and around or through traditional sediment caps, but TRC’s NAPL Trapping Cap represents a significant advance in controlling NAPLs and sheen generation.”

At Fenner’s Ditch, the system collects the seeping oil and prevents it from venting to sediment and surface water. The oil is contained until it naturally degrades or is removed and disposed via a vacuum truck. The passive system requires no pumps, so it boasts a low carbon footprint.

The cap was installed at the same elevation as the base of the canal, so boat access and recreational use of the canal are not affected.

Remedial construction began last June and included the removal and disposal of contaminated sediment prior to cap construction. The work was completed within five weeks.

The project was funded using a Pollution Removal Funding Authorization (PRFA) that was administered by the EPA and the U.S. Coast Guard using funds from the **Oil Spill Liability Trust Fund**.

Post-construction monitoring performed since the capping system was installed has shown it to be effective. The canal and shoreline has been restored and the Fenner’s Ditch community is able to enjoy this natural resource once again.

**Next Steps**

- To hear more about the Cap-and-Trap system at Fenner’s Ditch, join TRC’s Scott Pawlukiewicz at the 2019 No-Spills Conference in Traverse City, Mich. on January 30 or at the 2019 Battelle Sediments Conference in New Orleans on February 11.
- Learn how TRC can help you evaluate the migration of NAPLs and develop permanent and effective remediation solutions.
- Check out our corporate brochure to see how TRC has been a groundbreaking engineering, environmental consulting and construction management firm since the 1960s.
- Follow us on Twitter, LinkedIn and Facebook.
- Share your thoughts on this post or ask us a question in the comments section at the bottom of the page.
The oil slick in Fenner's Ditch prior to remediation.
Fenner's Ditch after TRC's restoration work was complete.

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