



The **Great Lakes Restoration Initiative**, or GLRI, is the largest investment in the Great Lakes in two decades. Sixteen federal departments or agencies are working together on five priorities:

- Cleaning up toxics and Areas of Concern (AOC).
- Combating invasive species.
- Protecting the lakes from polluted runoff.
- Restoring wetlands and other habitats.
- Raising public awareness, tracking progress and working with partners.

The GLRI's **Great Lakes Legacy Act** provides up to 65 percent of the cost of sediment cleanup with a non-federal entity contributing the balance. Legacy Act partnerships have cleaned up 21 sites in six Great Lakes states and remediated 4.1 million cubic yards of contaminated sediment.

Completed cleanups have transformed toxic hot spots into attractive locations and valuable waterfront assets.

Contact EPA

Heather Williams

Environmental Engineer
Great Lakes National Program Office
312-886-5993
williams.heather@epa.gov

Mark Loomis

Physical Scientist
Great Lakes National Program Office
312-886-0406
loomis.mark@epa.gov

Websites:

Muskegon Lake AOC
<https://www.epa.gov/great-lakes-aocs/about-muskegon-lake-aoc>

Zephyr Oil Legacy Act cleanup
<https://www.greatlakesmud.org/zephyr-site---muskegon-lake-aoc.html>

Agencies Complete \$16 Million Sediment Cleanup at Refinery Site

Former Zephyr Oil Refinery – Muskegon Lake AOC

Muskegon, Michigan

October 2018



Contaminated sediment is excavated from the former fire-suppression ditch at the Zephyr Refinery site. The refinery built the canal to bring water closer to the facility to fight frequent oil fires, but the fires allowed pollution to flow into the ditch and nearby wetlands.

U.S. Environmental Protection Agency in partnership with the Michigan Department of Environmental Quality is announcing the completion of a \$16 million Great Lakes Restoration Initiative sediment cleanup of the former Zephyr Oil Refinery in Muskegon Township, Mich. This action managed by EPA's Great Lakes National Program Office removed 50,000 cubic yards of contaminated sediment and brings the Muskegon Lake Area of Concern, or AOC, one step closer to delisting.

The U.S.-Canada [Great Lakes Water Quality Agreement](#) defines AOCs as designated geographic areas where beneficial uses like boating, fishing, wildlife habitat and drinking water have been harmed by pollution. When all the relevant beneficial uses have been restored to an AOC, then it is "delisted." EPA and other federal and state agencies are working with local entities to restore the 27 remaining U.S. AOCs in the Great Lakes basin, including Muskegon Lake. Four U.S. AOCs have been delisted.

The Zephyr site cleanup at 1222 Holton Road caps a successful five-year partnership between EPA and MDEQ. The federal and state environmental agencies worked under the Great Lakes Legacy Act sediment cleanup program to share the \$16 million cost of the project.

The Zephyr oil refinery has been a contaminated site in the heart of the Muskegon Lake Area of Concern. While there are still upland areas to be remediated on-site by the state, the GLLA cleanup is a significant step toward restoration of the AOC.

The Muskegon Lake AOC in western Michigan includes portions of the Muskegon River, Bear Lake and Muskegon Lake. The Zephyr cleanup is a sediment (mud) and wetland excavation, requiring the removal of refinery waste contaminated by high lead levels and petroleum products.

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Sediment is temporarily placed at the staging area for drying (dewatering) prior to transport to a landfill for off-site disposal.

One of the goals of the project was to restore wildlife habitat in the area. Now that contaminated material has been removed, restoration activities such as grading, seeding and planting are taking place.



Emergent marsh habitat restoration has begun on-site. Here workers drill holes to plant vegetation. This type of habitat can be found on the edges of streams and lakes and provides a home or food source for a variety of fish, frogs, snakes, turtles, birds and mammals.

AOC history

In the early 1900s, Muskegon County experienced a mini oil boom. The Zephyr Oil Refinery began production atop a bluff overlooking the Muskegon River, converting crude oil into gasoline and naphtha.

As the years went by, production switched to light oil and other products, ultimately focusing on bulk storage. The refinery consistently suffered pollution releases. Over its lifetime the company spilled over 700,000 gallons of oil from its bulk storage.

Also, during frequent oil-based fires at the facility, water mixed with oil, ash, and smoke returned to the wetlands areas.

Future plans

Other Great Lakes Legacy Act sediment remediation projects in the Muskegon Lake AOC have included a 2012 \$12 million cleanup at a location called the Division Street Outfall that removed 43,000 cubic yards of sediment contaminated with mercury and polycyclic aromatic hydrocarbons, or PAHs. Another 2006 \$14 million project removed 90,000 cubic yards of sediment contaminated with heavy metals, PAHs and PCBs from Ruddiman Creek.

Michigan DEQ is now working with the U. S. Army Corps of Engineers to clean up contamination in upland groundwater at the Zephyr site. That phase is scheduled to last until December 2019.



EPA and MDEQ worked with local governments, non-governmental organizations, residential neighbors and businesses to keep everyone informed and collect feedback on the Zephyr cleanup projects. Here local stakeholders belonging to the Zephyr Outreach Team tour the site.