

Pine River Progress

EPA's Update on the Velsicol Site St. Louis, Michigan



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Learn More About the Cleanup



www.epa.gov/superfund/velsicol-burnpit

www.epa.gov/superfund/velsicol-chemical-michigan



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A Year in Review: Significant Progress at the Velsicol Site

The U.S. Environmental Protection Agency, or EPA, is continuing cleanup at the Velsicol Chemical Plant Site in St. Louis. We've made significant progress with the multiple cleanup approaches for this site, as described below and on the following pages.

Pine River Downstream OU4 Ecological Studies 2024

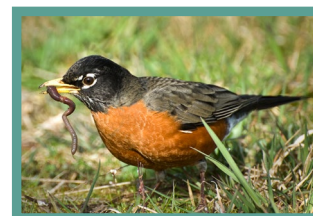
EPA conducted various ecological studies in 2024 in the Pine River Downstream Area Operable Unit 4, or OU4, boundary. Studies included a worm abundance study and American robin nesting, hatching and fledging study. EPA will use the results of the ecological studies performed in 2023 and 2024 to update the ecological risk assessment for OU4, select a cleanup option, and prepare a Record of Decision document that details the cleanup plan for this segment of the site. Keep reading for a deeper dive into these ecological studies:

Earthworm Abundance Study:

EPA scientists collected soil and earthworms during two field sampling events this year in three floodplains and analyzed for the pesticide DDT, to assess the relationship between the number of earthworms found and the amount of DDT in soil.

American robin nest surveys:

Scientists also studied robin nesting, hatching, and fledging patterns on three floodplains and the St. Louis Public Schools athletic field this summer. First, crews surveyed each property visually for the presence of American robin nests. Once they identified nests, they checked on the nest each day to record nesting success (presence of eggs), hatching success (number of eggs



hatched) and fledging success (number of birds that matured and left the nest).

Upstream Barrier Wall Repairs Design is Underway

EPA has completed two upgradient investigations (in 2019 and 2022) to evaluate the effectiveness of the current slurry wall. EPA presented investigation results and the evaluation of two components of the overall OU1 remedy in an Explanation of Significant Differences report, or ESD, finalized in September 2024. An ESD provides notice

of a modification to the selected remedy for a site that is part of the environmental cleanup plan. EPA has finalized the design of the upgradient slurry wall repair that incorporates changes stated in the ESD, and we anticipate that construction will begin in the spring of 2025. A copy of the ESD and final design report can be found on EPA's website (see QR code on page 7).

Velsicol Potential Source Area Excavation Complete

EPA completed both excavations at Potential Source Areas, or PSAs, 1 and 2, in December 2023, and restoration activities in May 2024. EPA accepted the Cleanup Report on September 30, 2024.

What Was Removed and Disposed?

The following materials were disposed of, reused, imported, or recycled:

Material Types	What happened to the Material?	Final Quantities
Topsoil	Reused onsite	8,098 Cubic Yards
Sand Cap	Reused onsite	2,651 Cubic Yards
Clay Cap	Reused onsite	36,040 Cubic Yards
Sand Fill	Imported clean material to the site to fill in excavation areas	147,200 Tons
Contaminated Soil	Disposed offsite	142,308 Tons
Toxic Substance Controls Act, or TSCA, Impacted Soil	Disposed offsite	171 Tons
Wastewater	Disposed offsite	509,519 Gallons
Railroad Ties	Disposed offsite	45 Tons
Recycled Steel	Recycled	256 Tons



What Was Achieved?

- We removed an additional 50,000 tons of contaminated soil than originally planned.
- We met cleanup levels, as confirmed through soil and water sampling and testing.
- Air monitoring demonstrated compliance with set standards for the duration of the project.
- We successfully removed soils contaminated with oily liquids. The removal significantly reduced the mass and movement of the underground oily liquids.



Before photo shows PSA-1 and PSA-2 in December 2023. After photo shows the same areas in October 2024.

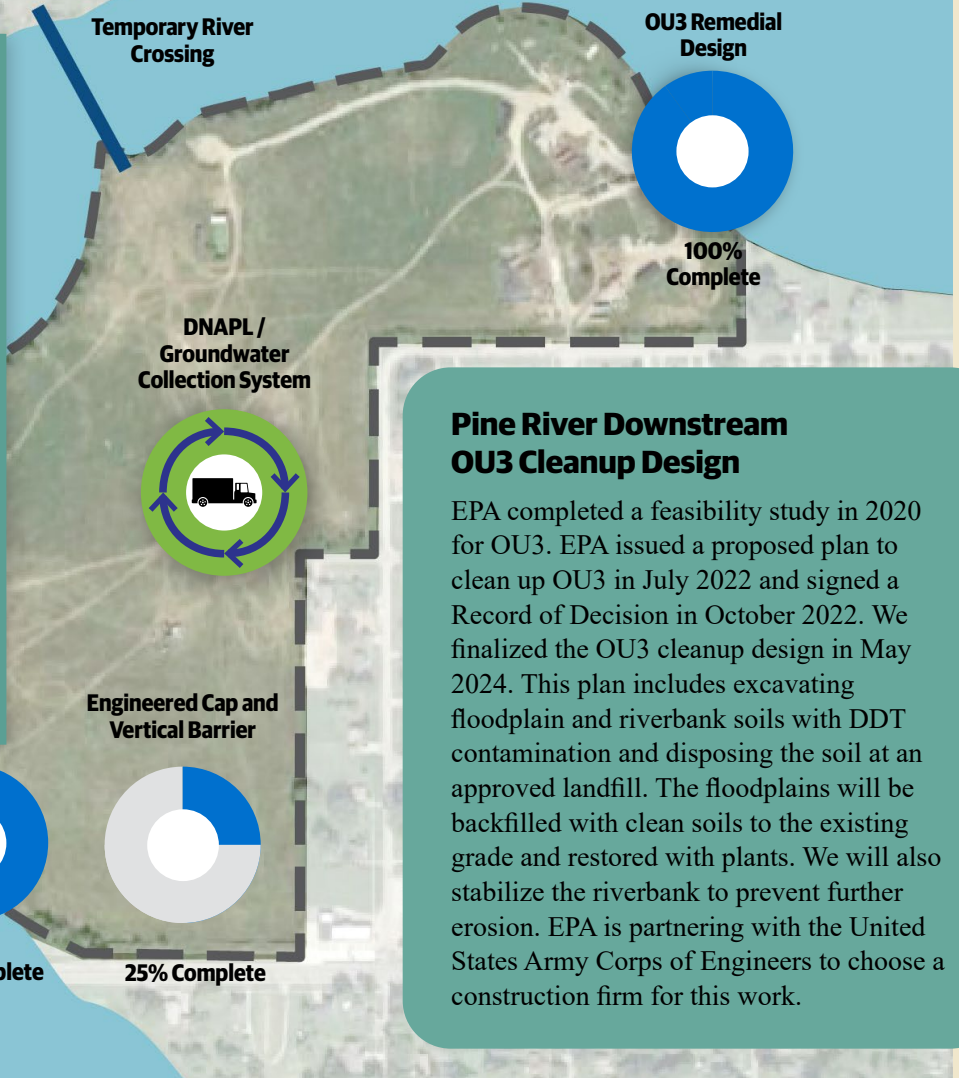


Velsicol Progress Tracker

Burn Pit In-situ Thermal Treatment (ISTT)



The cleanup includes multiple remediation approaches. The current status of each one is presented as follows.



OU3 Remedial Design



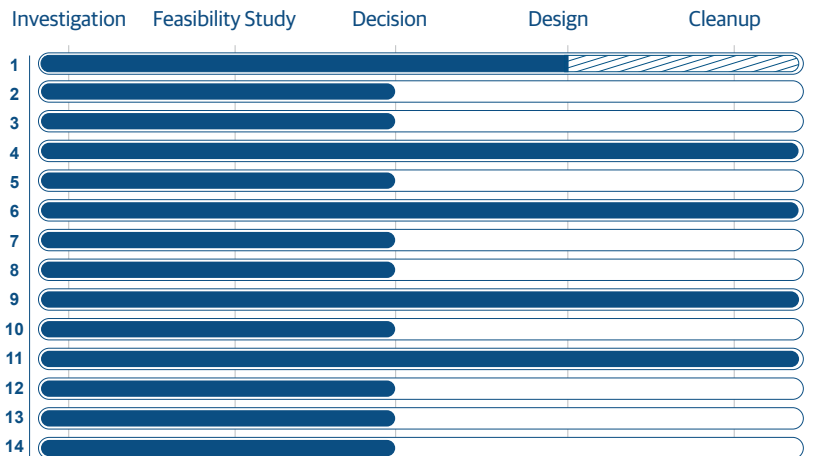
100% Complete

Pine River Downstream OU3 Cleanup Design

EPA completed a feasibility study in 2020 for OU3. EPA issued a proposed plan to clean up OU3 in July 2022 and signed a Record of Decision in October 2022. We finalized the OU3 cleanup design in May 2024. This plan includes excavating floodplain and riverbank soils with DDT contamination and disposing the soil at an approved landfill. The floodplains will be backfilled with clean soils to the existing grade and restored with plants. We will also stabilize the riverbank to prevent further erosion. EPA is partnering with the United States Army Corps of Engineers to choose a construction firm for this work.

Cleanup components of Operable Unit 1

- | | |
|---|--|
| 1. Vertical Barrier Wall | 8. Cap |
| 2. Perimeter Drain System | 9. Replacement of the City of St. Louis Municipal Water Supply |
| 3. Continue operation of existing dense nonaqueous phase liquid/ groundwater collection system (DNAPL/GWCS) | 10. Groundwater pump and treatment system |
| 4. ISTT application at Former Plant Site | 11. Adjacent and Nearby Properties |
| 5. DNAPL Recovery from Lower Outwash Unit | 12. Groundwater Monitoring Program |
| 6. PSA-1 and PSA-2 Excavation | 13. Site Restoration |
| 7. PSA-3 and PSA-4 Chemical oxidation | 14. Institutional Controls |



Project Spotlight

Burn Pit Heating Underway

In May 2024, EPA completed construction of the in-place thermal treatment system for the Velsicol Burn Pit Superfund Site. This work included installing the temporary bridge, extending the previously constructed high-voltage electrical circuit across the river, installing the electrical transformers and electrical distribution equipment, installing the thermal treatment system utility corridor, installing a temporary process pad north of the river, finishing the below-ground elements that will heat the soil and remove the contamination, constructing the water and vapor treatment systems, and installing the pressure and temperature sensor. The thermal treatment system began operating on May 15, 2024.

Like the previous thermal treatment systems constructed and operated at the former plant site, the Burn Pit uses in-place thermal treatment technology to heat the soil and groundwater in the treatment area underneath a 1.5-acre cement cap. This system heats the soil and groundwater to the target treatment temperature of 212 degrees Fahrenheit. Most of the contaminants present are dense oily liquids. As the soil and groundwater are heated, underground contamination separates into both vapors and contaminated groundwater, which are treated in the on-site treatment plant, and the dense oily liquids, known as DNAPL, which are sent off-site for disposal.

The system began to remove dense oily liquid contamination almost immediately after operations began. “We started to see significant contaminant removal in the first days of operation after we turned the system on. We are also removing more contamination as vapor than in previous phases and we will see more as heating

of the subsurface progresses” says Scott Pratt, an EPA contractor working on the project. Through October 21, 2024, the average treatment temperature was 203 degrees Fahrenheit and through that time the system has removed approximately 278,000 pounds of underground contaminants. The system will be run at target treatment temperature for at least 90 days and will be turned off after reaching performance goals established during the remedial design.

EPA provides the public with air monitoring data collected during the thermal treatment process for the Burn Pit in an interactive map. Visit www.epa.gov/superfund/velsicol-chemical-michigan and look for Sampling and Monitoring under Cleanup Activities.

Next Steps

During a cleanup, EPA can divide a site into several distinct areas, depending on the complexity of the cleanup action. These distinct areas are called operable units. The Record of Decision for the Velsicol Burn Pit divided the site into two operable units. The first operable unit (OU1) includes the area of dense oily liquids contamination now being cleaned up with the thermal treatment technology. The second operable unit, OU2, is for groundwater contamination. A cleanup investigation, feasibility study, proposed plan, and Record of Decision will be completed for OU2 and will follow the thermal treatment cleanup efforts for the Burn Pit Site. EPA has begun contracting efforts for this work now so that it is in place once cleanup activities associated with the thermal treatment are completed.

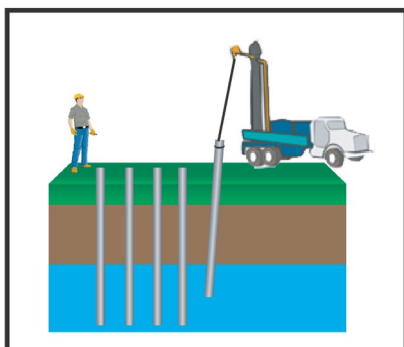


Burn Pit wellfield layout and corresponding thermal imaging of the wellfield during thermal treatment operations in October 2024.

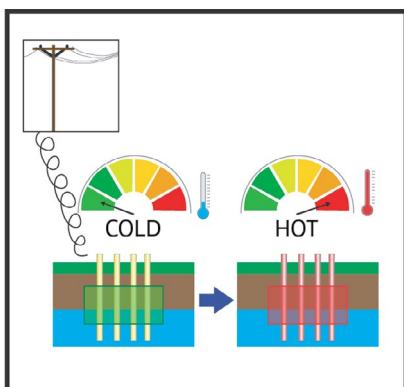


Thermal Treatment Technology

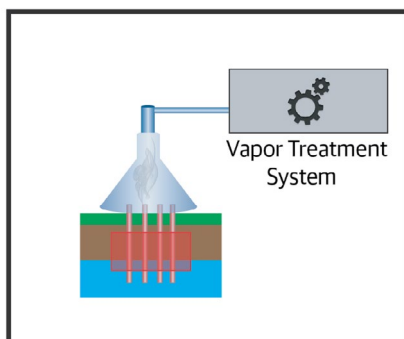
EPA has started up the in-place thermal treatment system that is actively cleaning up 1.5 acres of source area contamination at the Velsicol Burn Pit Site. The site received Bipartisan Infrastructure Law funding to implement the cleanup, which consists of heating the soil to remove contaminants (see below, “How Does it Work?”). Because EPA recently completed in-place thermal treatment at the former plant site across the river, the treatment system was already available and is currently being used for the Burn Pit Site cleanup. This reuse is possible with the addition of a temporary floating bridge in the Pine River connecting the Burn Pit and the former plant site treatment system. EPA anticipates the system will operate for approximately one year.



1. Heating equipment is placed in the ground.



2. Soil and groundwater are heated.



3. Contaminants are captured and treated or destroyed on-site.



How does it work?

The system heats soil and groundwater in the treatment zone to the target treatment temperature (212 degrees Fahrenheit) using electrical energy applied to heaters in the ground. Some of contaminants are vaporized into gases that are treated in the vapor treatment system. The heat makes the contaminants (dense oily liquids, or DNAPL) flow more easily through the soil for extraction and eventual off-site disposal.

Next Steps

Cleanup time depends on site conditions and chemical characteristics. EPA monitors the treatment system performance to record the amount of contamination removed over time. Once the system is removing only minimal amounts of contamination, EPA then looks at other information to make sure the system has performed as designed before it is shut down and removed. EPA believes that this technology will help remove contamination from these areas in a safe and effective way.

For More Information

For more information on in-place thermal treatment, visit EPA’s Technology Innovation and Fields Services Division Cleanup Information website: www.cluin.org/products/Thermal/.

Air Quality at the Velsicol Burn Pit

Residents may have noticed odors as the thermal treatment system operates at the Burn Pit site. While these smells are not harmful, EPA crews are actively working to eliminate these odors while also monitoring and sampling the air to make sure no emissions pose a health risk to nearby residents. For more information about EPA’s air monitoring process, scan the QR code to watch a [video highlighting](#) the same process used at the Velsicol former plant site.



Community Corner

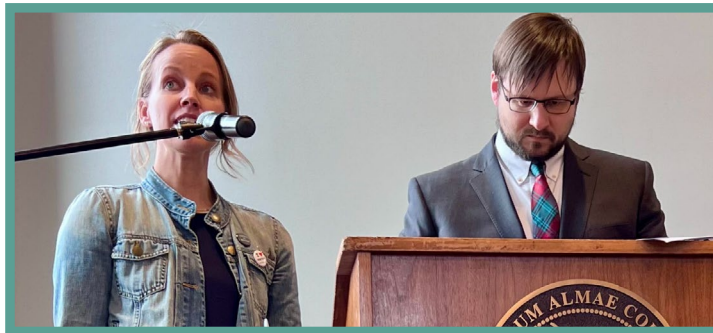
New Book and Digital Archive Now Available!

The book titled “The PBB Disaster at 50: Reflections, Critical Lessons, and a Path Forward” is an anthology commemorating the 50th anniversary of the PBB disaster in Michigan. Edited by Brittany B. Fremion from Central Michigan University and Benjamin L. Peterson from Alma College, the book includes a collection of essays, remarks, and images from community members, partners, and artists.

The PBB disaster occurred in 1973 when the Michigan Chemical Corporation accidentally shipped a flame retardant chemical, polybrominated biphenyl (PBB), to a livestock feed mill. This mix-up led to PBB entering the human food supply, affecting an estimated 8.5 million people in Michigan.

The book was developed after “The PBB Disaster at 50 Conference” and aims to serve as a community and educational resource, reflecting on the disaster’s impact and the critical lessons learned. It also includes contributions from various individuals involved in the aftermath and study of the disaster.

The anthology was released alongside a short film titled “[Unfinished Business: Michigan’s PBB Disaster 50 Years Later](#),” created by students from Central Michigan University, which explores the history and significance of the PBB disaster. The book and film were released during a special event at the Historic Wright Leppien Opera House in Alma, Michigan, on April 26, 2024.

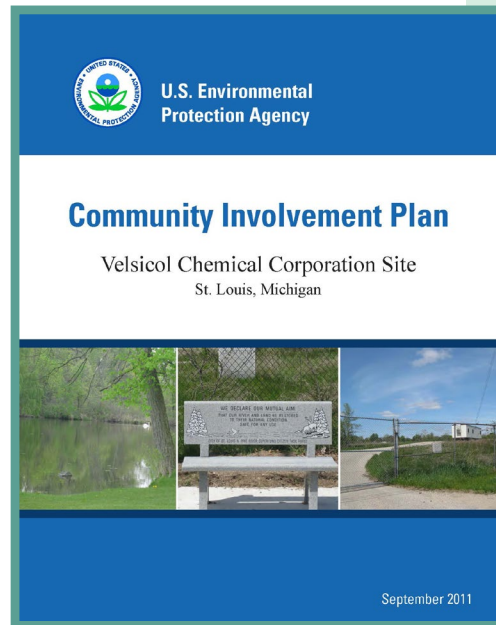


Brittany Fremion and Benjamin Peterson presenting at the PBB Disaster at 50 Book and Film Release Celebration in April 2024.

Community Involvement Plan Update Coming!

Come talk to the EPA about the site next spring. EPA will hold community engagement activities, including updating the Community Involvement Plan for the Velsicol sites. Site staff from the EPA would like to talk with St. Louis residents about upcoming work to clean up the Velsicol Chemical Corporation Superfund Site and the Velsicol Burn Pit Superfund Site.

During the conversation, we’ll ask questions to help us better understand and respond to your concerns. Interviews usually last about half an hour to one hour, and residents are welcome to come in pairs or a group. We’ll use the information we gather from interviews to update the site’s Community Involvement Plan, which gives us a road map to involve the community in meaningful ways throughout the Superfund cleanup process.



Community Involvement Plan for the Velsicol Chemical Corporation Site, September 2011.



[PBB Disaster at 50 Digital Archive](#)



Site Happenings

Monitoring Work in Action

EPA provides the public with air monitoring data collected during the thermal treatment process for the Burn Pit. Data are added to the interactive map during treatment to keep the public informed about operation of the system.

Visit www.epa.gov/superfund/velsicol-chemical-michigan and look for Sampling and Monitoring under Cleanup Activities.

Velsicol Chemical Corp. and Velsicol Burn Pit Superfund Sites, St. Louis, Michigan Contact Us

Site Map Thermal Conduction Heating Charts (Burn Pit) **Air Monitoring Charts (Burn Pit)** Historical Aerial Comparison

Air Monitoring Results Velsicol Burn Pit

Select Sample Locations

All	AA-01	AA-02	AA-03
AA-04	AA-05	AA-06	
AA-07	AA-08	AA-10	
AA-11			

Air Monitoring - Select a Day Range

All **Last 30 Days** Last 7 Days

Select a date or multiple dates

All	2024-05-13	2024-05-14
2024-05-15	2024-05-16	
2024-05-17	2024-05-18	

Air Monitoring Information

EPA's air monitoring system ensures that as treatment progresses, the air is safe for workers and the community.

How does the system work? EPA monitors the thermal treatment zone with a combination of handheld, real-time air monitoring devices and ambient air sampling technologies. We collect air samples using specialized containers called SUMMA canisters. We have placed these canisters at a network of strategically-placed monitoring stations in and around the site, as shown on this map. During construction (July – November 2023) of the ISTT wellfield there are 4 locations, 3 downwind and 1 upwind, around the daily drilling activities. During ISTT system operations (starts March 2024), there are eleven static air monitoring stations.

EPA then sends the air samples to a lab, which analyzes them using sensitive equipment capable of detecting very low levels of contamination. After this analysis, we compare the data to Project Action Levels (PALs), which are the specific concentrations in air that are safe for a person to breath 24 hours a day, every day, for the entire duration of the project.

EPA closely monitors the concentrations of contaminants in the air to ensure that they stay below the PALs.

Source: Esri, Maxar, Earthstar Geographic, IGN, and the GIS User Community (U.S. Environmental Protection Agency, Region 5, Superfund and ERM). Powered by Esri.

Sampling and monitoring data interactive map showing air monitoring results for the Burn Pit thermal treatment operations.

Site tours

EPA hosted eight public site tours in 2024. Site tours will continue to be available to the public throughout 2025.



Where to find more information:



Velsicol websites:



www.epa.gov/superfund/velsicol-chemical-michigan



www.epa.gov/superfund/velsicol-burnpit



To sign up for the Velsicol email list and receive news and updates about the site, send a blank email to velsicol@lists.epa.gov.



Did you know EPA has a facebook page? Follow EPA Region 5 on Facebook today! Go to www.facebook.com/epagreatlakes/

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Scan the QR code for up-to-date videos from the Velsicol Burn Pit project team.



About this Publication

Pine River Progress is a biannual newsletter that covers topics related to EPA's cleanup of the Velsicol Superfund Site. We welcome feedback and ideas for future articles. If you would like to receive a copy of this newsletter, please contact EPA Community Involvement Coordinator, Diane Russell at russell.diane@epa.gov or call 989-395-3493 9:30 a.m. to 5:30 p.m., weekdays.



Thermal imaging at the Burn Pit during operations. See page 4 for more information.