

Portsmouth, Fernald, Mound

Background

Ohio has three major U.S. Department of Energy (DOE) sites: Portsmouth, Fernald and Mound. Both Fernald and Mound successfully closed and transitioned to the DOE Office of Legacy Management (DOE LM) in 2006 as a result of the Accelerated Cleanup Program.

Portsmouth, also known as the Portsmouth Gaseous Diffusion Plant, is a 3,700-acre site located in southern Ohio. The facility was used to enrich uranium for fuel and weapons until 2001. The process of enriching uranium creates a co-product, depleted uranium hexafluoride (DUF6), that needs to be converted to a more stable chemical that can be reused, stored or disposed of. Portsmouth currently operates a depleted uranium hexafluoride conversion facility, similar to the facility at Paducah, Kentucky. Large building complexes remain at the site and are undergoing deactivation and decommissioning as well as remediation of soil and ground water contamination.¹

Fernald, now named the Fernald Preserve, is a 1,050-acre site located in southwest Ohio. It is a former uranium foundry that produced high-quality uranium metals for the nuclear weapons complex. Following years of cleanup, DOE EM declared closure of the site in 2006.² Ongoing activities at the site include continuing groundwater remediation, surveillance and monitoring of the on-site disposal facility, institutional controls implementation and other aspects of the remedy. In 2008 Ohio settled litigation regarding natural resource damage that focuses primarily on contamination and lost use of a portion of the Great Miami Buried Valley Aquifer.³

Mound, a 306-acre site located in Miamisburg in southwestern Ohio, operated as an integrated research, development and production facility performing work in support of DOE's weapons and energy programs. DOE LM manages the site. Ongoing activities include groundwater remediation, groundwater monitoring and the implementation and monitoring of institutional controls (U.S. EPA defines institutional controls as non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination, protect the integrity of the environmental cleanup remedy, or both).⁴

Major Accomplishments

DOE EM has worked with Ohio to achieve the following outcomes:

- In 2015 at Portsmouth, DOE EM finalized records of decision for the Process Buildings and Complex Facilities Decontamination and Decommissioning Evaluation Project and the Site-Wide Waste Disposition Evaluation Project. These decisions selected demolition of existing structures and

¹ U.S. Department of Energy, Portsmouth/Paducah Project Office. (n.d.). Portsmouth. Retrieved from <https://www.energy.gov/pppo/portsmouth-site>.

² U.S. Department of Energy, Office of Legacy Management. (n.d.). Fernald Disclosure Project: About Fernald. Retrieved from <https://www.energy.gov/lm/fernal-d-preserve-ohio-site>.

³ Ground Water Consortium. (2013). Great Miami Buried Valley Aquifer information page. Retrieved from <http://gwconsortium.org/gmbva-information-page.php>.

⁴ U.S. Department of Energy, Office of Legacy Management. (n.d.). Mound, Miamisburg, Ohio [Fact Sheet]. Retrieved from <https://www.energy.gov/lm/mound-ohio-site>.

disposal of materials that met waste acceptance criteria in an on-site disposal facility. Construction of the first three cells of the on-site disposal facility was completed in 2021, with waste placement operations ongoing since 2022. The X-231-B Landfill Excavation was completed in 2022 for use as engineered fill at the On-Site Waste Disposal Facility. Structural demolition of the large X-326 uranium-enrichment Process Building was completed on June 10, 2022, with the overall X-326 Demolition project about 70% complete as of December 2022.⁵ In 2018, Ohio EPA's Director issued final findings and orders for the Comprehensive Environmental Response, Compensation, and Liability Act actions to restore natural resources supporting removal of landfills and plumes within the perimeter road;⁶

- Following remediation, DOE EM restored the Fernald site to native habitats, using the post-excavation topography to determine habitat type. The site is now a park focused on wildlife and managed by DOE LM. A visitor center opened in 2008.⁷ More than 4,500 acres have been protected, with conservation easements and simple fee acquisitions within the watersheds surrounding the site as part of the natural resources damage settlement;⁸ and
- Since the Mound site became available for transfer in 2011, more than half of the original 306 acres have been transferred to new ownership. Currently, the Mound site has 16 businesses operating on the property with nearly 390 employees.⁹ In 2014, DOE EM implemented an enhanced monitored natural attenuation field demonstration at Mound in an effort to transition the active groundwater pump-and-treat system to a more passive, monitored, natural attenuation remedy. The demonstration involved injections of edible oils to create in-place treatment zones. The demonstration was completed in August 2018 and on-going ground water monitoring indicates that concentrations of volatile organic compounds (VOCs) are decreasing, and the plume is not expanding. Based on the results of the enhanced attenuation field demonstration, DOE is scheduled to submit a Proposed Plan for Amendment of Operable Unit 1 Record of Decision in 2022. The proposed plan will address residual VOC contamination in Operable Unit 1 and Parcel 9. DOE's preferred alternative to address residual VOC contamination in ground water is enhanced attenuation with monitoring. The preferred alternative for vapor intrusion is preemptive measures or actions to mitigate exposure. Both alternatives include institutional controls.

Relationship to Other Sites in the Complex

- Portsmouth and Paducah, Kentucky are managed out of the Portsmouth Paducah Project Office (PPPO), located in Lexington, Kentucky;
- Portsmouth, Paducah, Kentucky and Oak Ridge, Tennessee, all had gaseous diffusion plants, and while Tennessee's buildings are demolished, Portsmouth is in process and Paducah is beginning to prepare for demolition; and
- Portsmouth, Paducah, Kentucky and Oak Ridge, Tennessee, also receive federally appropriated funding from the Uranium Enrichment Decontamination and Decommissioning Fund (UED&D) which was established in The Energy Policy Act of 1992.

⁵ U.S. Department of Energy, Portsmouth/Paducah Project Office. (n.d.). Portsmouth regulatory approach. Retrieved from <https://www.energy.gov/pppo/portsmouth-cleanup>.

⁶ U.S. Department of Energy, Portsmouth/Paducah Project Office. (n.d.). Ohio EPA director's final findings and orders for CERCLA actions to restore natural resources. Retrieved from <https://www.energy.gov/pppo/downloads/ohio-epa-director-s-final-findings-and-orders-cercla-actions-restore-natural>.

⁷ U.S. Department of Energy, Office of Legacy Management. (2014, July 10). *Fernald Preserve attracts 50,000 visitors*. Retrieved from <https://www.energy.gov/lm/ferald-serve-visitors-center>.

⁸ Ohio Environmental Protection Agency. (2018, June). *Fernald Natural Resource Trustees 2017 annual report to the public*. Retrieved from <https://epa.ohio.gov/static/Portals/30/FFS/docs/doe/ferald/2020NRTAnnualReportFINAL.pdf>.

⁹ D Bush, J. (2018, June 7). Mound Business Park grows to 16 tenants, more companies likely on the way. *Dayton Business Journal*. Retrieved from <https://www.bizjournals.com/dayton/news/2018/06/07/mound-business-park-grows-to-16-tenants-more.html>.