



U.S. DEPARTMENT OF  
**ENERGY**

Legacy  
Management



Fernald  
Preserve

# Community Meeting

October 17, 2017

9034

The U.S. Department of Energy (DOE) Office of Legacy Management's (LM) 14th annual community meeting on the Fernald Preserve was held October 17, 2017, at the Fernald Preserve Visitors Center. The 17 guests in attendance received a summary of the *2016 Site Environmental Report* and an update on site activities.



# Agenda

- **Safety and Health**
- ***Comprehensive Legacy Management and Institutional Controls Plan (LMICP)***
- ***2016 Site Environmental Report (SER)***
- **Site operations**
- **Public activities and nature**
- **Site projects**
- **Natural Resource Trusteeship**
- **Look ahead**



# Fernald Preserve

## U.S. Department of Energy Office of Legacy Management Mission



**To fulfill the Department's post-closure responsibilities and ensure the future protection of human health and the environment.**

9034.03 10/17

U.S. Department of Energy Office of Legacy Management's mission at the Fernald Preserve.



# Worker Safety and Health

## Occupational Safety and Health Administration Recordable Rates

Industry (Remediation Services)	DOE Complex	LM
1.4	0.9	0.51

### Fernald Preserve

Restricted Days	First Aid
0	0

**Safe Work Hours: 1,509,628**



9034.04 10/17

Safety records at the Fernald Preserve and in the nationwide LM program continue to surpass industry standards.



## Navarro Research and Engineering, Inc.

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### Manager/Projects Leads

- **Bill Hertel**
  - Site Manager
- **Karen Voisard**
  - Environmental Monitoring, Data Management and Reporting
- **John Homer**
  - Ecological Restoration
- **Ken Broberg**
  - Aquifer Restoration
- **Penny Borgman**
  - Interpretive Services

Fernald Preserve LM contractor, Navarro Research and Engineering Inc., site management and project leads.



## ***Comprehensive Legacy Management and Institutional Controls Plan***

### **LMICP**

- **The LMICP describes the requirements for the site's long-term care**
- **The LMICP is reviewed, revised, and submitted annually to the regulatory agencies**
- **The LMICP consists of two volumes:**
  - **Volume I details site management**
  - **Volume II is required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation process and is a legally-enforceable document**
- **<https://energy.gov/lm>**

9034.06 10/17

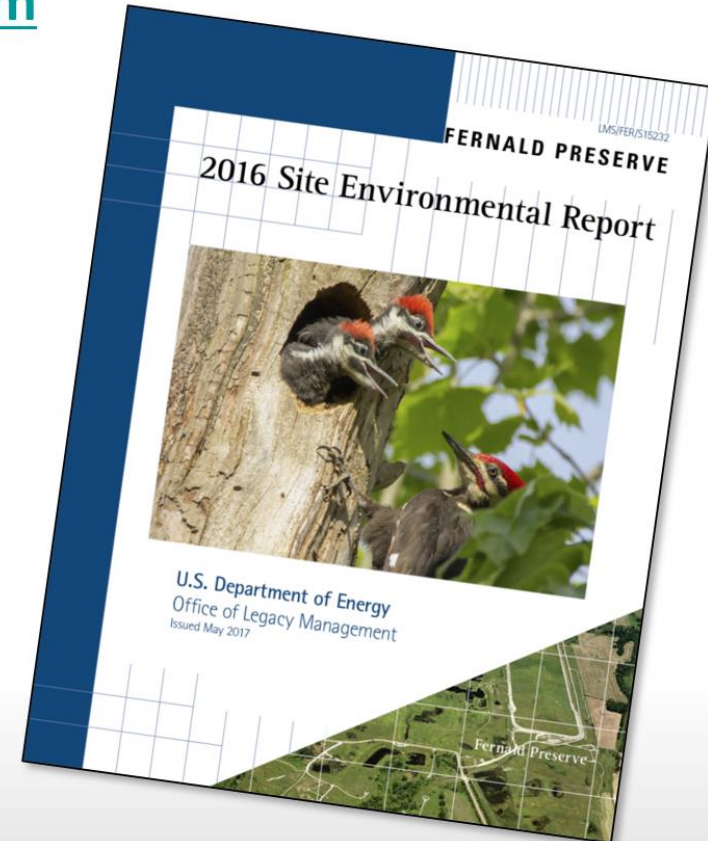
The *Comprehensive Legacy Management and Institutional Controls Plan* documents the requirements for Fernald Preserve's long-term care and is reviewed and updated yearly. The latest version is available on the LM website.



# 2016 Site Environmental Report

SER

- <https://energy.gov/lm>



9034.07 10/17

The *2016 Site Environmental Report* contains annual monitoring requirement results and is available on the LM website.



# Monitoring

2016

- **Surface water sampling at 21 locations**
- **Site effluent sampling at one location**
- **Direct radiation monitoring at 11 locations**
- **On-Site Disposal Facility leak-detection monitoring at 42 locations**
- **Groundwater sampling at 142 monitoring wells**
- **Water level monitoring at up to 174 monitoring wells**

9034.08 10/17

Routine environmental monitoring is conducted to ensure continued effectiveness of the site's cleanup. The 2016 monitoring regimen includes sampling groundwater, surface water, treated effluent, and direct radiation.





# Program Changes

2017

## Years of data supported changes

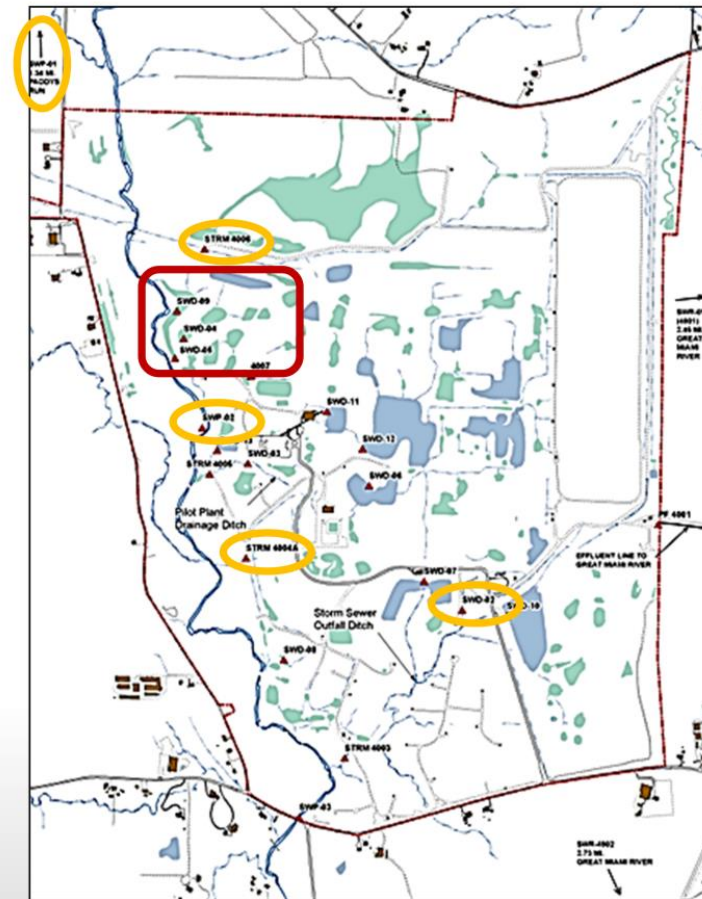
- **Surface water**
  - Eliminated sampling at 5 of 21 locations
  - Reduced constituents at an additional four locations
- **Sediment**
  - Eliminated (last sampled in 2014)
- **Direct radiation (dosimeter)**
  - Eliminated
- **Groundwater**
  - Eliminated sampling in 47 of the 142 monitoring wells
  - Reduced sampling frequency in additional 27 monitoring wells
- **On-Site Disposal Facility**
  - Reduced constituents
  - Reduced initial response leak detection accumulation rate



9034.09 10/17

Years of data were evaluated and support changes to the environmental monitoring program. The revised program is described in the 2017 *Comprehensive Legacy Management and Institutional Controls Plan*.

# Monitoring

## Surface Water and Site Effluent



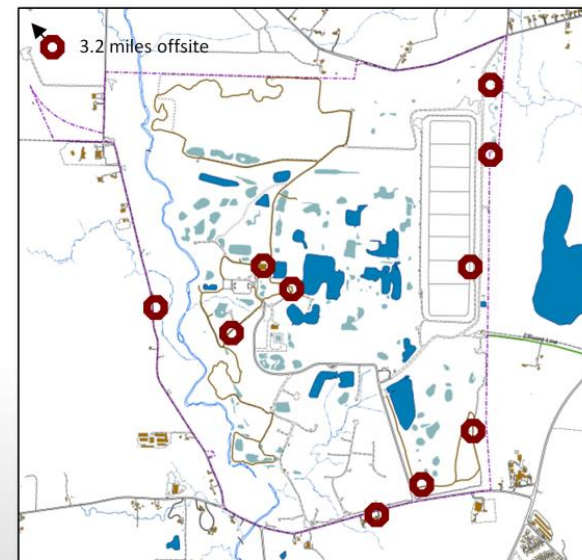
-  Stopped monitoring
-  SWD-05, SWD-09

Surface water continues to be monitored at numerous locations onsite and offsite.

# Monitoring

## Dosimetry

- On-property results were indistinguishable from off-property results
- Monitoring discontinued and dosimeters removed at the end of 2016



Dosimeter (direct radiation) monitoring results for 2016 are similar to historical results.



# Emerging Contaminant

## Perfluorinated Compounds

- U.S. Environmental Protection Agency (EPA) identified perfluorinated compounds as an “emerging contaminant” in the nation’s drinking water (Spring 2016)
- EPA requested evaluation during the 2016 CERCLA Five-Year Review process
  - Submitted groundwater sampling plan (December 31, 2016)
  - Submit investigation plan (March 31, 2018)
- On hold until EPA finalizes national sampling and analysis methods



9034.12 10/17

Perfluorinated compounds are emerging contaminants for the nation’s drinking water, per the U.S. Environmental Protection Agency, and will be evaluated to confirm their presence or absence. The compounds are associated with foam firefighting agents that were once used in small quantities onsite at the Fire Training Facility.



# Ecological Restoration

- **Restoration projects**
- **Restored-area maintenance**
- **Ecological monitoring**
- **Site inspections**
- **On-Site Disposal Facility inspections**



9034.13 10/17

Ecological restoration work includes maintenance, monitoring, and inspections.



# Ecological Restoration

## Restored-Area Maintenance

- Vegetation management
- Inspection follow-up



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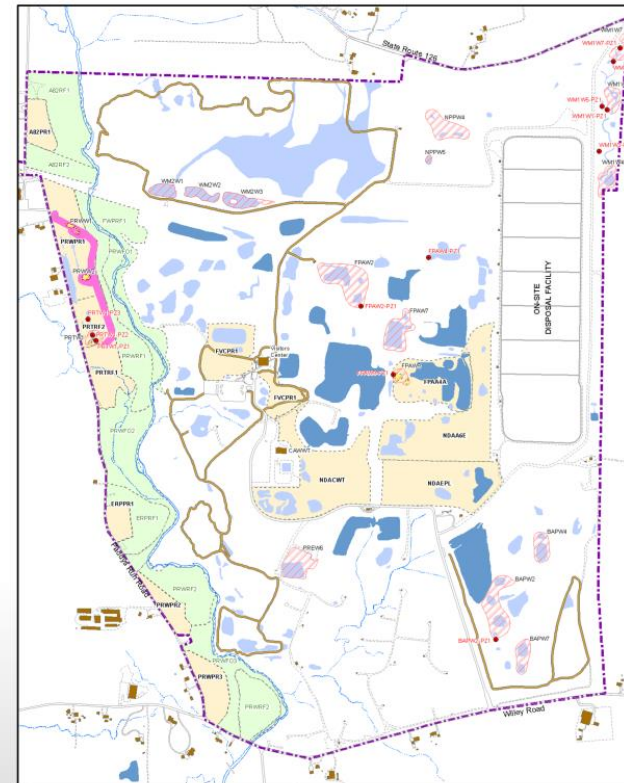
Restored area maintenance includes vegetation management and follow up from site inspections.



# Ecological Restoration

## Monitoring

- Wetland mitigation
- Functional
- Implementation
- OSDF vegetation cover



9034.15 10/17

Monitoring programs help site personnel evaluate the status of ecologically restored areas at the site.



# Ecological Restoration

## Inspections

- Site
- On-Site Disposal Facility
- Trails



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The inspection process continues in compliance with the Fernald Preserve *Comprehensive Legacy Management and Institutional Controls Plan*.





# Ecological Restoration

## Endangered Species and Cultural-Resources Surveys

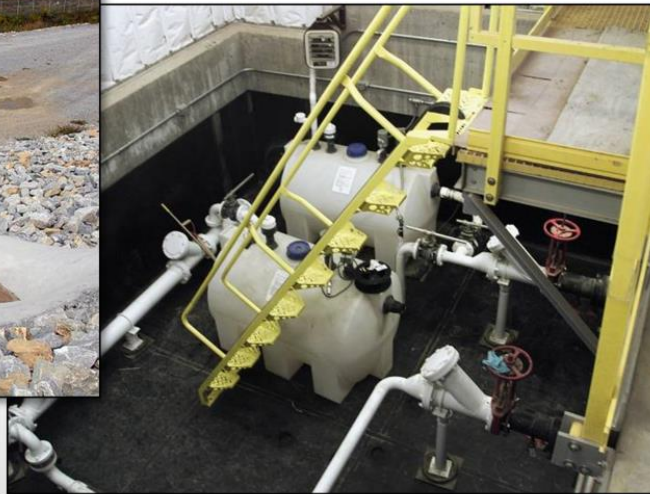
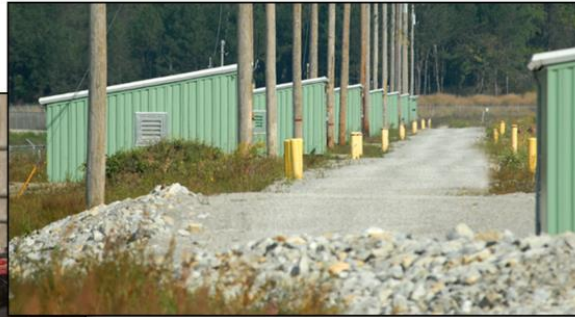


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Endangered species and cultural resource surveys are conducted prior to field activities.



# On-Site Disposal Facility



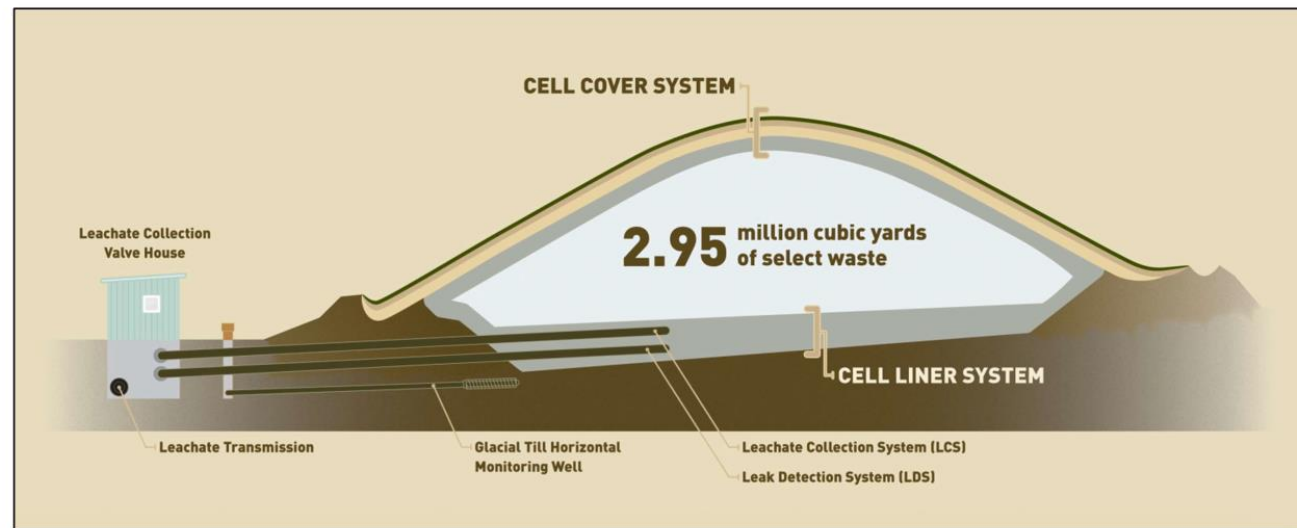
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The On-Site Disposal Facility is an engineered waste-storage area that holds 2.95 million cubic yards of waste that was generated as part of the site cleanup.



# On-Site Disposal Facility

## Leachate Collection System

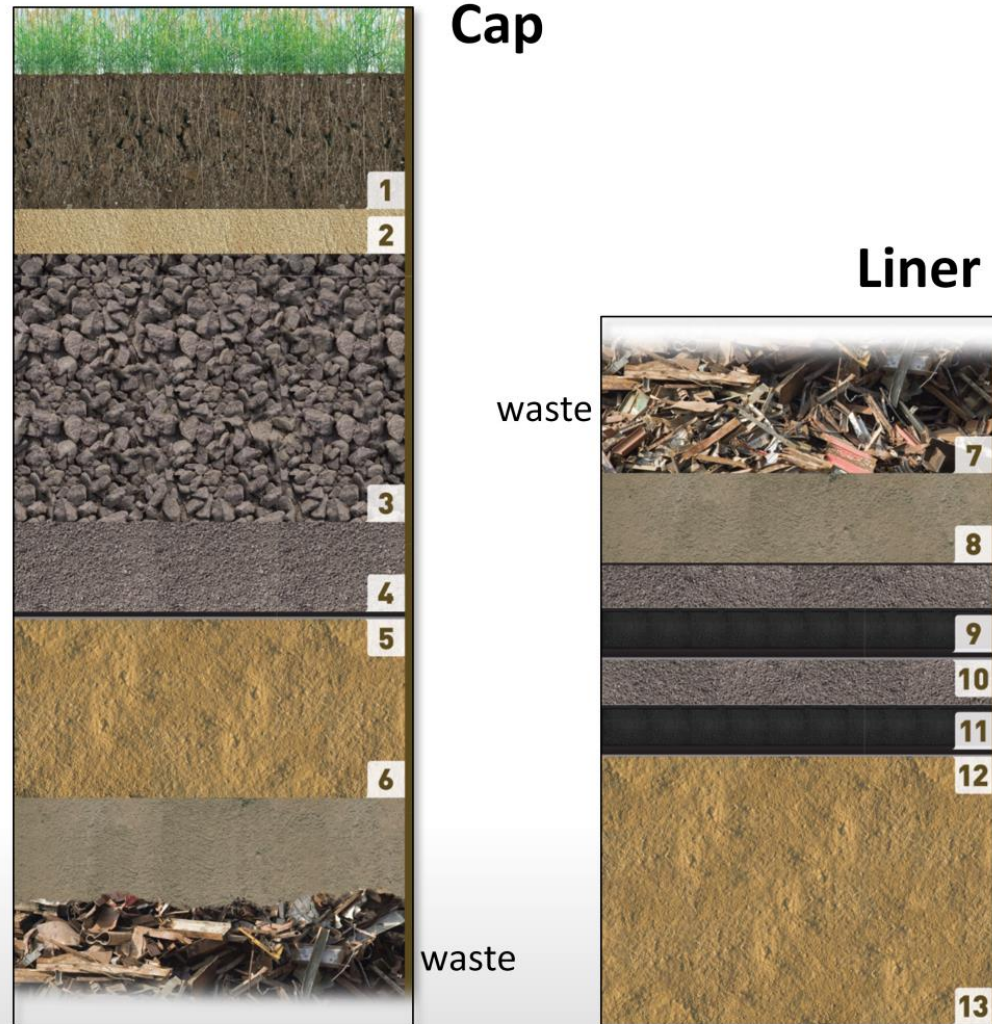


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The On-Site Disposal Facility was constructed with an engineered liner and cover system that serves to isolate the entombed waste from the environment.



# On-Site Disposal Facility

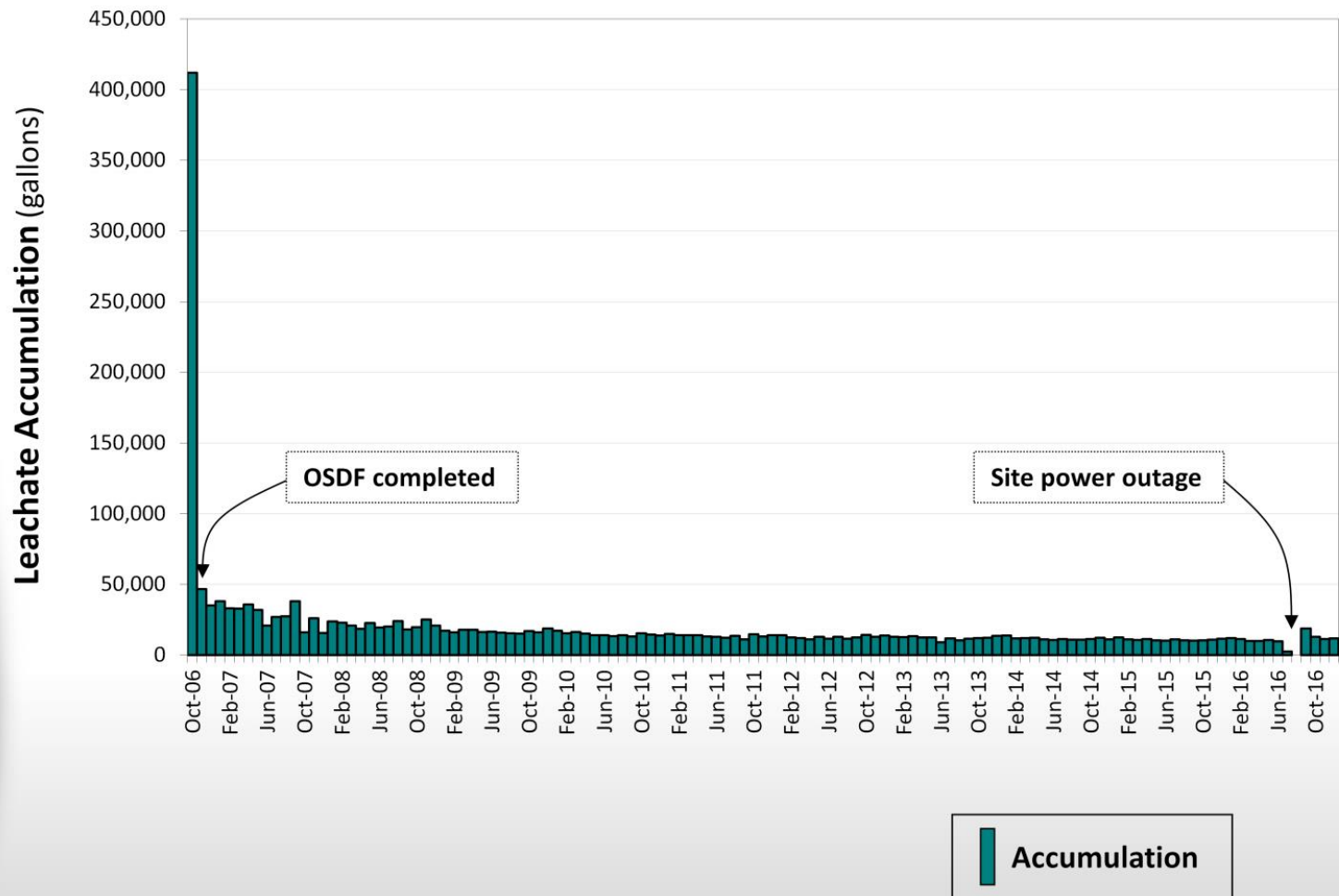


Waste is safely encapsulated between a 9-foot cap and a 6-foot liner within the On-Site Disposal Facility.



# On-Site Disposal Facility

## Leachate Collection System – Monthly Flow



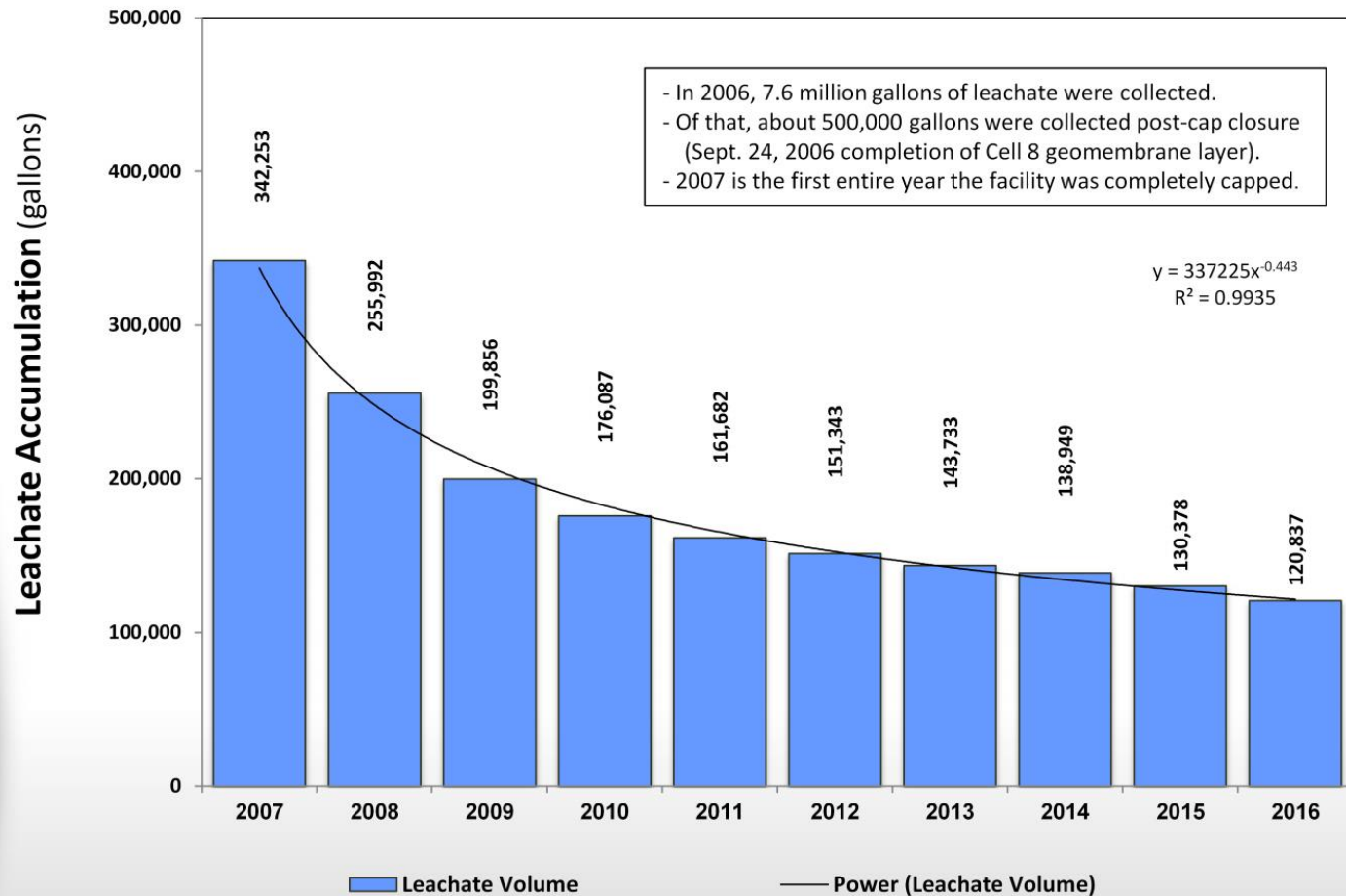
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Leachate is the moisture in the waste within the On-Site Disposal Facility and includes water sprayed on the waste to control dust and rainfall events prior to cell capping. The leachate is collected and transferred to a treatment facility. Before the cover system was completed in October 2006, hundreds of thousands of gallons of leachate flowed each month.



# On-Site Disposal Facility

## Leachate Collection System – Annual Flow



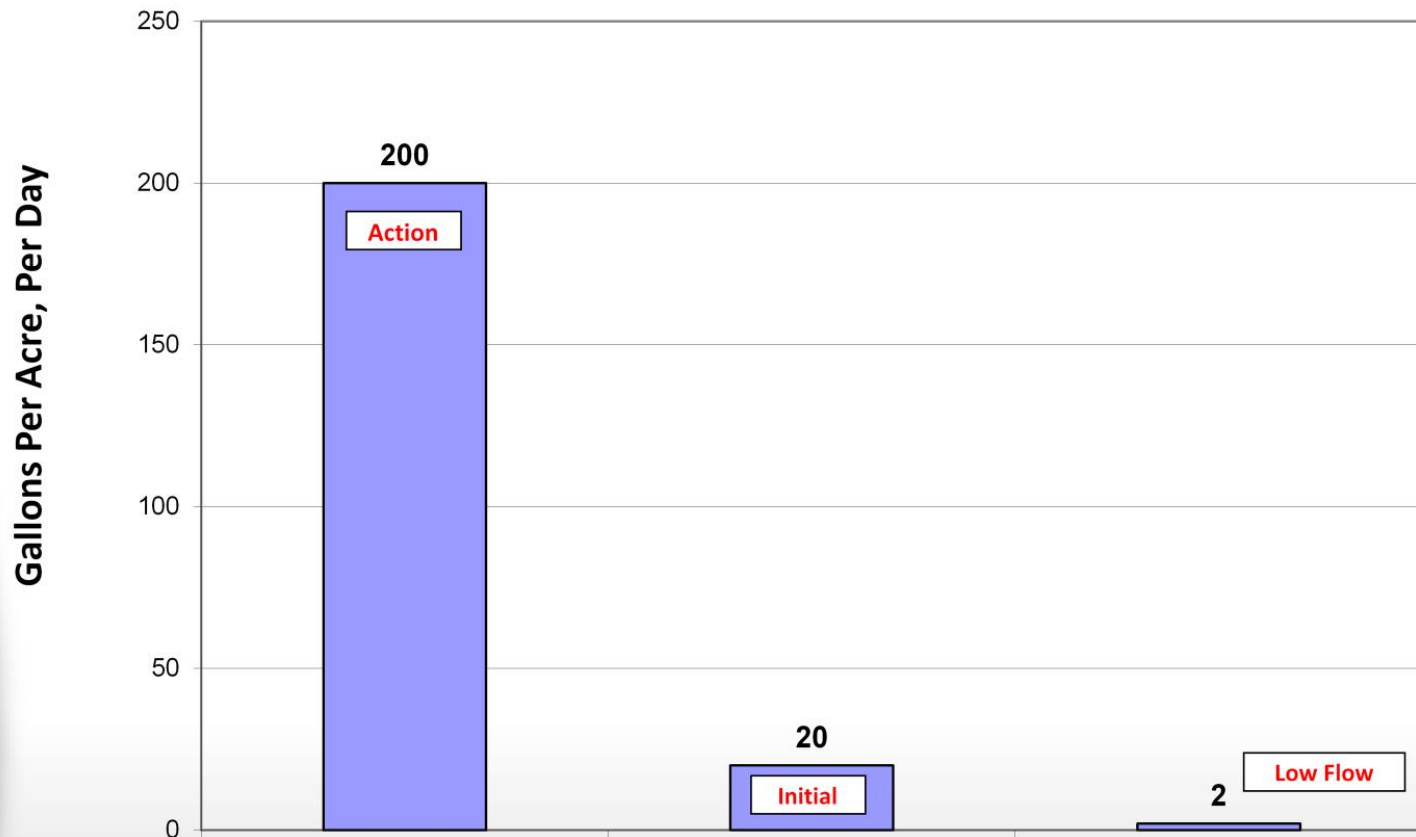
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Leachate is the moisture in the waste within the On-Site Disposal Facility. The leachate is collected and transferred to a treatment facility. Annual leachate flow continues to decline.



# On-Site Disposal Facility

## Leakage Detection System – Flow Rates



9034.23 10/17

By design, monitoring flow from the Leak Detection System is one of the main indicators of whether or not the facility is operating as designed.



# On-Site Disposal Facility

## Low Flow Response Leakage Rate Basis

Year	Cell	Maximum Accumulation Rate (gpad)	Maximum Flow Rate (gpd)
2008	5	1.36	8.70
2009	5	0.48	3.10
2010	6	0.21	1.30
2011	8	0.38	3.50
2012	6	0.10	0.64
2013	6	0.07	0.40
2014	6	0.06	0.40
2015	6	0.23	1.50
2016	6	0.18	1.20

Action leakage rate	200 gpad	1,300–1,900 gpd
Initial response leakage rate	20 gpad	130–190 gpd
Low response leakage rate	2 gpad	13–19 gpd

gpad: gallons per acre per day

gpd: gallons per day

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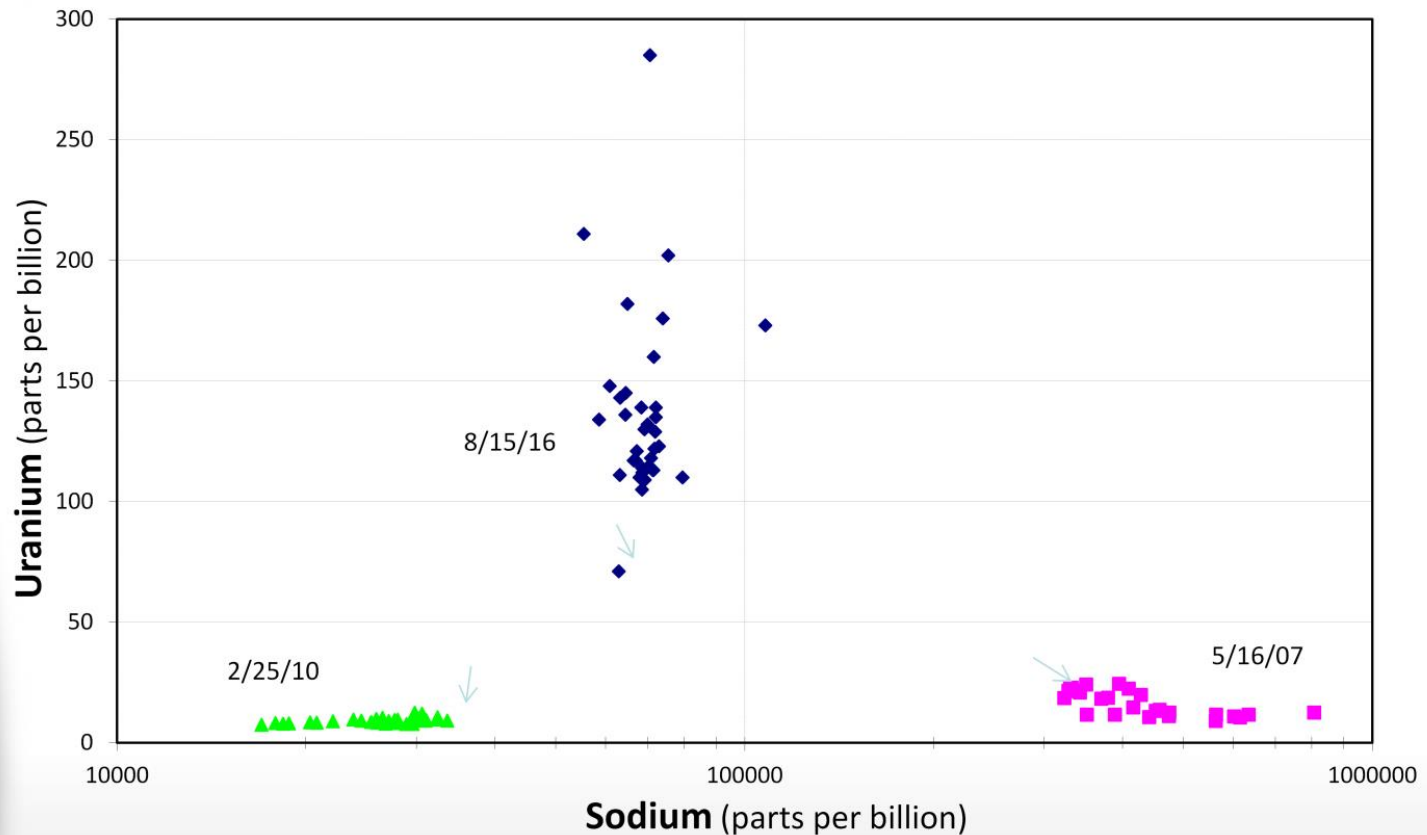
Leak Detection System accumulation rates in the disposal cells are so low that a new Low-Flow Response Leakage Rate of 2 gallons per acre per day has been defined. By comparison the Response Leakage Rate is 20 gallons per acre per day, and the Action Leakage Rate is 200 gallons per acre per day.





# On-Site Disposal Facility

## Uranium versus Sodium Concentrations: Cell 3 (Bivariate Plot)



◆ Leachate Collection System    ■ Leak Detection System    ▲ Horizontal Till Well

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A comparison of uranium concentrations and sodium concentrations in and below Cell 3 of the On-Site Disposal Facility is an example of a method used to demonstrate that the liner system is working as designed.



# On-Site Disposal Facility

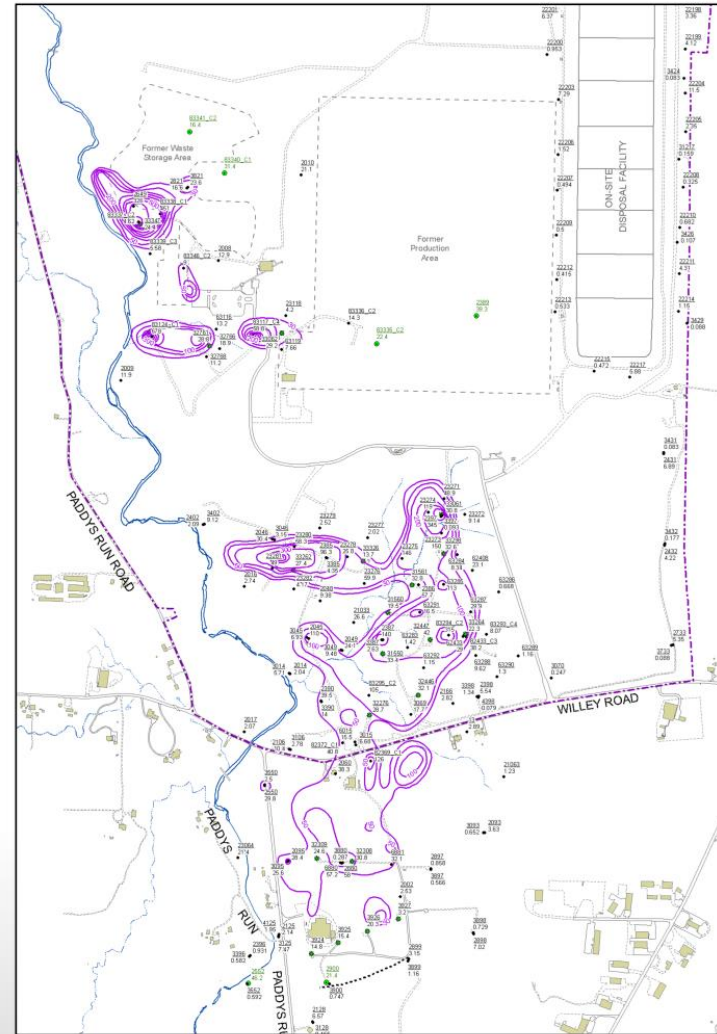
Performance: 2016

- No indication of leaks
- Highest recorded levels of Leak Detection System accumulation:
  - Cell 6: 0.18 gallon per acre per day (gpad)
  - Low flow response leakage rate: 2 gpad
  - Initial response leakage rate: 20 gpad
  - Action leakage rate: 200 gpad
- Leachate Collection System volumes have stabilized and continue to diminish indicating the cell cap is functioning as designed
- Leak Detection System accumulation rates indicate the liner systems are performing as designed
- Water quality trends in the horizontal till wells and Great Miami Aquifer wells indicate concentration fluctuations beneath the facility are not related to facility performance
- No visual signs of compromised cap integrity

On-Site Disposal Facility cap and liner systems are performing as designed.



# Aquifer Restoration



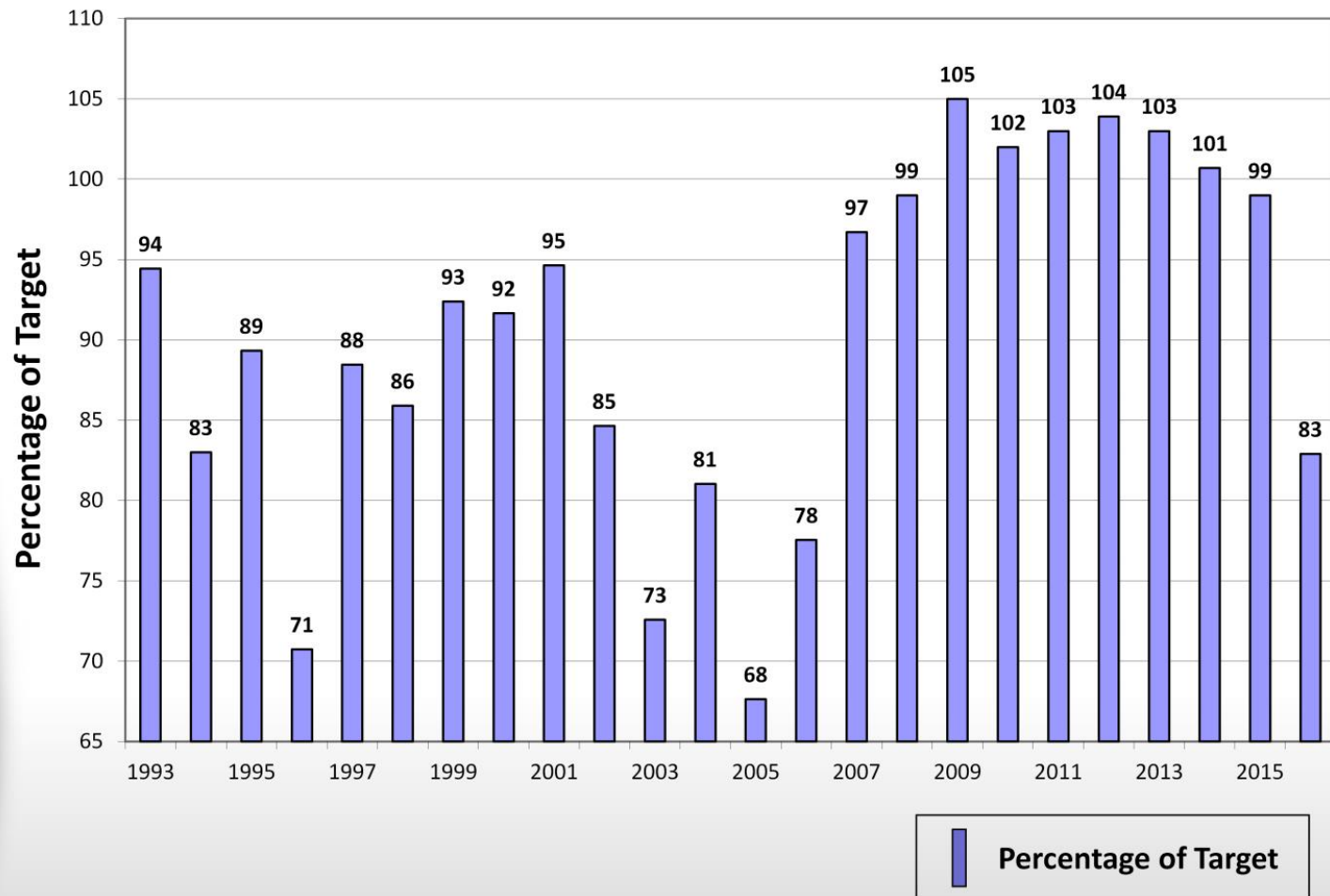
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Groundwater cleanup continues at the site.



# Aquifer Restoration

## Pumping: Percentage of Target Achieved



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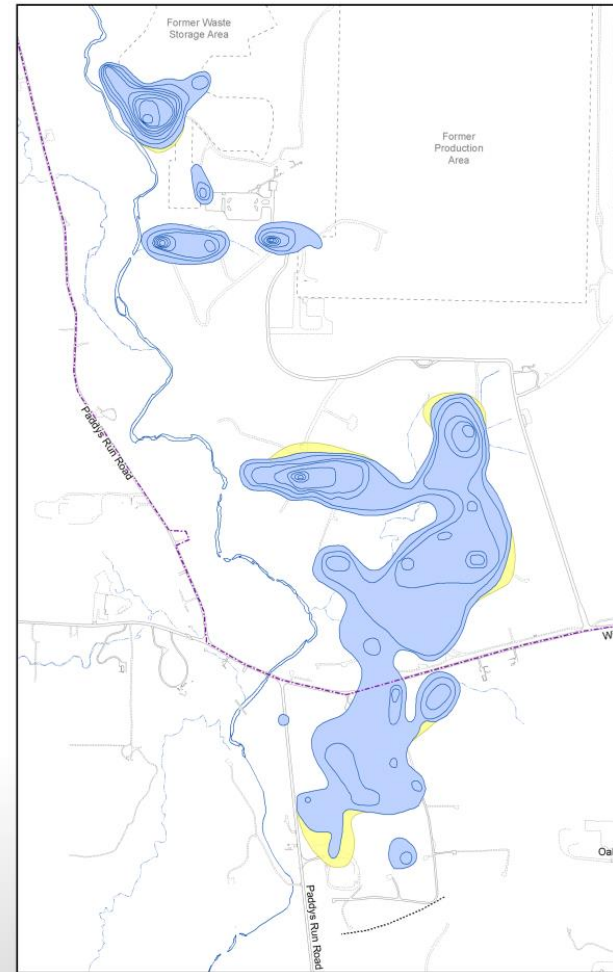
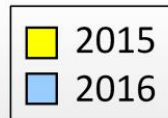
Since site closure in 2006, operations have achieved at least 97 percent of the planned annual target pumping rates, with the exception of 2016 when the site experienced an unplanned well field shutdown in the summer due to site electrical problems.



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# Aquifer Restoration

## Maximum Plume Acreage: 2015 and 2016



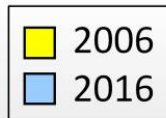
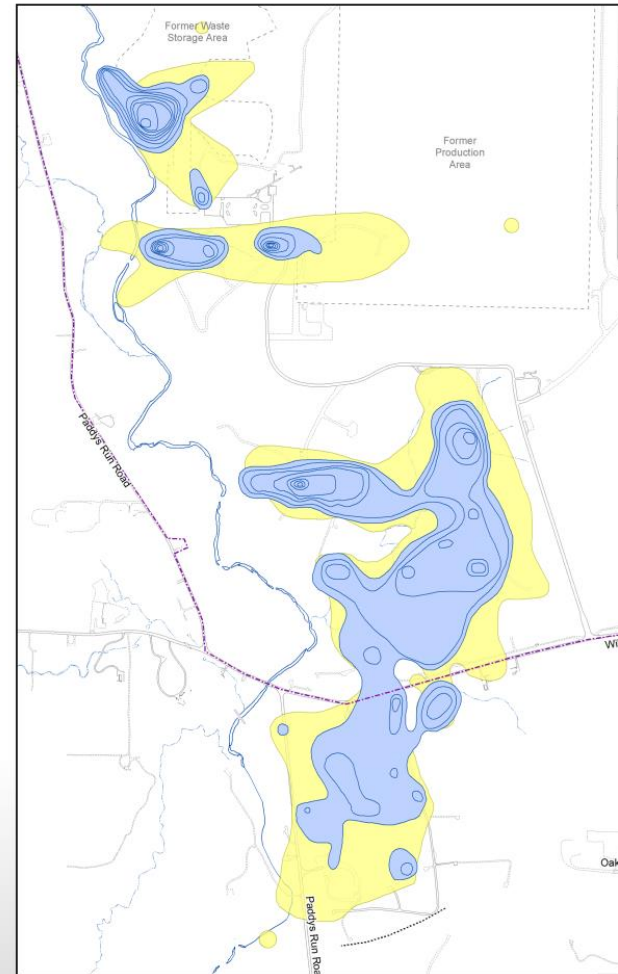
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The maximum uranium plume footprint interpretation decreased by 4.5 acres from 2015 to 2016.



# Aquifer Restoration

Maximum Plume Acreage: 2006 and 2016

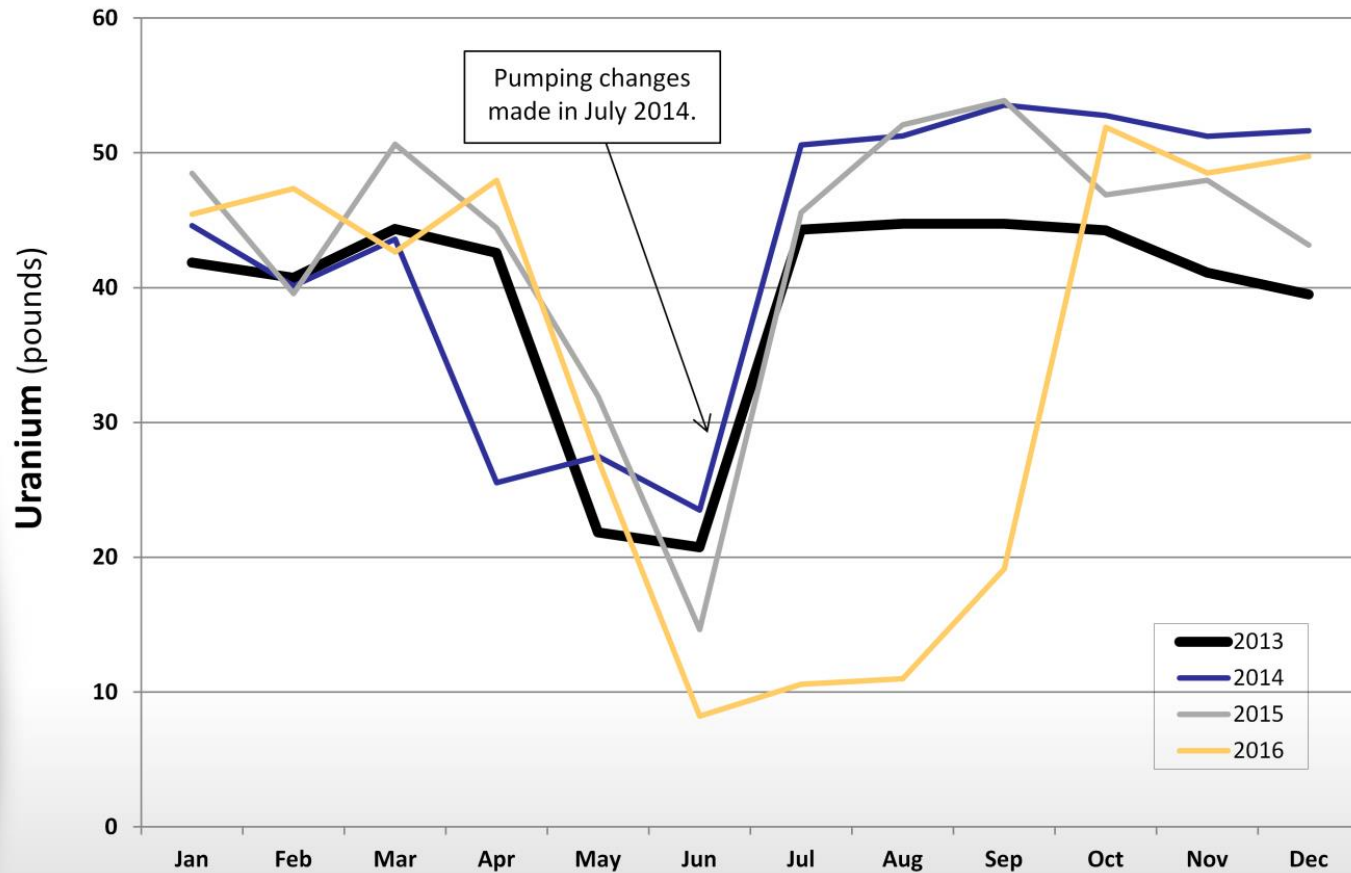


Maximum size of uranium plume footprint interpretation was 189.3 acres in 2006.  
Maximum size of uranium plume footprint interpretation was 105 acres in 2016.



# Aquifer Restoration

## Uranium Removed: 2014 Operational Change



More uranium is being removed from the aquifer as a result of operational adjustments implemented in 2014.

# Aquifer Restoration



Four wells were rehabilitated in 2016 to address iron plugging. Iron plugging decreases the pumping efficiency of the well.



# Public Activities

- Site use
- Events



Since the site opened to the public in 2008, schools, conservation organizations, former workers, hikers, and many others have used the site, the Visitors Center, and the reservable spaces.



# Public Activities

## A Decade of Difference

**Celebrate!**  
**WEAPONS TO WETLANDS**  
**A Decade of Difference**  
Saturday, October 29, 2016  
10:00 a.m. to 2:00 p.m.

U.S. DEPARTMENT OF ENERGY Legacy Management  
- All programs begin in the Visitors Center -

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) invites you to remember the work that took the Fernald Feed Materials Production Center, to the Fernald Closure Project, to the Fernald Preserve. At the time, the project was one of the largest environmental cleanup operations ever undertaken in the history of the United States. See how the site has come full circle with the establishment of extensive natural habitats including wetland, prairies, and forest.

10:00 a.m. to 11:00 a.m. and 12:15 p.m. to 2:00 p.m.  
Ongoing shuttle bus and walking site tours available, guest exhibitors, and refreshments.

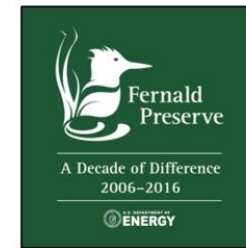
11:00 a.m. to 12:15 p.m.  
Special speakers from the DOE, current and former stakeholder groups and site contractors, regulators involved during the cleanup, and Cold War Patriots.

Noon  
National Day of Remembrance recognition.

Celebrate A Decade of Difference since the mission changed from environmental remediation to ongoing groundwater remediation, maintenance of onsite disposal facility, ecological restoration, environmental monitoring, and public access. See the land now—10 years later.

Reservations appreciated but not required. Email [Fernald@lm.doe.gov](mailto:Fernald@lm.doe.gov) or call (513) 648-3330 for reservations and more information.

[www.lm.doe.gov/fernal](http://www.lm.doe.gov/fernal)  
7400 Willey Road, Hamilton, OH 45013



Weapons to Wetlands: A Decade of Difference was celebrated on October 29, 2016. Ten years have passed since the land transitioned from environmental remediation to maintenance, restoration, and monitoring under the U.S. Department of Energy Office of Legacy Management.

# Public Activities

## Night Programs and Hikes



Nature-at-Night captures community interest. A variety of public night hikes and other activities were offered throughout the year.

# Public Activities

## Bird Watching

- Birders and photographers are frequent guests



Extensive grassland and wetland habitats at the site are recognized as regionally important birding areas that attract bird watchers and photographers.



# Public Activities

## Bobcats



9034.37 10/17

Bobcats have raised kittens onsite for four consecutive years.



# 2017 Site Projects

## Wastewater Treatment Optimization Project

- **Components/sub-projects**
  - Design new system
  - Remove old system components
  - Fabricate and install new system components



9034.38 10/17

The wastewater treatment optimization project is underway and anticipated to be completed in 2018.



# 2017 Site Projects

## Wetland Mitigation Erosion Repairs



Erosion repair was conducted in the Wetland Mitigation Project area.



# 2017 Site Projects

## Trail Improvements

- Paving
  - Weapons-to-Wetlands/Visitors Center trails
- Weapons-to-Wetlands Grove



Paving of the Weapons-to-Wetlands and Visitors Centers trails will provide better public access to the trails.



# 2017 Site Projects

## Extraction-Well Maintenance



Extraction well maintenance is a substantial ongoing effort.



# Collaboration Success

2017

- **Envirothon sponsored by southwest Ohio Soil & Water Conservation Districts**
- **Unmanned aircraft system (drone)**
  - U.S. Army Corps of Engineers research
  - Portsmouth Site OSDF video project
- **Pike County visitors**



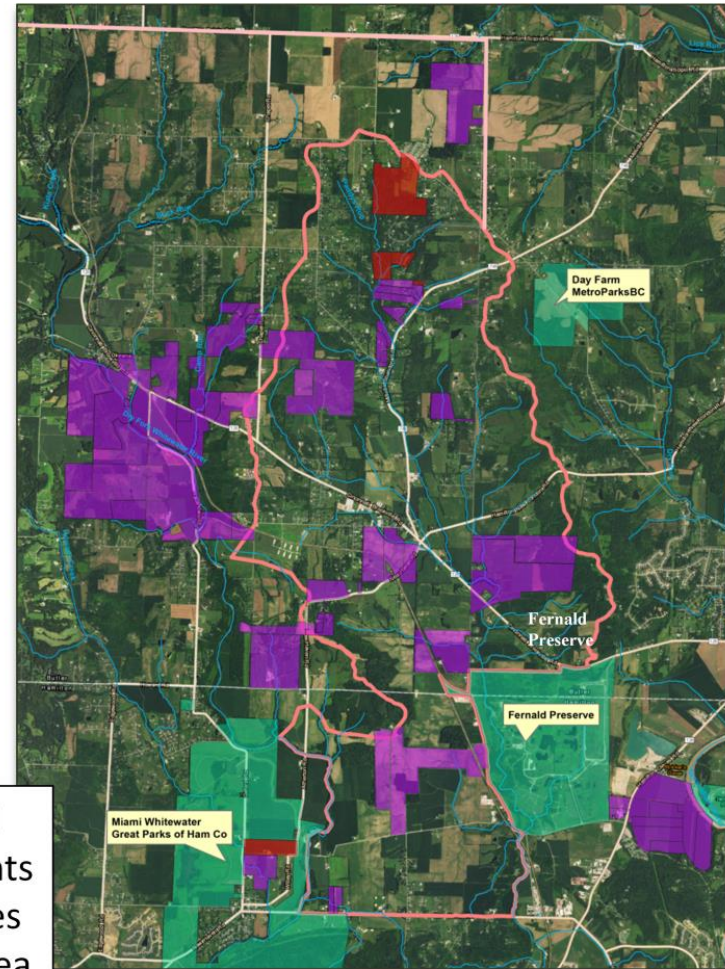
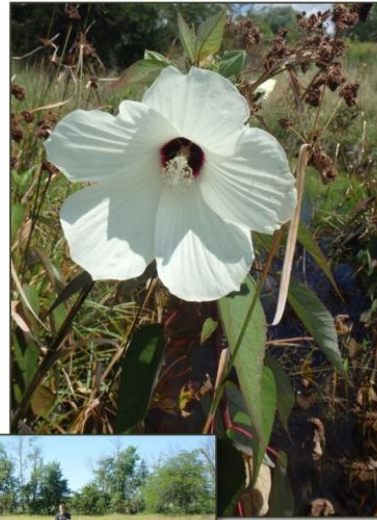
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DOE collaboration includes local organizations, other DOE sites, and government agencies.



# Natural Resource Trusteeship

September 2017



-  Parkland
-  Easements
-  Purchases
-  Focus area

9034.43 10/17

The Natural Resource Trustees have partnered with the Three Valley Conservation Trust to purchase conservation and agriculture easements in the Paddy Run watershed and above the associated Buried Valley Aquifer.



# Look Ahead

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- **Aquifer restoration**
- **Environmental monitoring**
- **Site and OSDF monitoring and maintenance**
- **Restored area monitoring and maintenance**
- **Prescribed burns**
- **American burying beetle recovery program**
- **Unique educational programs**
- **Complete Wastewater Treatment Optimization Project**

Numerous work activities are planned for the coming year.



# Questions and Contacts

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## **Sue Smiley**

Fernald Preserve Manager  
U. S. Department of Energy  
Office of Legacy Management  
(513) 648-3333  
[sue.smiley@lm.doe.gov](mailto:sue.smiley@lm.doe.gov)

## **Penny Borgman**

Interpretive Services  
Navarro Research and Engineering, Inc.  
(513) 648-3334  
[penny.borgman@lm.doe.gov](mailto:penny.borgman@lm.doe.gov)

## **General**

(513) 648-6000  
[fernald@lm.doe.gov](mailto:fernald@lm.doe.gov)  
[www.lm.doe.gov](http://www.lm.doe.gov)

The next annual Fernald Preserve community meeting will take place in fall 2018.