



U.S. DEPARTMENT OF
ENERGY

Legacy
Management



Fernald
Preserve

Community Meeting

October 18, 2016

The U. S. Department of Energy (DOE) Office of Legacy Management's (LM) 13th annual community meeting on the Fernald Preserve was held October 18, 2016, at the Fernald Preserve Visitors Center. The 12 guests in attendance received a summary of the *2015 Site Environmental Report* and an update on site activities.



Agenda

- **Safety and Health**
- ***Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Five-Year Review***
- ***Comprehensive Legacy Management and Institutional Controls Plan (LMICP)***
- ***Site Environmental Report (SER)***
- **Site operations**
- **Public activities and nature**
- **Site projects**
- **Natural Resource Trusteeship**
- **Look ahead**

Community meeting agenda.



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.**

LM's mission at the Fernald Preserve.



Worker Safety and Health

Occupational Safety and Health Administration Recordable Rates

Industry
(Remediation Services)
1.4

DOE Complex
0.9

LM
0.9

Fernald Preserve

Restricted Days
0

First Aid
0



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



Navarro Research and Engineering, Inc.

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**
 - Public Affairs

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



CERCLA Five-Year Review

- CERCLA requirement
- Determines whether the remedy remains protective of human health and the environment
- Community input received during review process
- Approved by regulators September 9, 2016
- <http://energy.gov/lm>



The Comprehensive Environmental Response, Compensation, and Liability Act requires a five-year review.



CERCLA Five-Year Review

Issues

- **Related to perfluorinated compounds (PFC) and has two milestones:**
 - **Submit PFC groundwater screening sampling plan to include schedule for sampling and reporting (December 31, 2016)**
 - **Submit comprehensive PFC investigation plan (March 31, 2018)**
- **Related to certifying soil in uncertified areas following removal of the aquifer infrastructure (2040)**

Perfluorinated compounds are emerging contaminants per U.S. Environmental Protection Agency (EPA) and the site groundwater will be evaluated to confirm their presence or absence. The compounds are associated with foam firefighting agents like those used at the site's Fire Training Facility in the 1960s and 1970s. LM will be investigating to see if these compounds have migrated to the groundwater.



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 CERCLA remediation process and is a legally-enforceable document**
- **<http://energy.gov/lm>**

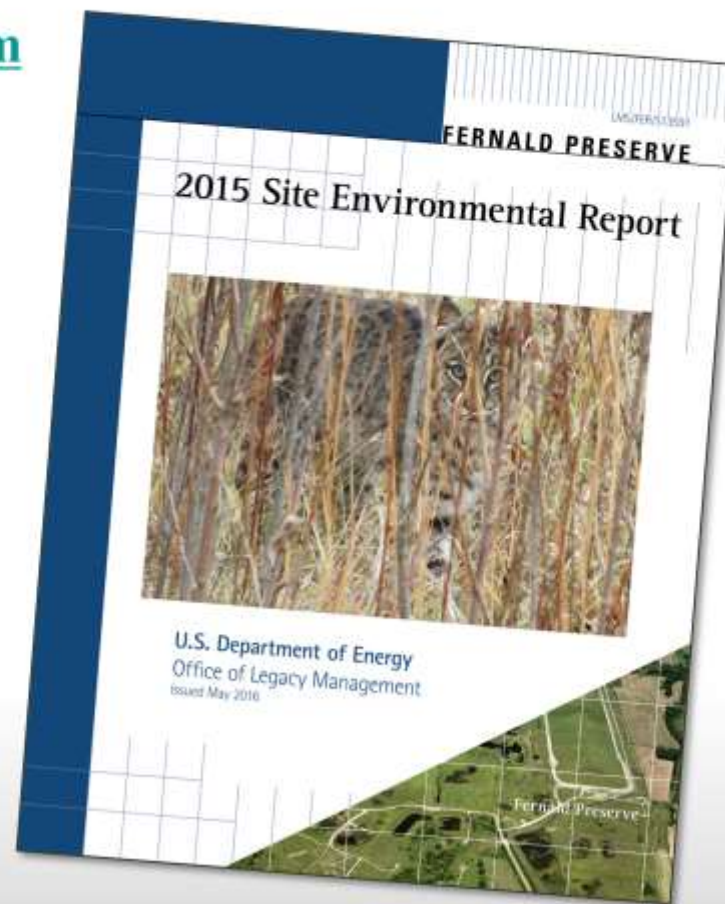
The *Comprehensive Legacy Management and Institutional Controls Plan* documents the requirements for Fernald Preserve's long-term care. It is reviewed and updated yearly and the latest version is available on the LM website.



Site Environmental Report

SER

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



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



Sampling

2015 and 2016

- **Surface water sampling at 21 locations**
- **Treated effluent sampling at 1 location**
- **Direct radiation monitoring at 11 locations**
- **On-Site Disposal Facility leak-detection monitoring at 42 locations**
- **Groundwater sampling at 142 monitoring wells**

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



Program Changes

2017

Years of data were evaluated and support changes

- **Surface water**
 - **Eliminating sampling at 5 locations**
 - **Reducing constituents at an additional 4 locations**
- **Sediment**
 - **Eliminating**
- **Direct Radiation (Dosimeter)**
 - **Eliminating**
- **Groundwater**
 - **Eliminating sampling (uranium) in 47 of the 142 monitoring wells**
 - **Reducing sampling (non-uranium) frequency in an additional 27 monitoring wells**

Years of data were evaluated and support changes to the environmental monitoring program. Changes are presented in *Comprehensive Legacy Management and Institutional Controls Plan*.



Program Changes

2017

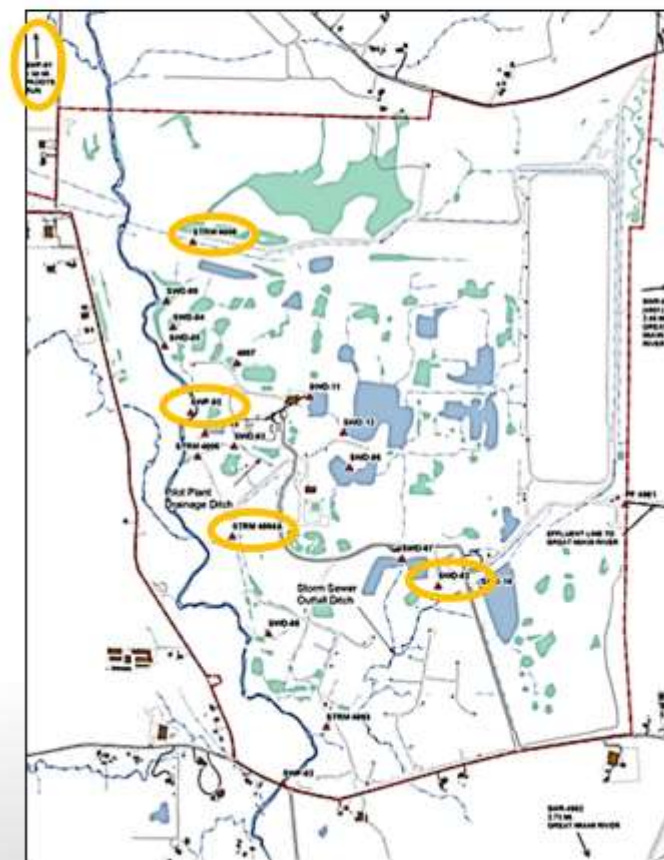
- **On-Site Disposal Facility (OSDF)**
 - Reducing constituents collected from the leachate collection system, leak detection system, and horizontal till wells from 24 to 4 analytes
 - Discontinuing annual sampling in the leachate collection system
 - Reducing the constituents in the Great Miami Aquifer monitoring wells from 24 to 13
 - Reducing the initial response leak detection accumulation rate to lower rate of 2.0 gallons per acre per day versus 20 gallons per acre per day
 - Reducing the monitoring period for the OSDF camera survey from 5 to 10 years


Changes are summarized at the end of the discussion on each component.



Monitoring

Surface Water and Treated Effluent



 Stop monitoring

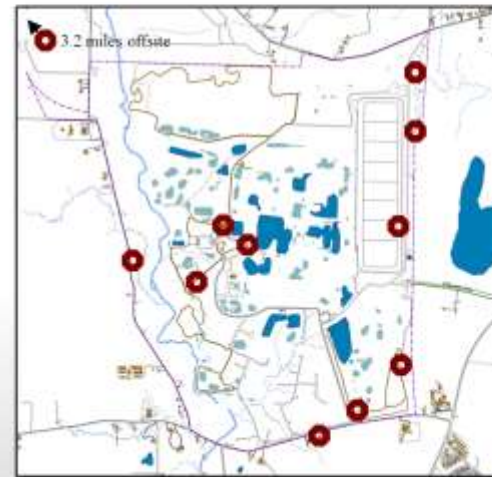
Surface water continues to be monitored at numerous locations onsite and offsite.



Monitoring

Dosimetry

- **Direct radiation monitoring completed at 11 locations**
- **On-property results are indistinguishable from off-property**
- **Monitoring will be discontinued in 2017**



Dosimeter monitoring results for 2015 are similar to historical results.



Ecological Restoration

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



Ecological restoration work includes maintenance, monitoring, and inspections.



Ecological Restoration

Restored-Area Maintenance

- **Vegetation management**
- **Inspection follow-up**



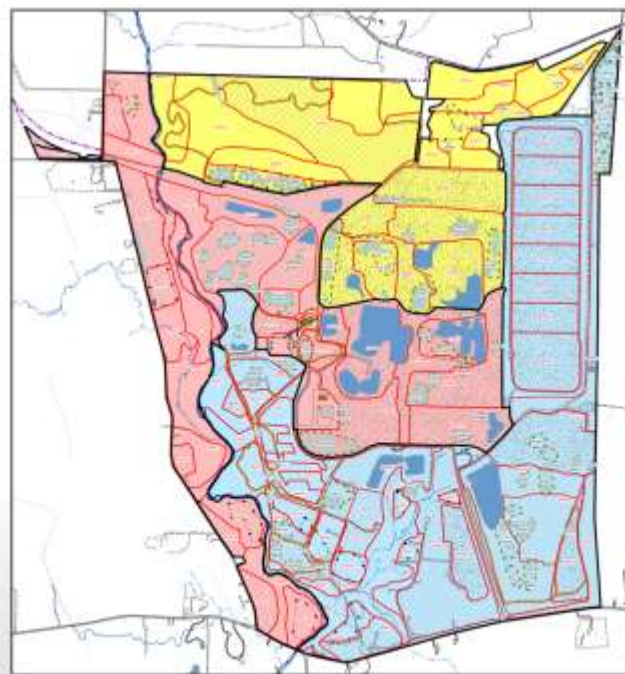
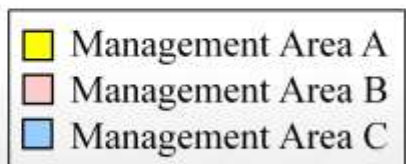
Restored area maintenance includes vegetation management and follow-up from site inspections.



Ecological Restoration

Monitoring

- **Wetland mitigation**
- **Functional**
- **Implementation**



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



Ecological Restoration

Inspections

- Site
- On-Site Disposal Facility
- Trails



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

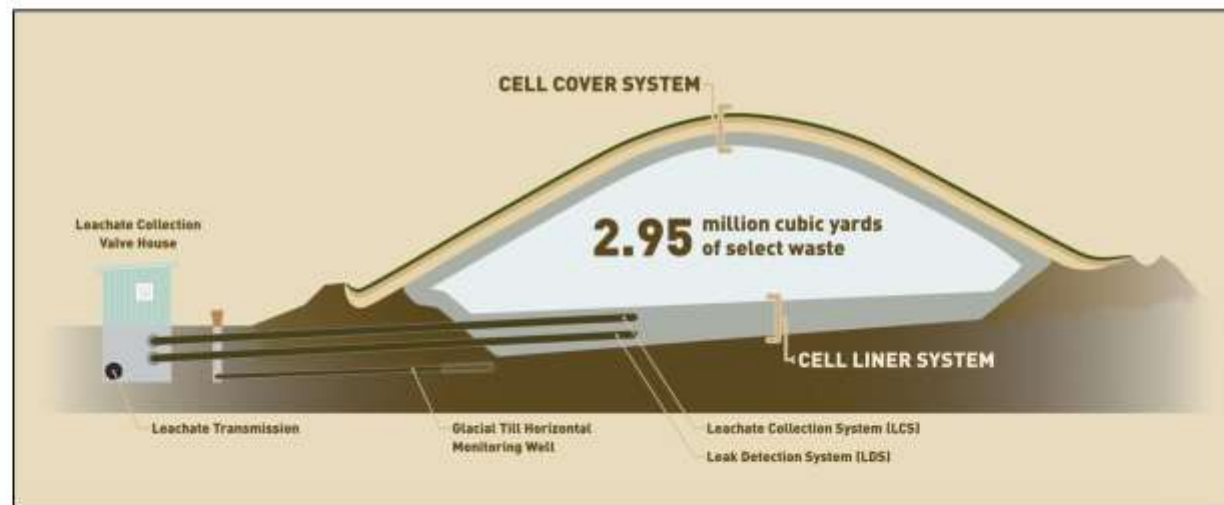


The On-Site Disposal Facility is an engineered waste-storage area that holds 2.95 million cubic yards of waste.



On-Site Disposal Facility

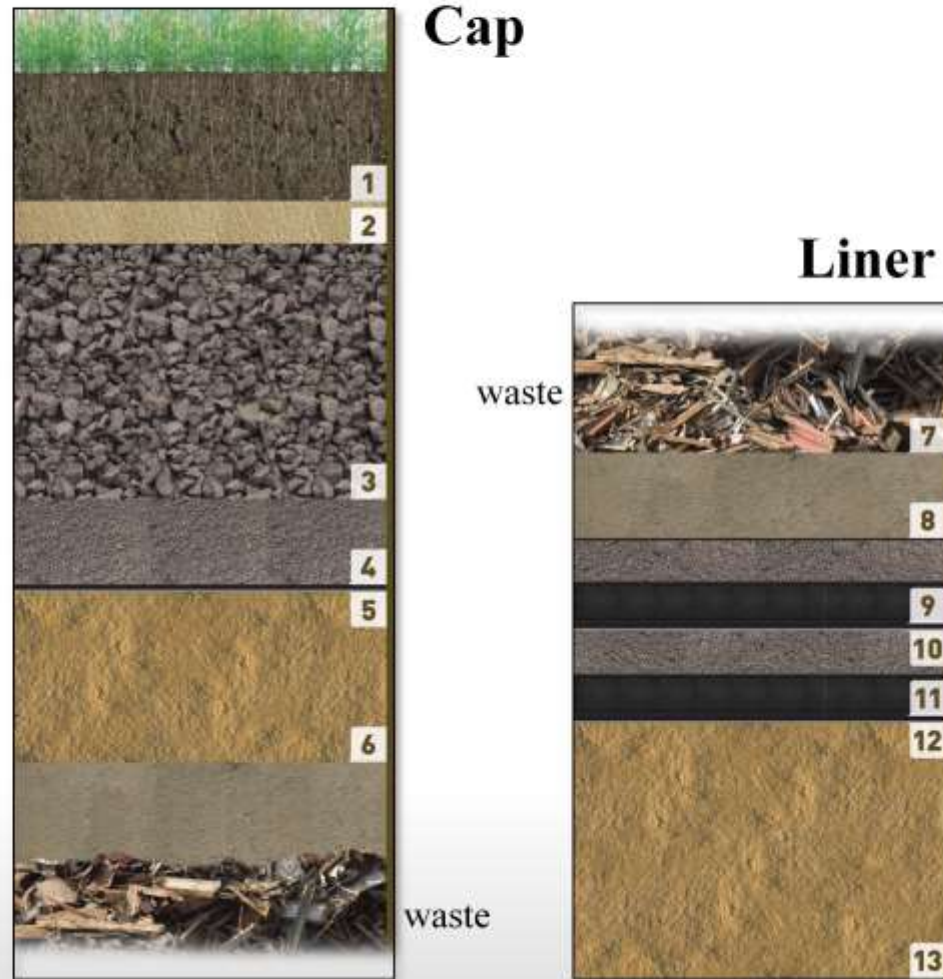
Leachate Collection System



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

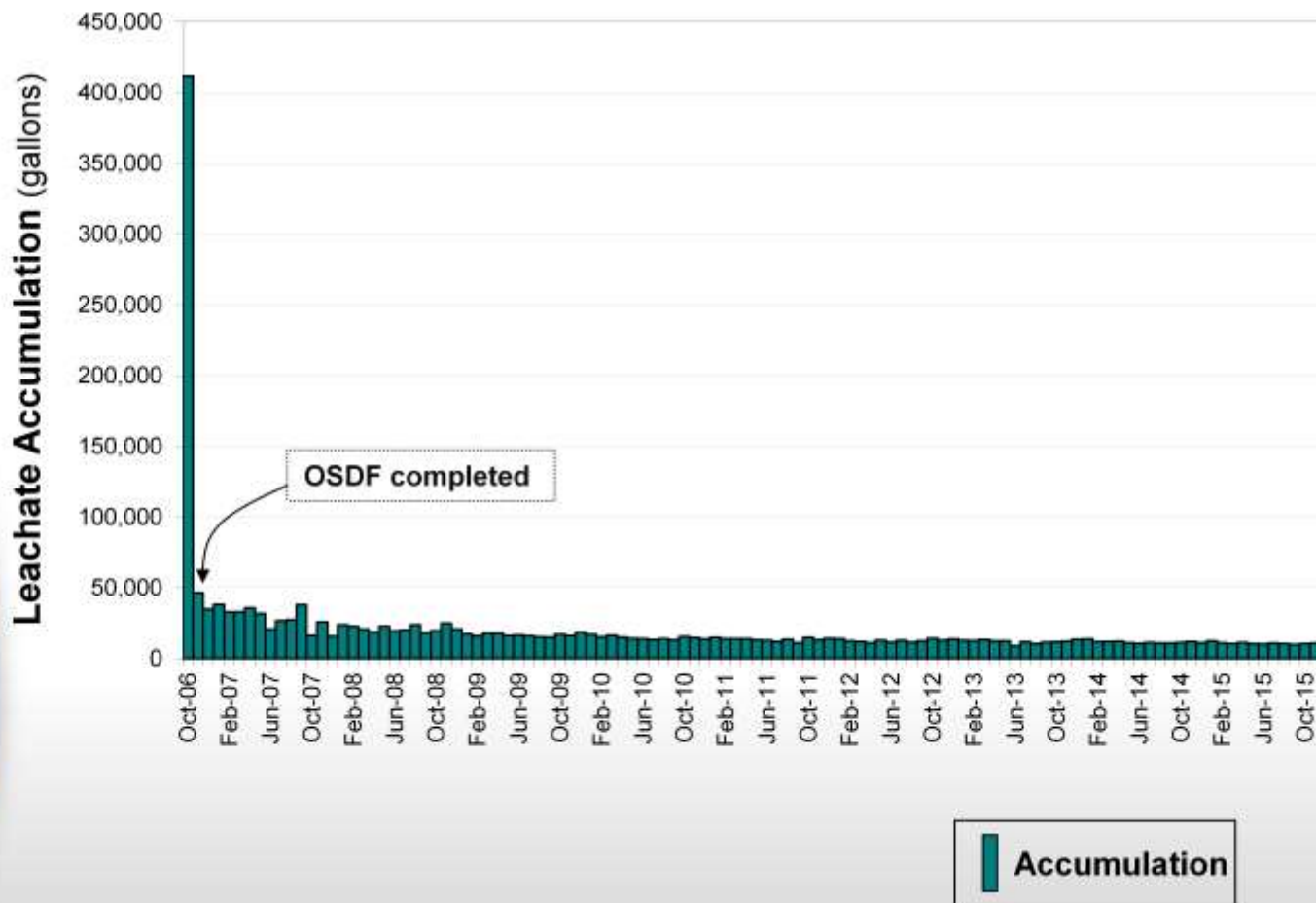


Waste is safely encapsulated between a 9-foot cap and a 6-foot liner within the On-Site Disposal Facility.



On-Site Disposal Facility

Leachate Collection System – Monthly Flow

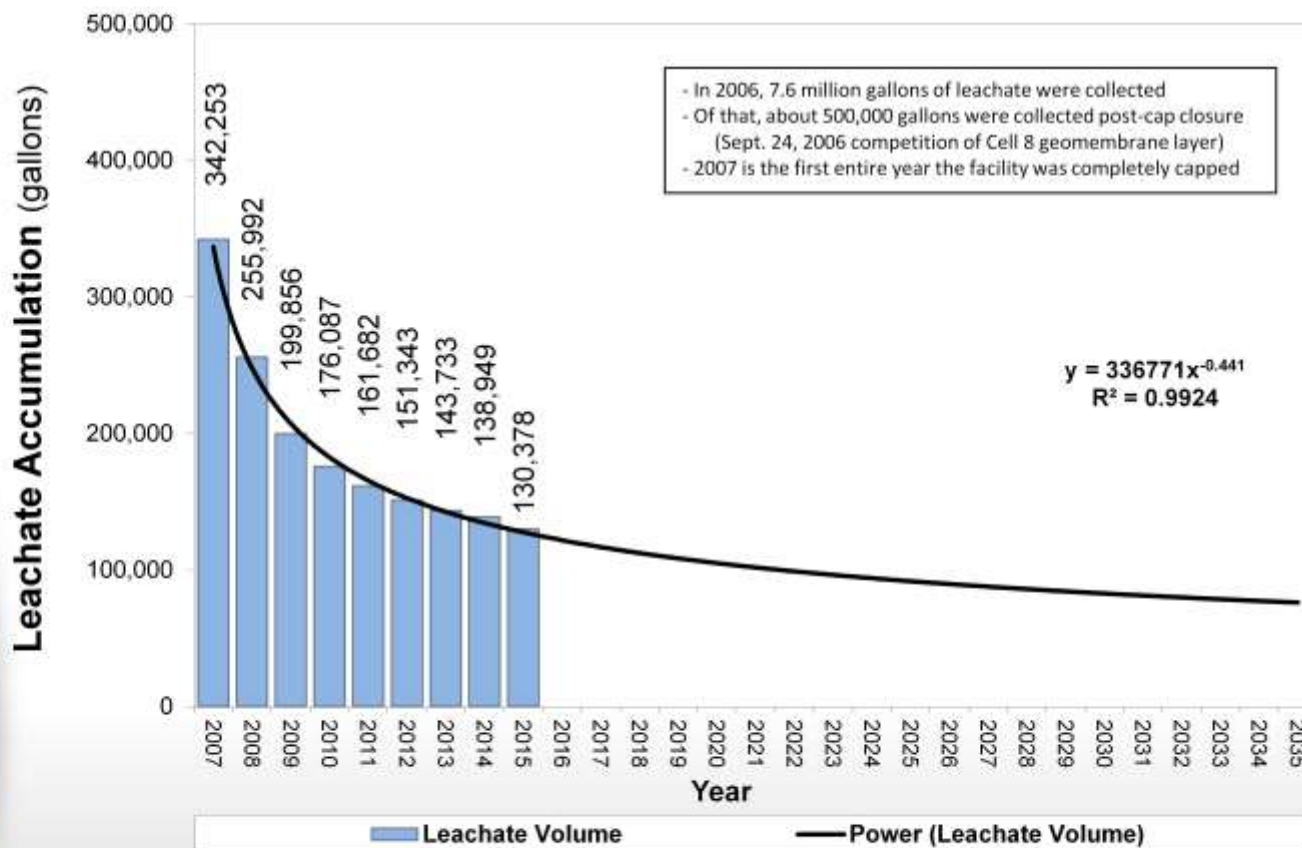


Leachate is the moisture in the waste within the On-Site Disposal Facility. The leachate is collected and transferred to a treatment facility. Before the cover system was completed in October 2006, hundreds of thousands of gallons of leachate flowed each month. By 2015, leachate flows decreased to a monthly average of 10,865 gallons.



On-Site Disposal Facility

Leachate Collection System – Annual Flow

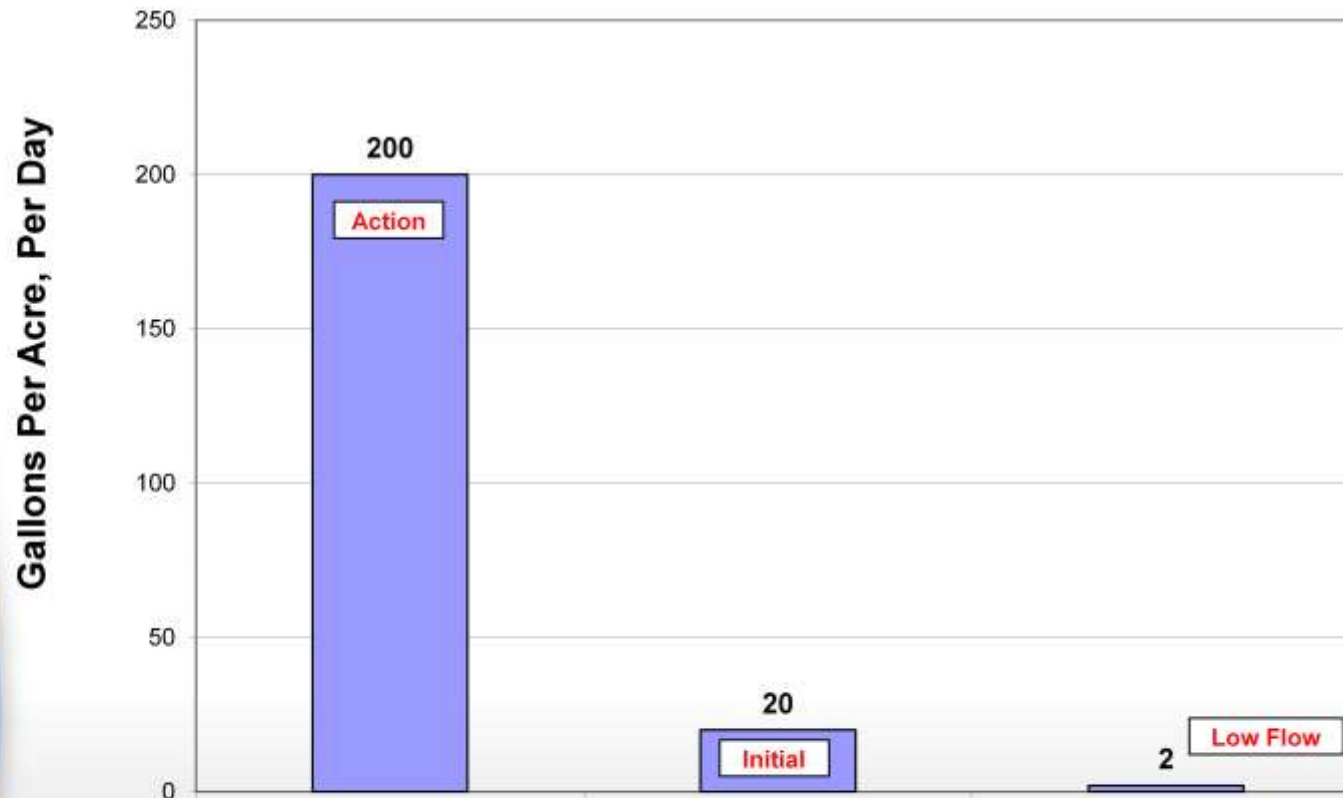


Leachate is the moisture in the waste within the On-Site Disposal Facility. The leachate is collected and transferred to a treatment facility. Annual leachate flow continues to decline.



On-Site Disposal Facility

Leakage Detection System – Flow Rates



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	Maximum Accumulation Rate (gpad)	Maximum Flow Rate (gpd)
2008	1.36	8.7
2009	0.48	3.1
2010	0.21	1.3
2011	0.38	3.5
2012	0.1	0.64
2013	0.07	0.4
2014	0.06	0.4
2015	0.23	1.5

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

Leak Detection System accumulation rates in Cells 1 and 8 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

Monitoring Reductions

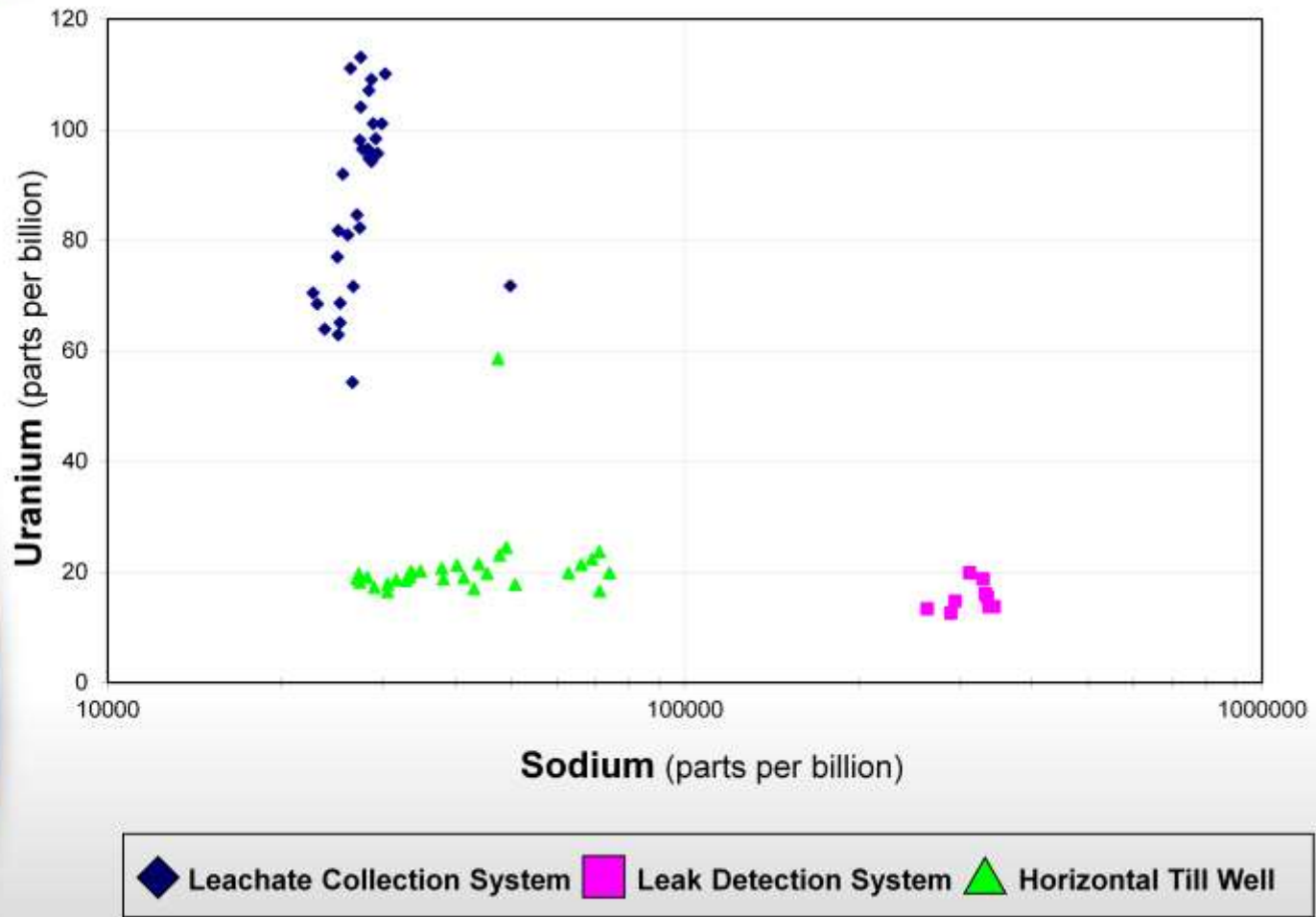
- **Over a decade of geochemical studies and statistical evaluations generated a very conservative list of 24 monitoring parameters**
- **An independent evaluation of the process and results led to a recommendation to remove 12 of the parameters**
- **With approval of the LMICP, the site will implement the recommendation beginning in January 2017**
- **The result should be increased monitoring reliability by reducing the chance of false conclusions**

With the EPA, Ohio EPA, and stakeholder approval, the list of parameters being monitored in the On-Site Disposal Facility will be reduced beginning in January 2017.



On-Site Disposal Facility

Uranium vs. Sodium Concentrations: Cell 3 (Bivariate Plot)



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

Piping Camera Survey



2010
Pre-cleaning

2011
Post-cleaning

2015

On-Site Disposal Facility leachate lines have been routinely inspected using a camera. Frequency of these inspections is being reduced to once every 10 years.



On-Site Disposal Facility

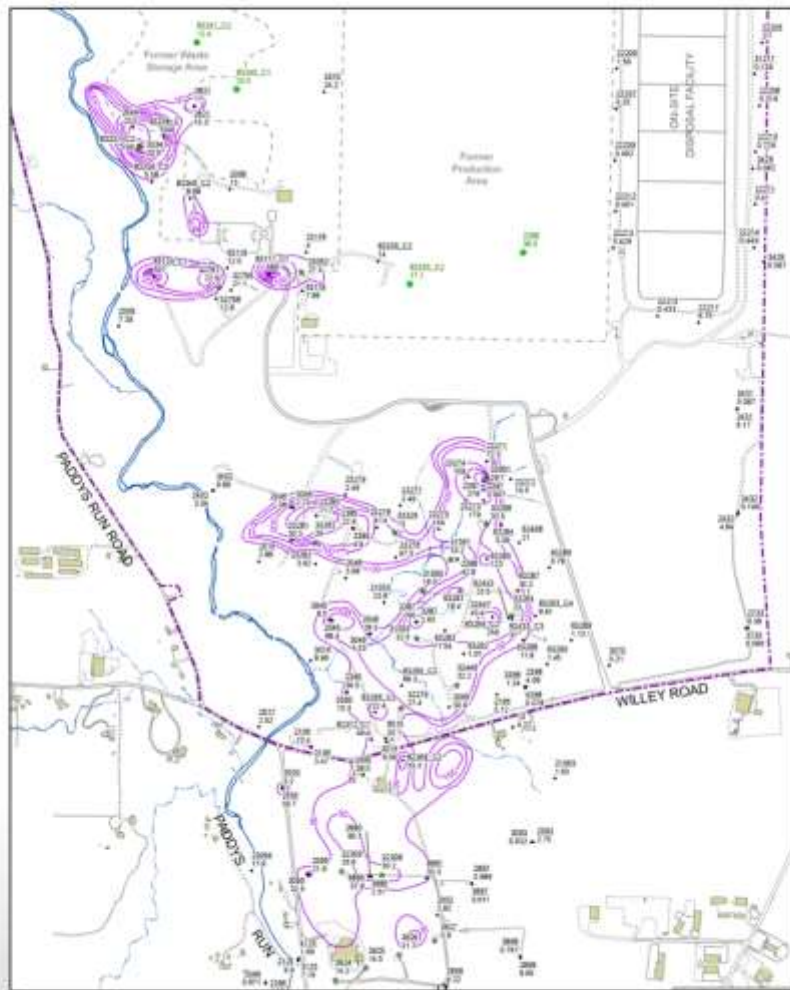
Performance: 2015

- **No indication of leaks**
- **Highest recorded levels of Leak Detection System accumulation:**
 - Cell 6: 0.23 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

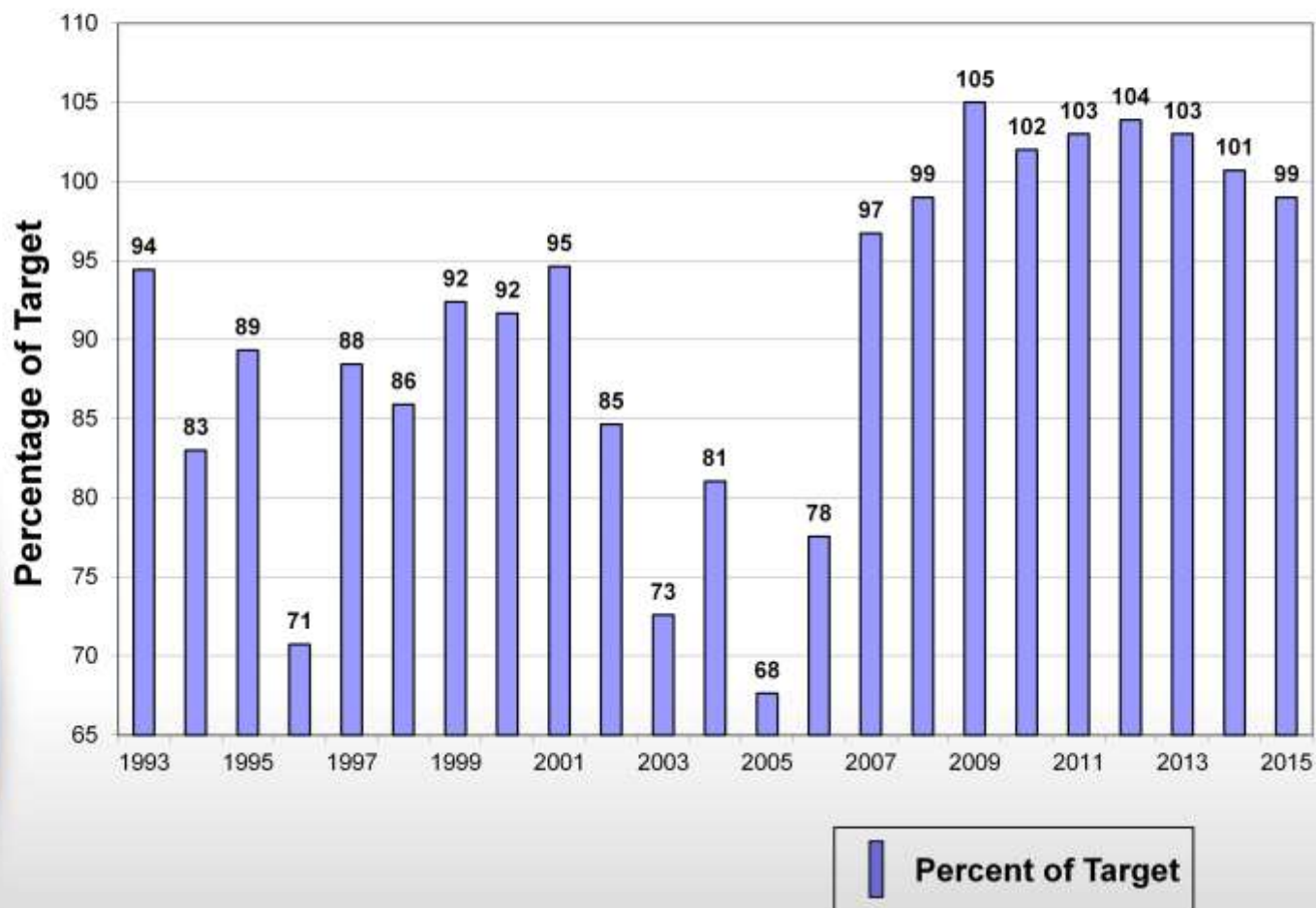


Groundwater cleanup continues at the site.



Aquifer Restoration

Pumping: Percentage of Target Achieved



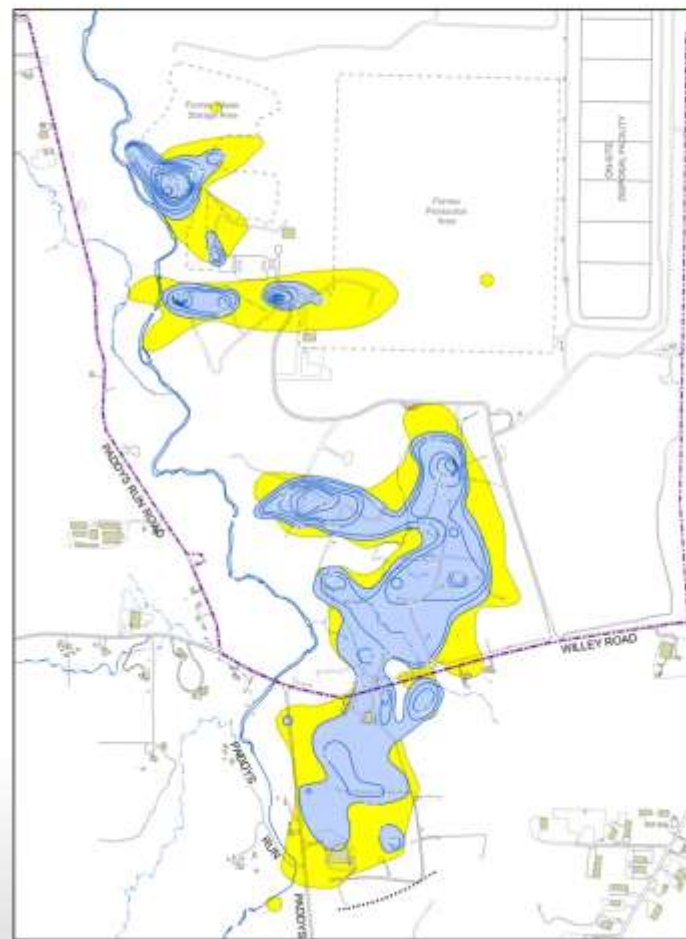
Since site closure in 2006, operations have achieved at least 97 percent of the planned operation targets annually.



Fernald
Preserve

Aquifer Restoration

Maximum Plume: 2006 and 2015



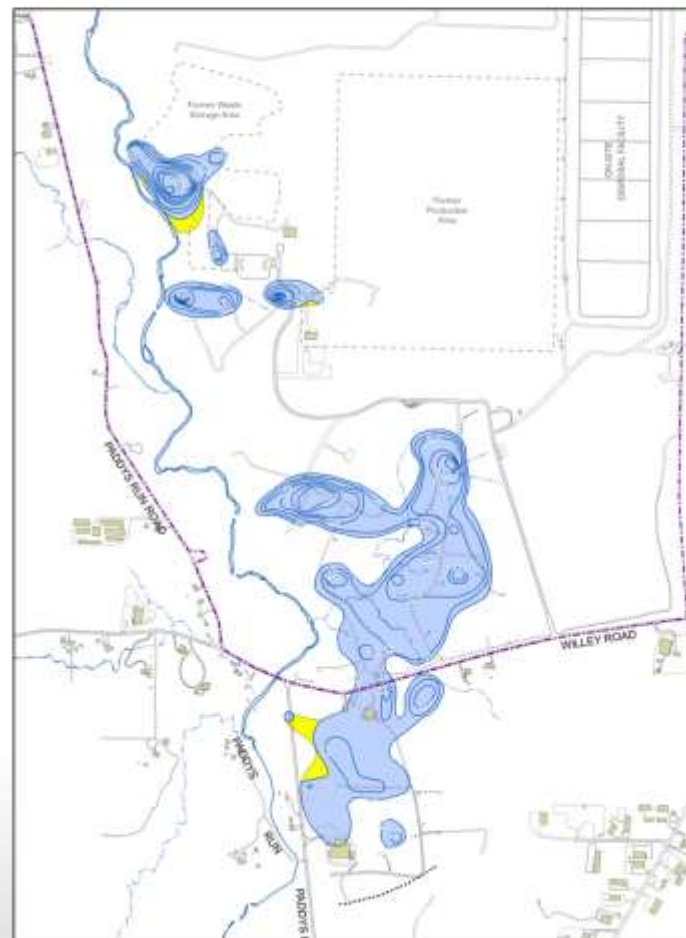
Maximum size of uranium plume footprint was 189.3 acres in 2006.

Maximum size of uranium plume footprint was 108.1 acres in 2015.



Aquifer Restoration

Maximum Plume: 2014 and 2015



The maximum uranium plume footprint interpretation decreased by 2.8 acres from 2014 to 2015.



Fernald
Preserve

Aquifer Restoration

Uranium Removed: 2014 Operational Change

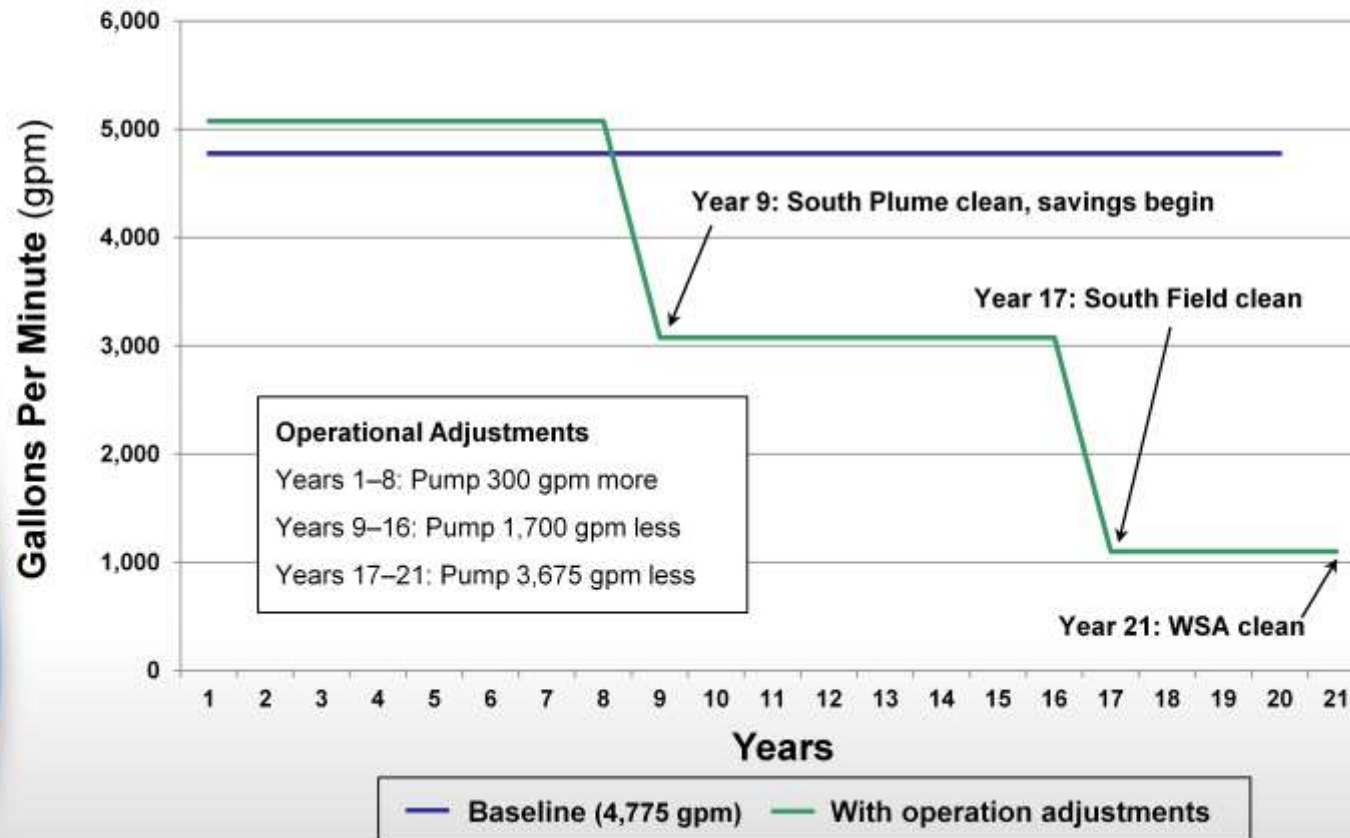


More uranium is being removed from the aquifer as a result of operational adjustments implemented in 2014.



Aquifer Restoration

Well Field Pumping Schedule



The groundwater model predicts that pumping at slightly higher rates now will allow pumping rates to be reduced in the future.

Aquifer Restoration

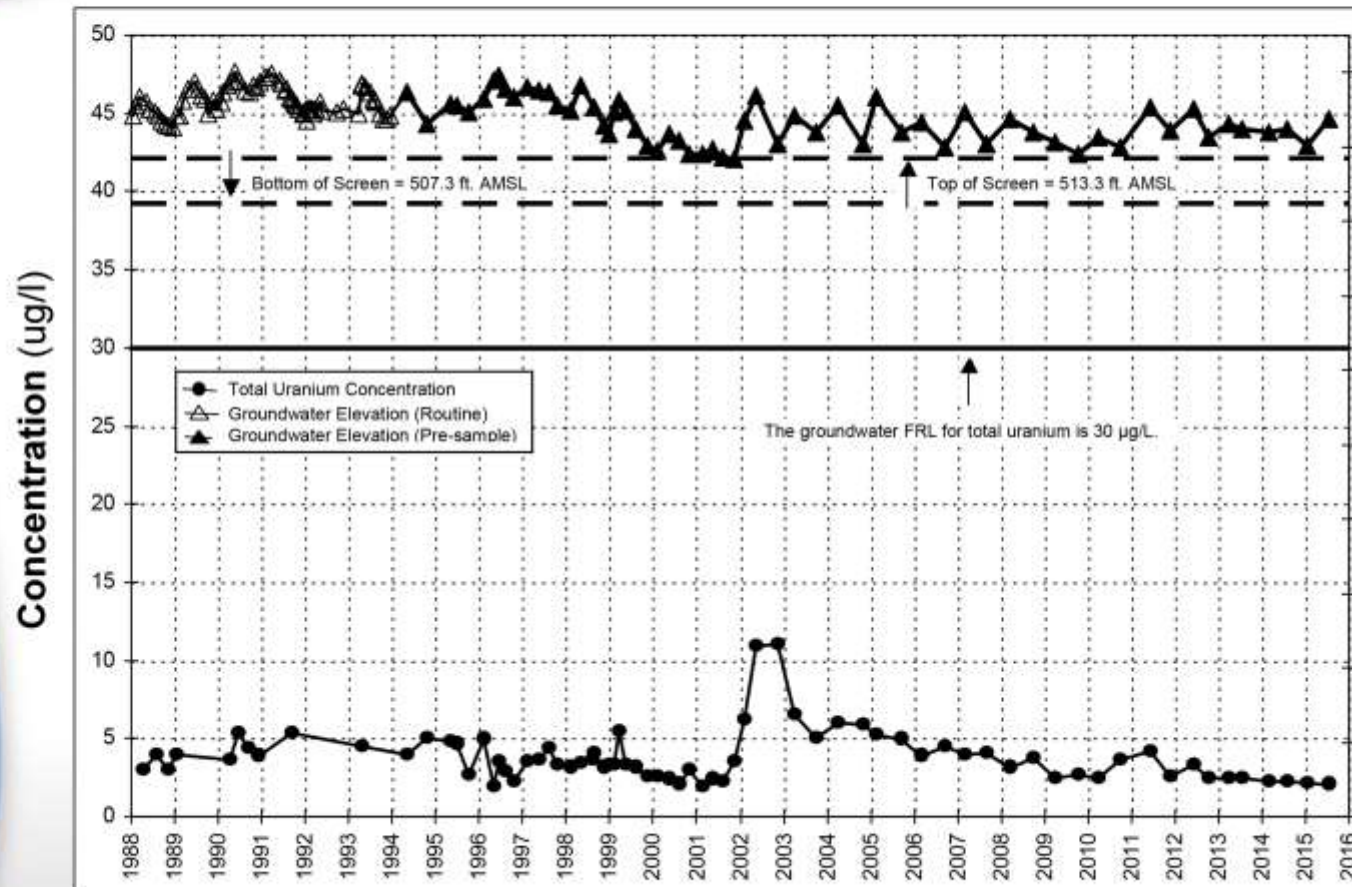


Four wells were rehabilitated this summer to address iron plugging. Iron plugging decreases the pumping efficiency of the well.



Aquifer Restoration

Monitoring Reductions



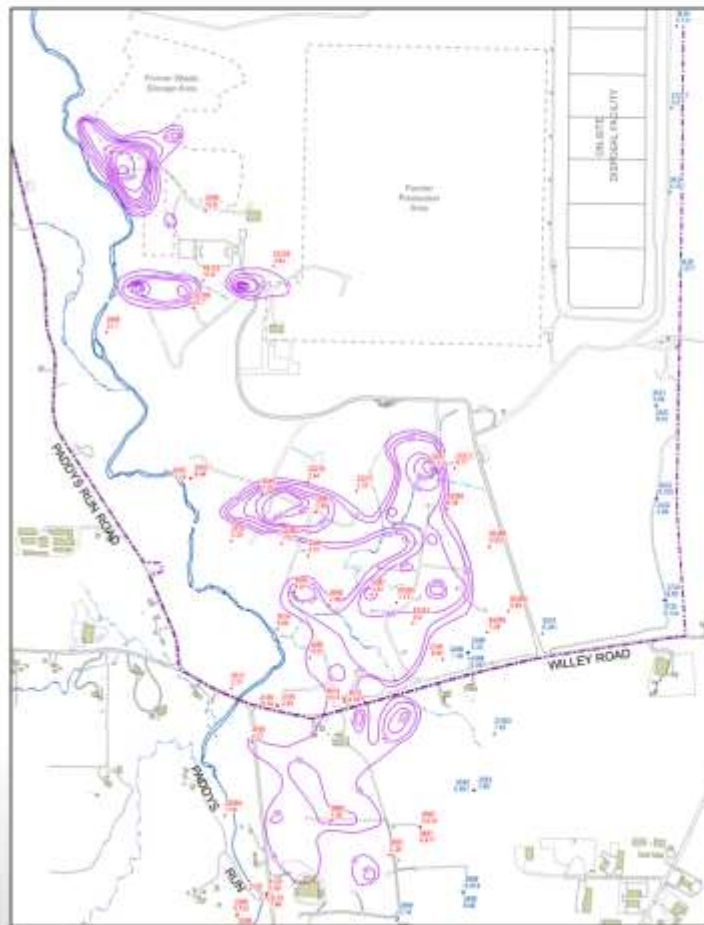
Data trends at select monitoring wells have been stable for over 10 years. Monitoring at some wells is no longer needed to determine the extent of the uranium plume.



Aquifer Restoration

Monitoring Reductions

- Stop
- Once a year
- ~ Plume contour



With EPA, Ohio EPA, and Stakeholder concurrence the amount of groundwater monitoring will be reduced beginning January 1, 2017.

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

Monarch Butterflies

- **Population rebounding**



The site provides important pollinator habitat and several programs were offered allowing citizens to learn more about, and participate in, efforts to support the declining monarch butterfly population.

Public Activities

Night 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



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

Public Activities

Bobcats



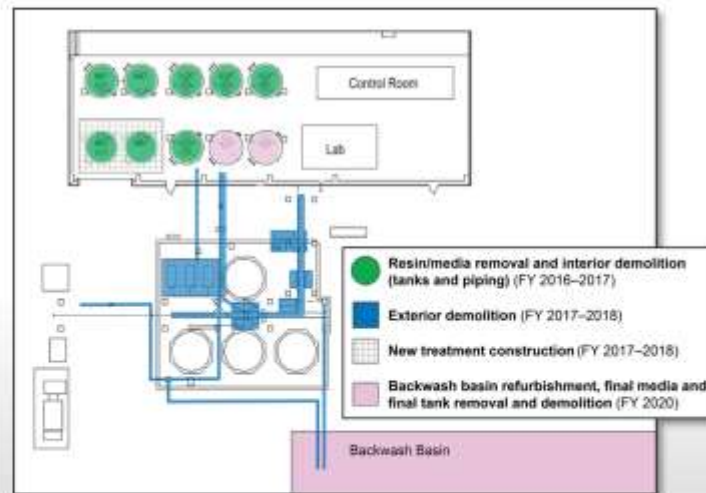
Bobcats have raised kittens onsite for 3-consecutive years.



Site Projects

Wastewater Treatment Optimization Project

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



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



Site Projects

Site-Wide Power Outage

- **Main electrical substation breaker failure**
- **Outage: July 5 through September 22**
- **Portable generators used for temporary power**
 - **Wastewater treatment facility (CAWWT)**
 - **Final effluent monitoring station**
 - **Visitors Center**
- **14 on-property wells went offline**
- **6 off-property wells continued pumping**
- **OSDF LCS/LDS valves closed**

A site-wide power outage occurred when electrical equipment failed at the site's substation.



Site Projects

Site-Wide Power Outage

- **Repair options evaluated by electrical engineering firm**
- **Repairs completed September 26**



Critical equipment and facilities were run on generators until electrical service was restored.



Site Projects

Honeysuckle Clearing



Honeysuckle clearing was conducted along the Shingle Oak Trail as part of ongoing efforts to remove invasive species from the site.



Site Projects

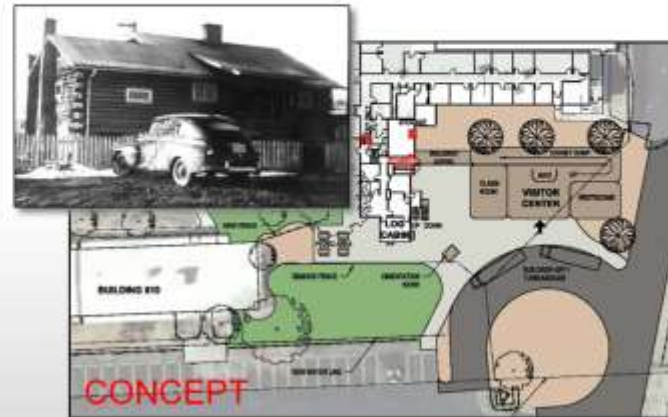
Extraction-Well Maintenance



Extraction-well maintenance is a substantial ongoing effort.

Success Stories

- **LM visitors centers**
- **Portsmouth Site Specific Advisory Board (SSAB) OSDF visit**



LM is expanding its network of visitors centers, and lessons learned from the site's cleanup continue to be shared.



Natural Resource Trusteeship

September 2016



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



Look Ahead

- **Continue aquifer restoration**
- **Continue environmental monitoring**
- **Continue site and OSDF monitoring and maintenance**
- **Continue restored area monitoring and maintenance**
- **Continue prescribed burns**
- **Continue American burying beetle recovery program**
- **Continue unique educational programs**
- **Repair Wetland Mitigation 1 area dams**
- **Complete NRT sponsored North Woodlot Enhancement project**
- **Continue Wastewater Treatment Optimization Project**

Numerous work activities are planned for the coming year.



Look Ahead

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 or call (513) 648-3330 for reservations and more information.

www.lm.doe.gov/fernaldd
7400 Willey Road, Hamilton, OH 45013

A 10-year anniversary celebration will be held October 29, 2016.



Questions and Contacts

Sue Smiley

Fernald Preserve Manager
DOE Office of Legacy Management
(513) 648-3333
sue.smiley@lm.doe.gov

Penny Borgman

Public Affairs
Navarro Research and Engineering, Inc.
(513) 648-3334
penny.borgman@lm.doe.gov

General

(513) 648-6000
fernald@lm.doe.gov
www.lm.doe.gov

The next annual Fernald Preserve community meeting will take place in fall 2017.