



Fernald Preserve 21st Annual Community Meeting



U.S. DEPARTMENT
of **ENERGY**

Office of Legacy Management

October 8, 2025



Agenda

- Natural Resource Trusteeship
- Site Mission
- CERCLA Five Year Review
- Comprehensive Legacy Management and Institutional Controls Plan
- 2024 Site Environmental Report
- Inspections and Natural Resource Management
- Monitoring
- On-Site Disposal Facility
- Aquifer Restoration
- Community Engagement
- General Site Updates



Staff

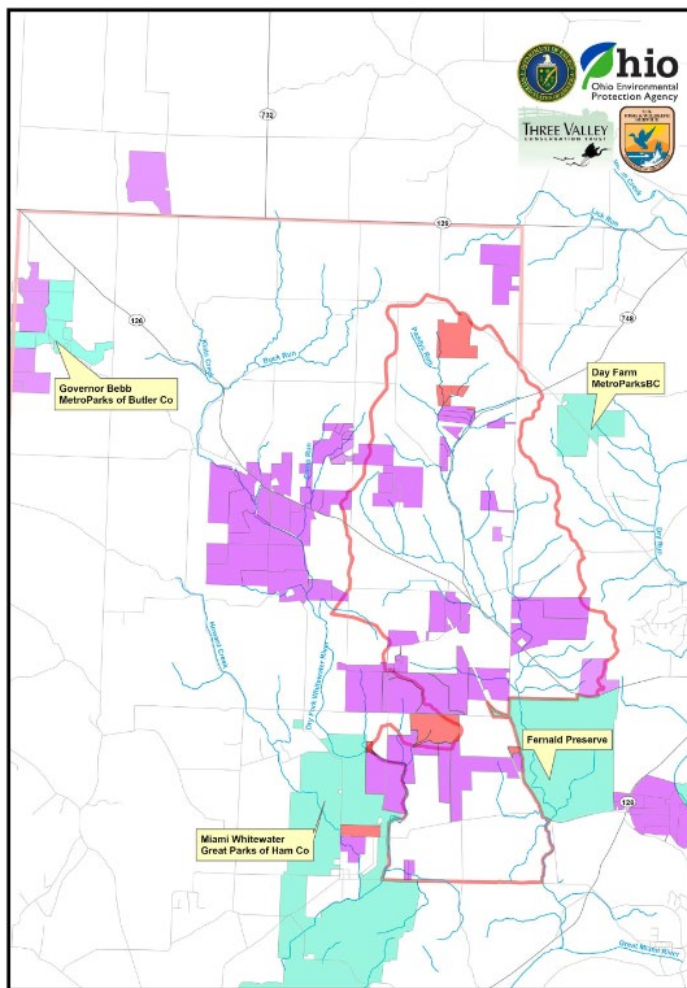
U.S. Department of Energy Office of Legacy Management

- **Brian Zimmerman**, Site Manager

RSI, Legacy Management Support Partner

- **Greg Lupton**, Site Lead
 - **Frances Boyens**, Interpretive Services
 - **Ken Broberg**, On-Site Disposal Facility and Aquifer Restoration
 - **Lisa McHenry**, Inspections and Natural Resource Management
 - **Karen Voisard**, Environmental Monitoring, Data Management, and Reporting





Natural Resource Trusteeship



Fernald Natural Resource Trustees 2024 Annual Report to the Public



Blanchard's Cricket Frog observed during Annual NRT Walkdown



Division of Environmental Response and Revitalization
Federal Facilities Section

June 2025

The 2024 NRT report
is available here:

https://dam.assets.ohio.gov/image/upload/epa.ohio.gov/Portals/30/FFS/docs/doe/fernalld/2024NRTAnnualRpt_FINAL.pdf

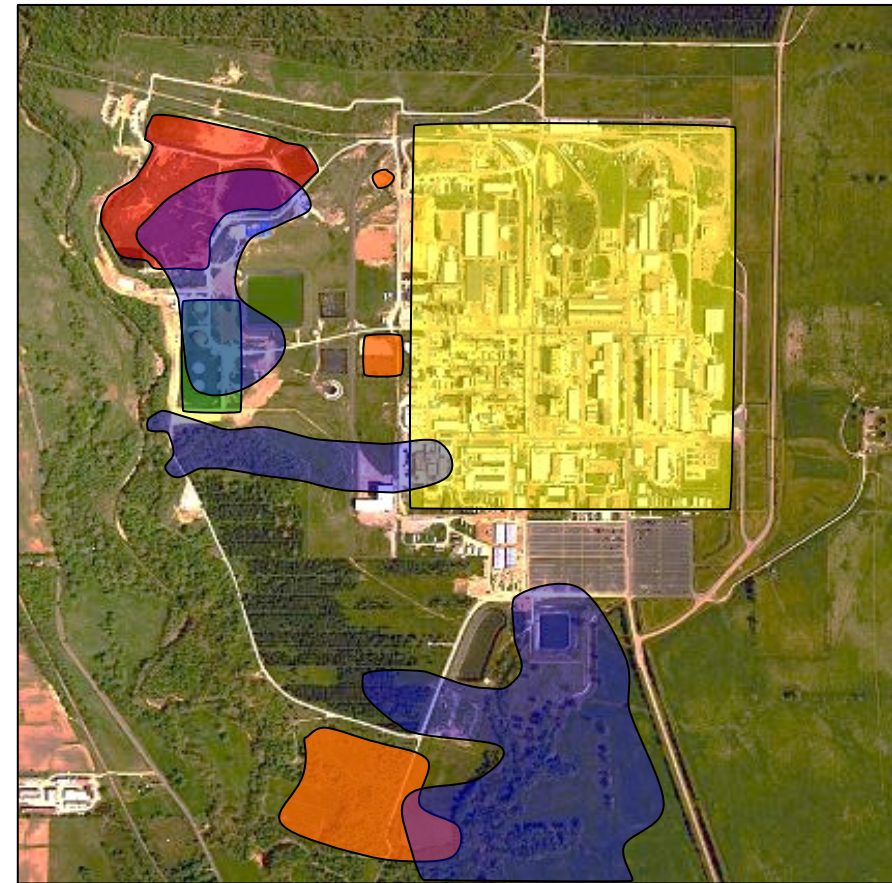


Fernald Preserve

- **Operable Unit (OU) 1**
 - Waste pits
- **OU2**
 - Other waste units
- **OU3**
 - Production area
- **OU4**
 - Silos
- **OU5**
 - Environmental media (soil, groundwater, surface water)

LM Mission

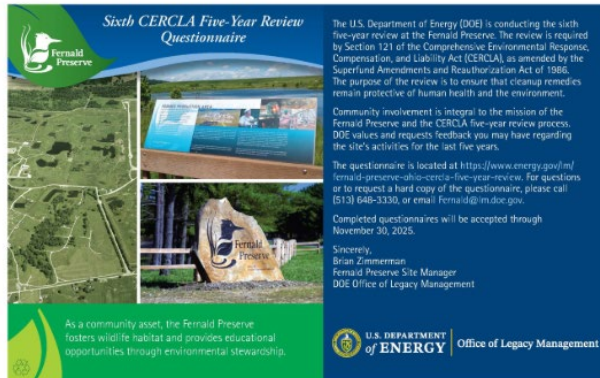
To fulfill the department's post-closure responsibilities and ensure the future protection of human health and the environment.



CERCLA Five-Year Review

Fernald Preserve, Ohio CERCLA Five-Year Review

The U.S. Department of Energy conducted the fifth Five-Year Review at the Fernald Preserve, as required by Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986. This act requires that remedial actions resulting in any hazardous substances, pollutants, or contaminants remaining onsite at levels that do not allow for unlimited use and unrestricted exposure be subject to a Five-Year Review. The purpose of the Five-Year Review was to ensure that the remedies implemented to clean up the site continue to be protective of human health and the environment. Community and regulatory input and feedback were integral to the review of this document.



The U.S. Department of Energy (DOE) is conducting the sixth five-year review at the Fernald Preserve. The review is required by Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986. The purpose of the review is to ensure that cleanup remedies remain protective of human health and the environment.

Community involvement is integral to the mission of the Fernald Preserve and the CERCLA five-year review process. DOE values and requests feedback you may have regarding the site's activities for the last five years.

The questionnaire is located at <https://www.energy.gov/fernalddoe/five-year-review>. For questions or to request a hard copy of the questionnaire, please call (513) 648-3330, or email fernalddoe@in.doe.gov.

Completed questionnaires will be accepted through November 30, 2025.

Sincerely,
Brian Zimmerman
Fernald Preserve Site Manager
DOE Office of Legacy Management

As a community asset, the Fernald Preserve fosters wildlife habitat and provides educational opportunities through environmental stewardship.

U.S. DEPARTMENT of ENERGY | Office of Legacy Management

- [Sixth CERCLA Five-Year Review Stakeholder Questionnaire \(September 2025\)](#)† Print version†
- [Fifth Five-Year Review Report \(September 2021\)](#)†
- [Fourth Five-Year Review Report \(August 2016\)](#)†
- [Third Five-Year Review Report \(September 2011\)](#)†
- [Second Five-Year Review Report \(August 2006\)](#)†
- [First Five-Year Review Report \(September 2001\)](#)†
- [CERCLA Records Search](#)†

- The periodic review is required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Its purpose is to determine whether remedy remains protective of human health and the environment
- The draft report is due to the U.S. EPA in April 2026
- Five-Year Review process:
 - Community involvement
 - Community notification
 - Document review
 - Data review and analysis
 - Site inspections
 - Questionnaires and interviews
 - Protective assessment

Above available online at <https://www.energy.gov/lm/fernalddoe/five-year-review>



CERCLA Five-Year Review



Sixth CERCLA Five-Year Review Stakeholder Questionnaire

The U.S. Department of Energy (DOE) is currently conducting the sixth five-year review at the Fernald Preserve, as required by Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). CERCLA requires a five-year review for remedial actions that result in any hazardous substances, pollutants, or contaminants remaining on-site at levels that do not allow for unlimited use and unrestricted exposure. The purpose of the five-year review is to ensure that the remedies implemented to clean up the site continue to be protective of human health and the environment.

Community and regulatory involvement is an integral part of the Fernald Preserve mission and the CERCLA five-year review process. DOE values and requests any input or comments you have regarding the site's activities since stakeholder feedback was collected for the last CERCLA five-year review in 2020. Completed questionnaires will be accepted through November 30, 2025.



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Questionnaires are available:

- Hard copy at the Visitors Center
- Via email requests to fernald@lm.doe.gov
- Fillable electronic copies online at <https://www.energy.gov/lm/fernald-preserve-ohio-cercla-five-year-review>

*Questionnaires will be accepted
through November 30, 2025*



Comprehensive Legacy Management and Institutional Controls Plan

- Describes the requirements for the site's long-term management
- Consists of two volumes
 - Volume I details site management
 - Volume II is a legally enforceable document required under the Comprehensive Environmental Response, Compensation, and Liability Act
- Available at www.energy.gov/lm/fernald-preserve-ohio-site
- Reviewed, revised, and submitted annually to the regulatory agencies
- Based on the review, four variances are available for stakeholder and regulator input



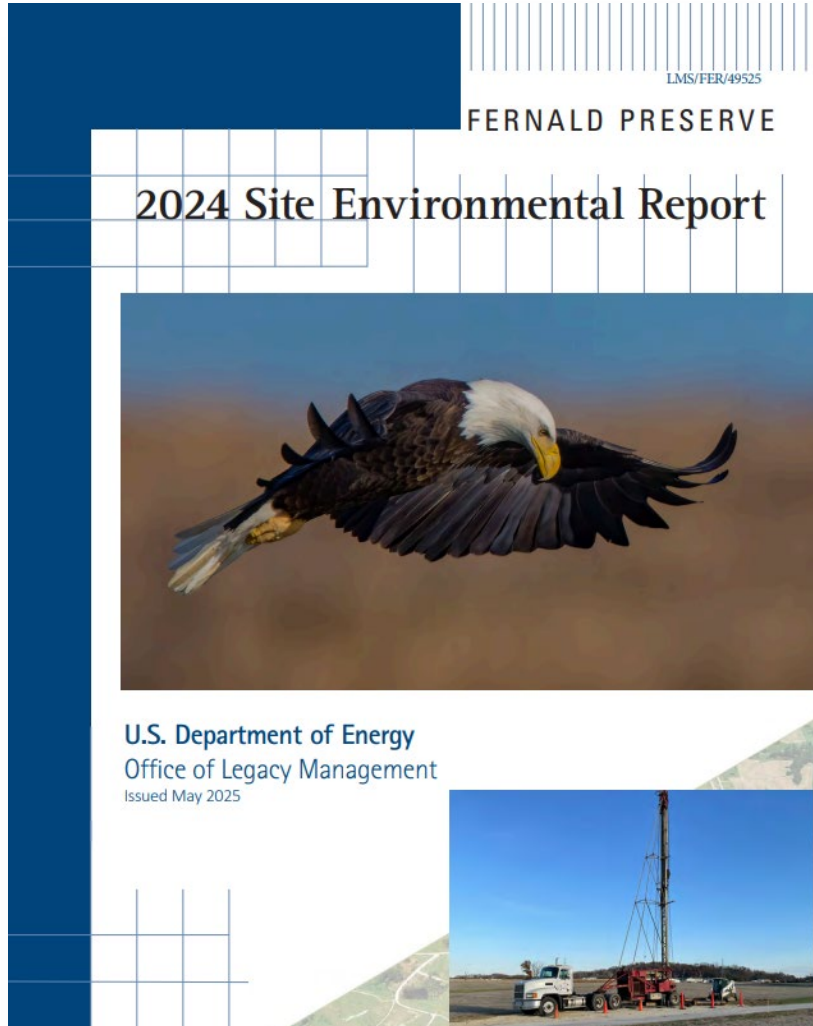
THE FOLLOWING ACTIVITIES
AND ITEMS ARE PROHIBITED:

- Alcohol and illegal drugs
- Firearms
- Removing or damaging natural or man-made materials
- Removing or damaging plants or plant parts (e.g., seed pods, fruit, leaves, firewood)
- Mushroom gathering
- Soil excavation
- Swimming or wading
- Pets
- Camping
- Hunting, trapping, or fishing
- Littering
- Fires, open flames, or smoking
- Traveling off public roadways or trails
- Using unmanned aircraft systems (drones)
- Tampering or damaging structures, fences, signs, or other property

Comprehensive Legacy Management and Institutional Controls Plan

Table 3. Prohibited Activities

Prohibited Activities Category	Number of instances in 2024
Visitor off trail	15
Dogs	4
Smoking	1
Drone use	1



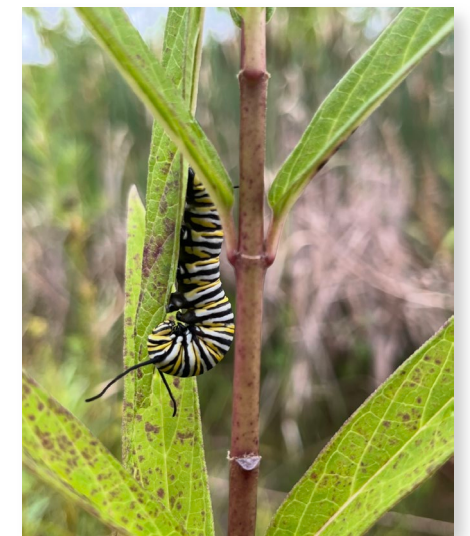
2024 Site Environmental Report

- www.energy.gov/lm/fernald-preserve-ohio-site
- Email requests to: fernald@lm.doe.gov





Inspections and Natural Resource Management

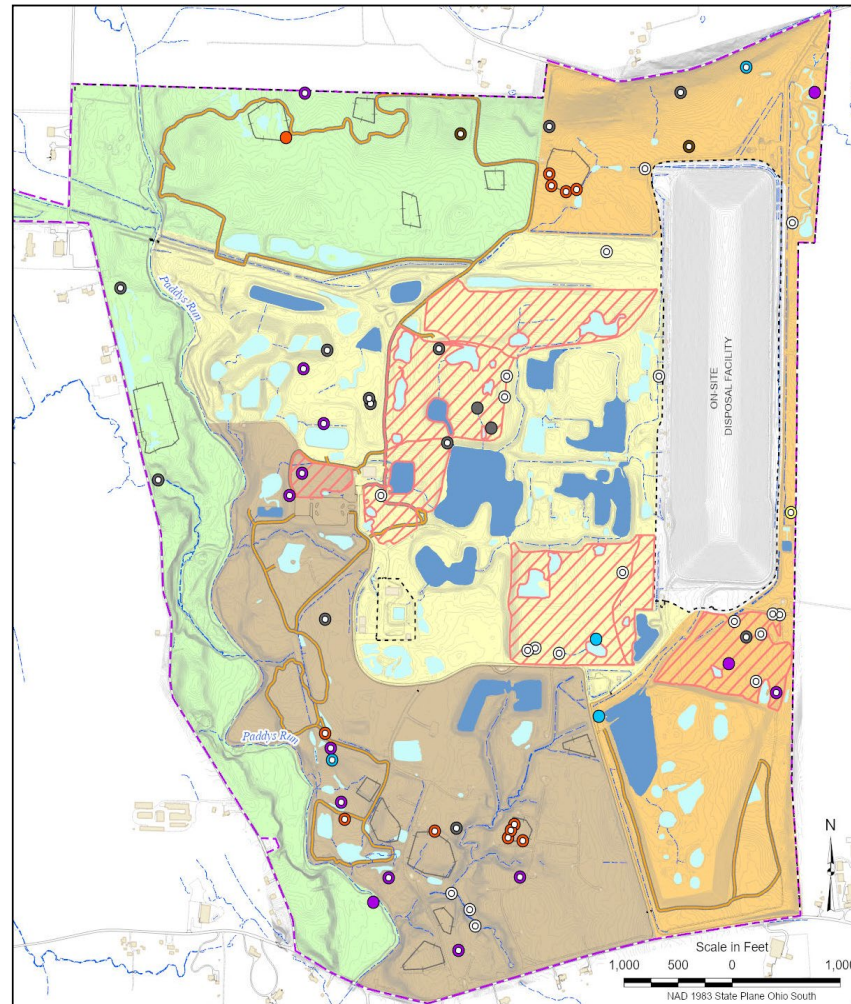


- | | | |
|-------------------------------|---------------------------|---------------------|
| Remediation Prairie Area | Remediation Wetland Area | Open Water |
| Remediation Successional Area | Perimeter Wetland Area | Wetland Basin |
| Existing Forest Area | Fernald Preserve Boundary | Intermittent Stream |
| Restoration Forest Area | | |
| Perimeter Successional Area | | |



Inspections

- Site
- Post-burn
- OSDF
- Trails



Inspection Finding [Number of Findings]

- Debris [19]
- Noxious or Invasive Species [14]
- Trash [14]
- Fence [12]
- Erosion [4]
- Structure [2]
- Biointrusion [1]
- Sign [0]
- Unauthorized Use [0]

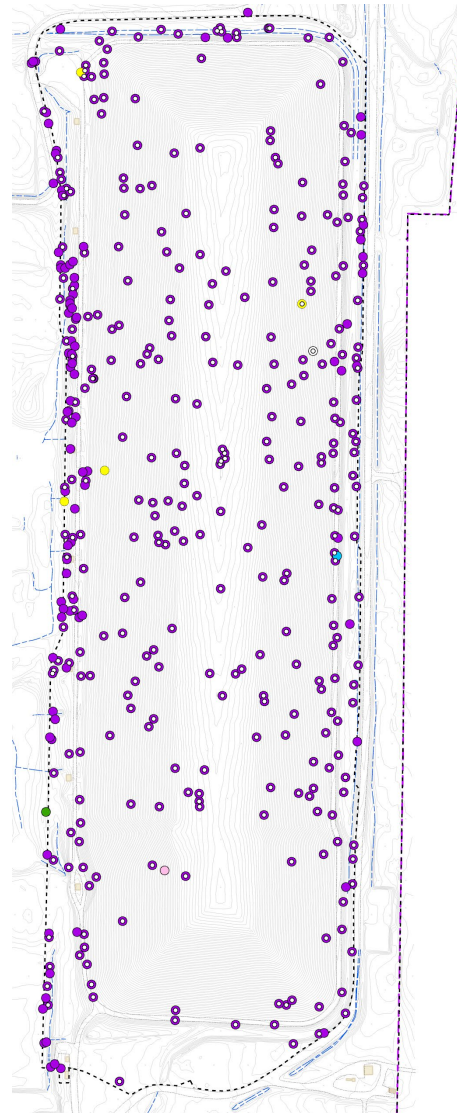
- Fernald Preserve Boundary
- Central Quadrant
- East Quadrant
- South Quadrant
- West Quadrant
- ▨ Prescribed Burn Area 2024
- Open Water
- Wetland

- Trail
- Deer Fence
- Fence
- Intermittent Stream
- Resolved Finding

Note: No radiologically-contaminated debris was identified in 2024.

Inspections

- Site
- Post-burn
- OSDF
- Trails



Inspection Finding [Number of Findings]

- Noxious or Invasive Species [407]
- Animal Burrow [4]
- Debris [1]
- Bare Area [1]
- Erosion [1]
- Sign [1]
- Trash [0]
- Drainage [0]
- Rock Greater than 4 Inches [0]
- Fence [0]
- Structure [0]
- Unauthorized Use [0]
- Resolved Finding

--- Fernald Preserve Boundary

--- Intermittent Stream

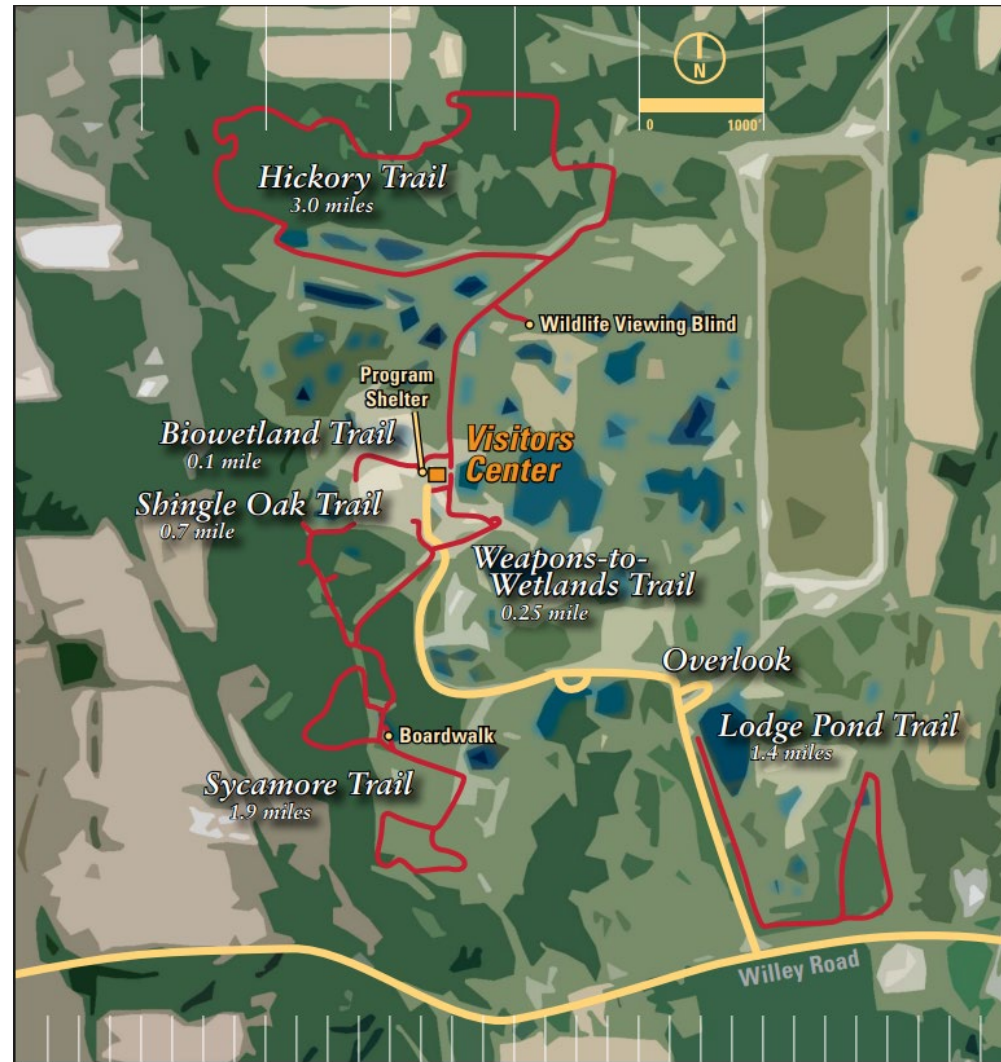
--- Fence

■ Building



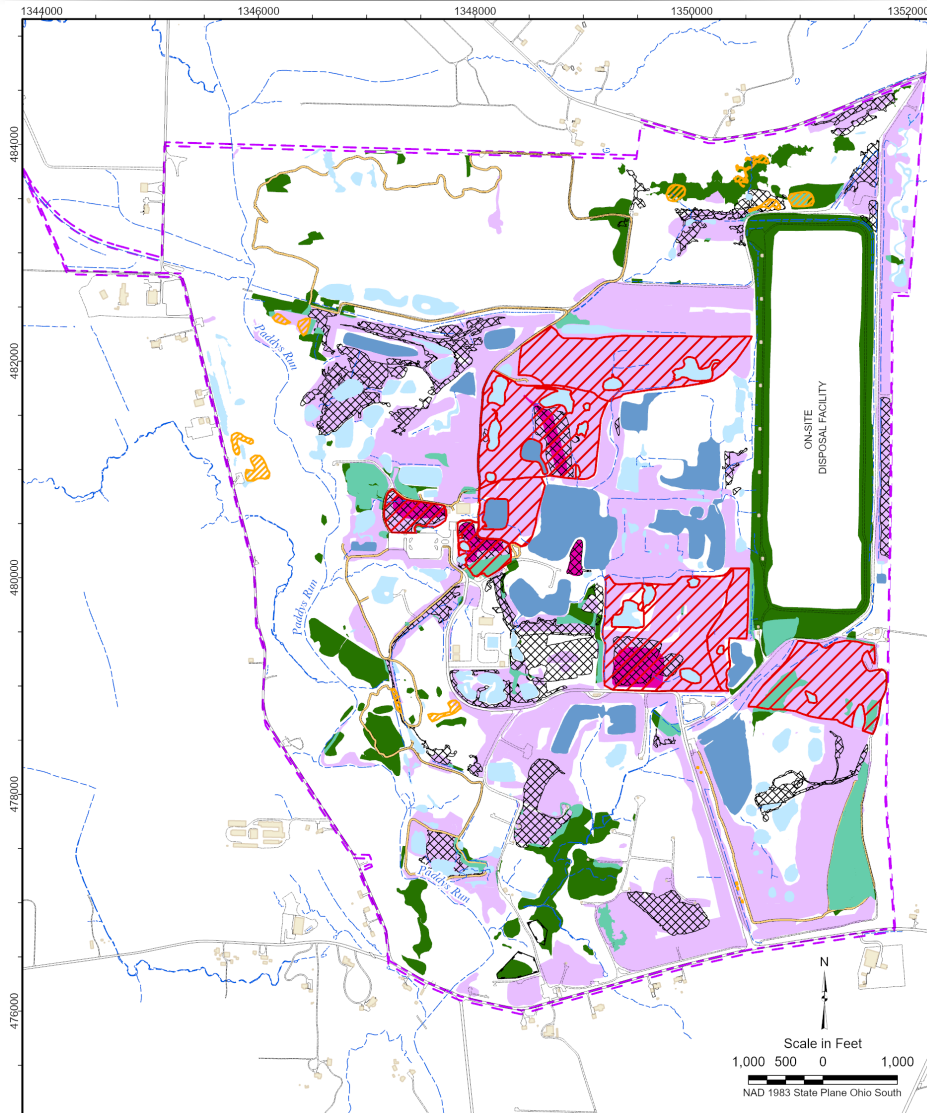
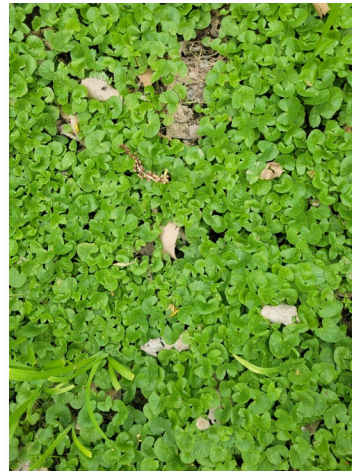
Inspections

- Site
- Post-burn
- OSDF
- Trails



Restored Area Maintenance

- Vegetation management
- Inspection follow-up



--- Fernald Preserve Boundary
 — Recreational Trail
 - - Intermittent Stream
 — Deer Fence Removed
 Wetland
 Open Water

Mowed Areas
 Tree Planting
 Seeding
 Herbaceous Vegetation Treatment
 Woody Vegetation Removal or Treatment

Herbaceous and Woody Vegetation Treatment
 Prescribed Burn Area



Ecological Monitoring

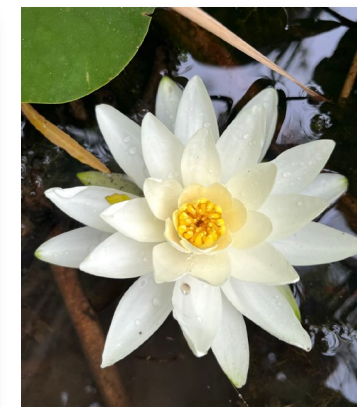
- Wetland floristic inventories
- OSDF vegetation cover



Cardinal flower



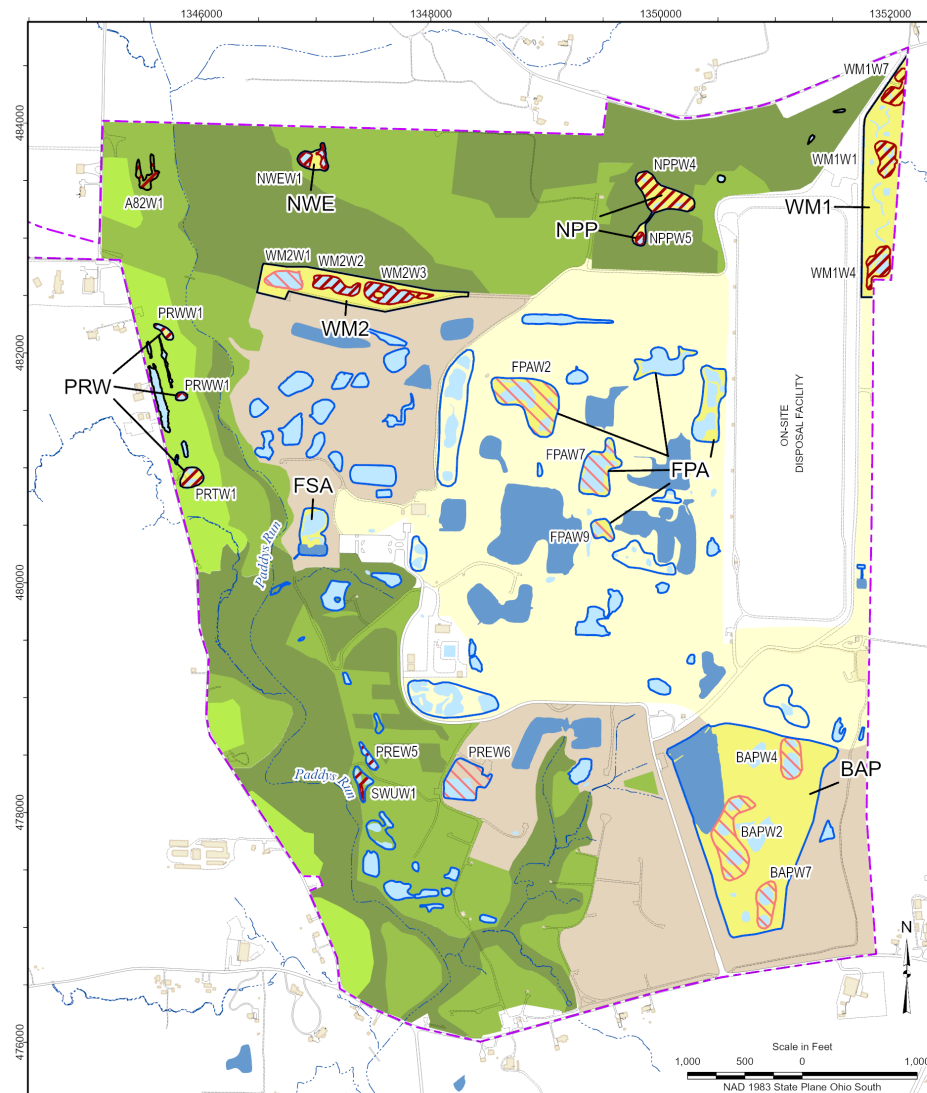
Southern blueflag iris



Fragrant water lily



OSDF vegetation monitoring plot



- Remediation Wetland Area
- Perimeter Wetland Area
- 2024 Amphibian Monitoring Area
- Former Amphibian Monitoring Area

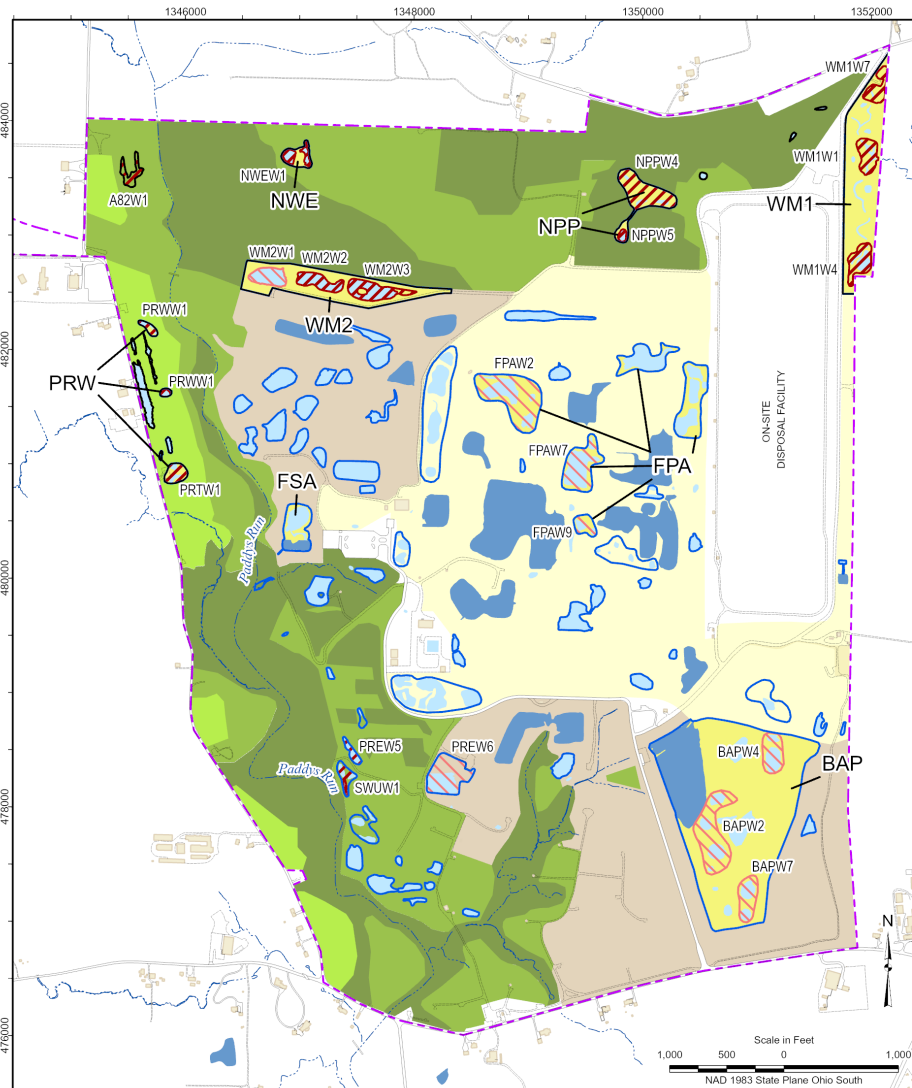
- Open Water
- Wetland Basin
- Fernald Preserve Boundary
- Intermittent Stream
- Wetland Vegetation Monitoring Area

- Remediation Prairie Area
- Remediation Successional Area
- Existing Forest Area
- Restoration Forest Area
- Perimeter Successional Area



Ecological Monitoring

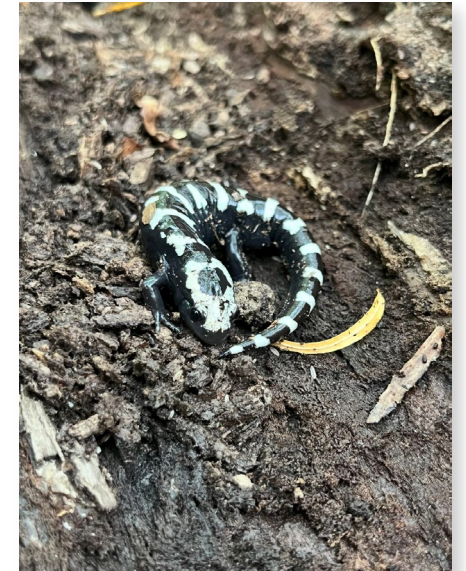
■ Amphibian Monitoring



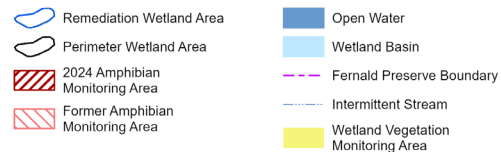
Amphibian traps



Spotted salamanders



Marbled salamander



New Site Flora Recordings

New species identified by
casual observation



Seedbox



Sweet marsh sedge
(Shoreline sedge)



**Sweet water
speedwell**



**Southern
wapato**



**Crane fly
orchid**



**Rough
blazing star**



**Summer
grape**



New Site Fauna Recordings



Eastern milk snake



Slender baskettail



Red-necked phalarope



Northern shrike

Photo not taken at Fernald



Shadow darter

Photo not taken at Fernald

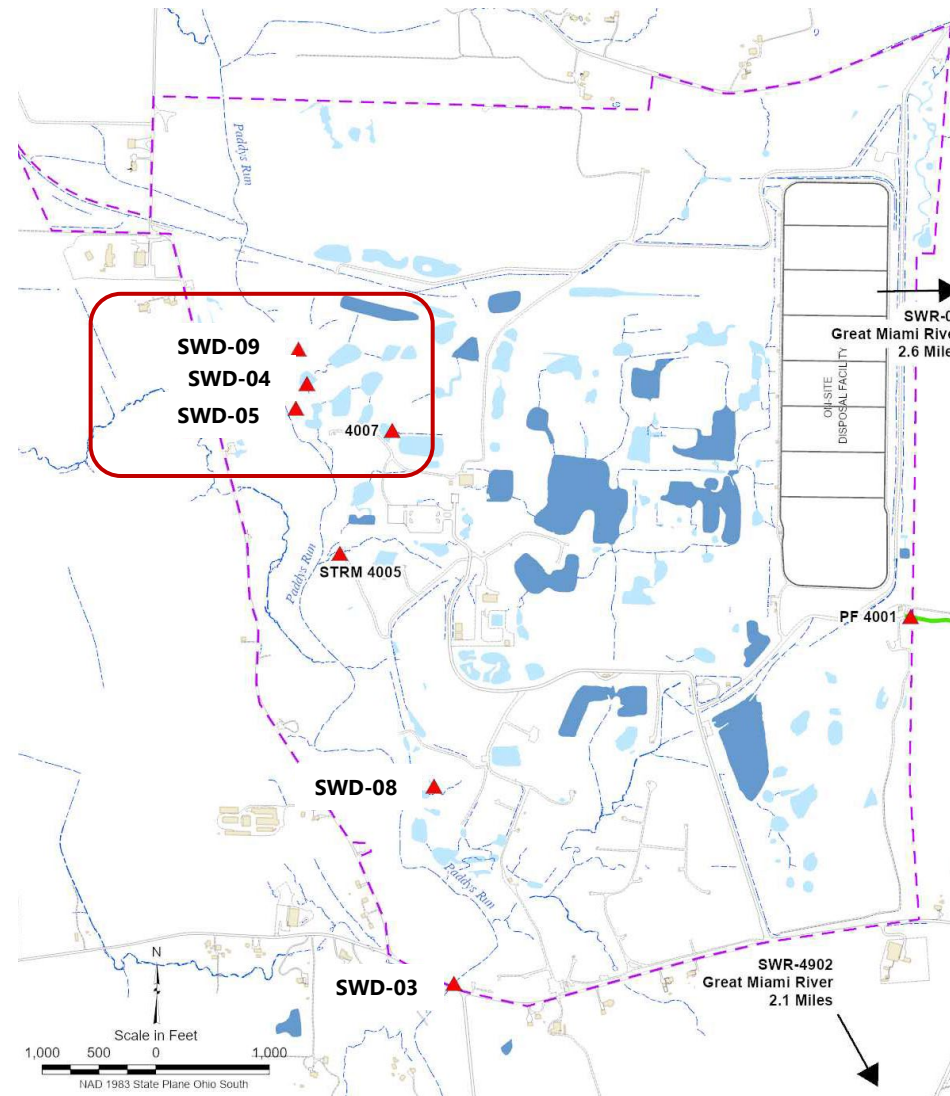




Monitoring

- Surface water sampling at nine locations
- Site effluent sampling at one location
- OSDF leak detection monitoring at 42 locations
- Groundwater monitoring at 91 wells
- Groundwater level monitoring at 177 wells

Surface Water



SWD-09

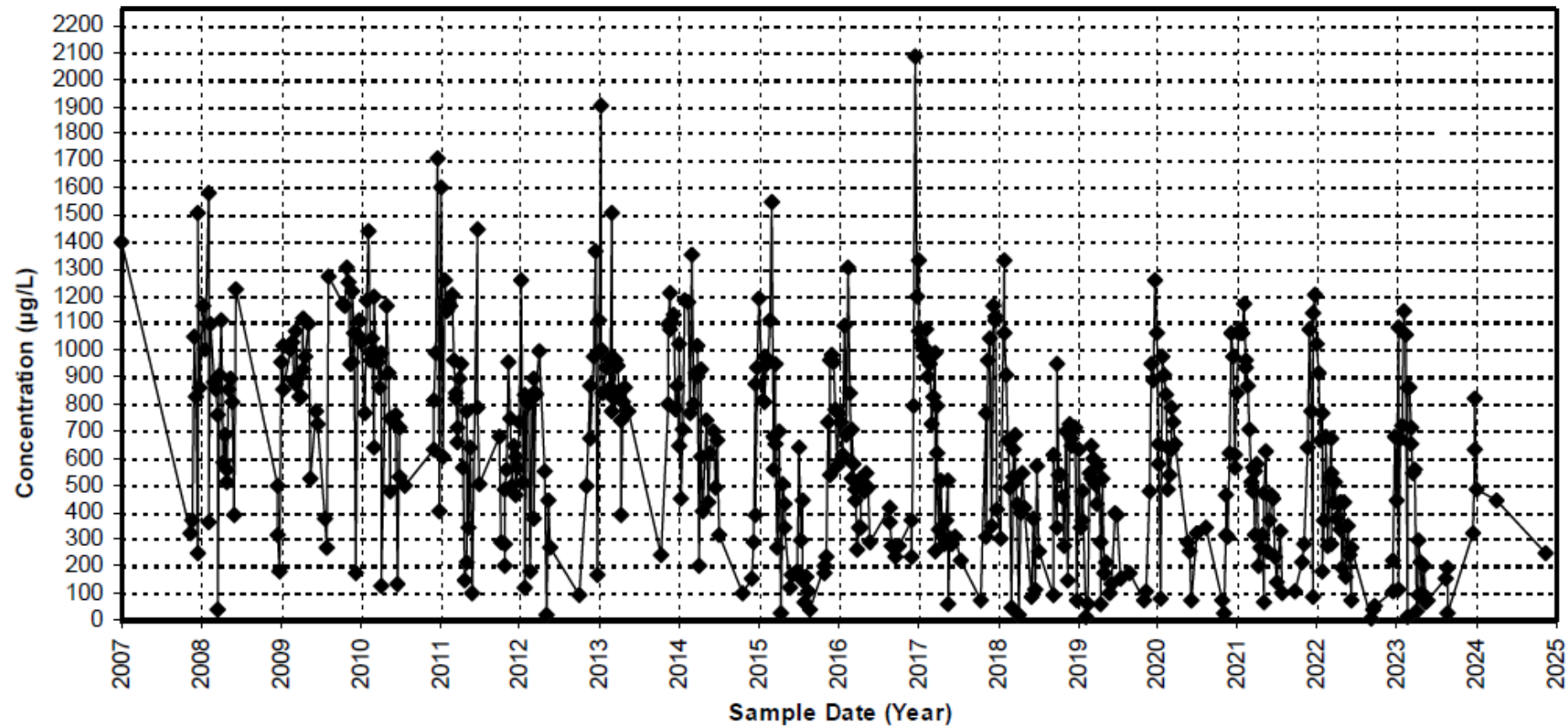


Figure B-2. Total Uranium Concentration vs. Time Plot
for Location SWD-09 (Former Waste Storage Area)

SWD-05

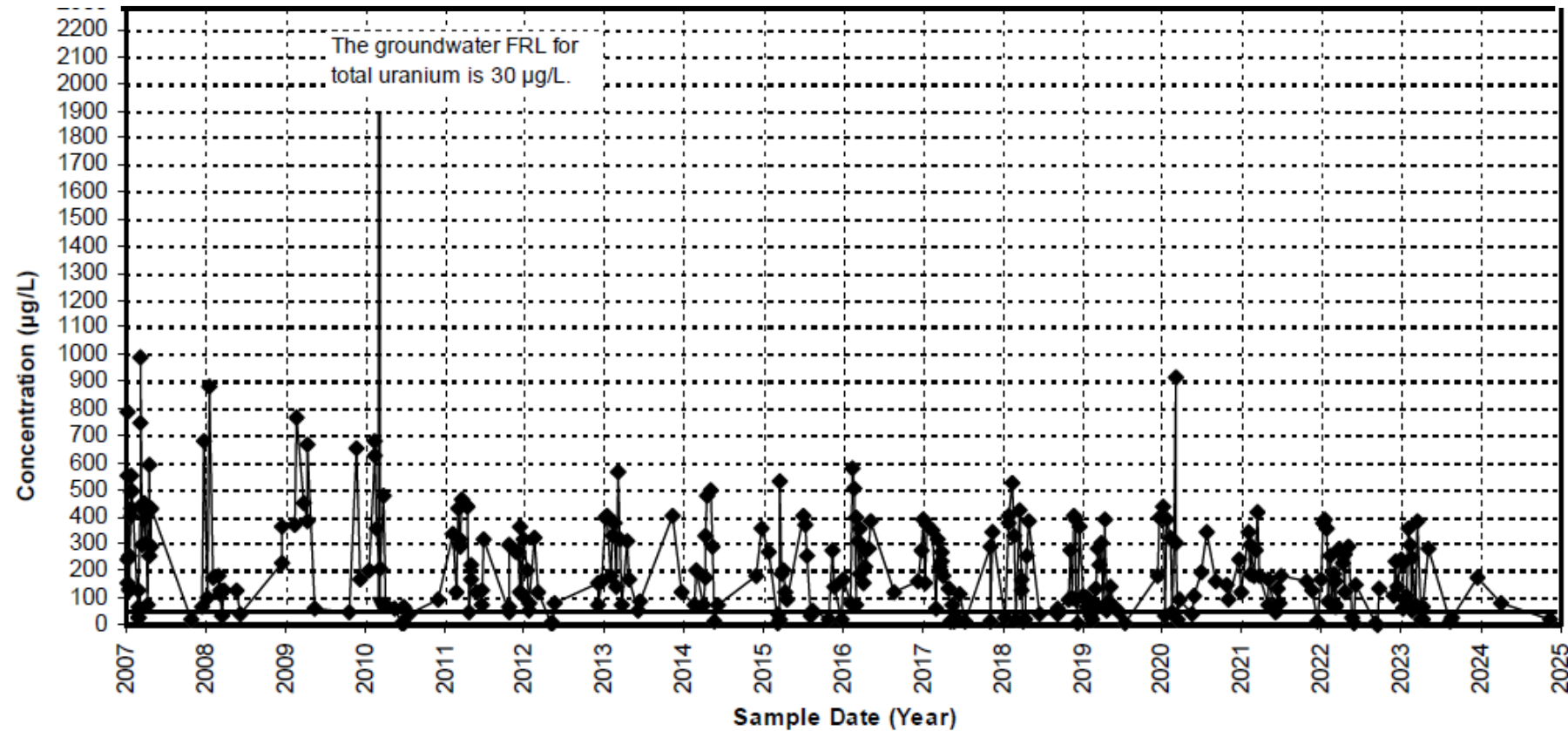
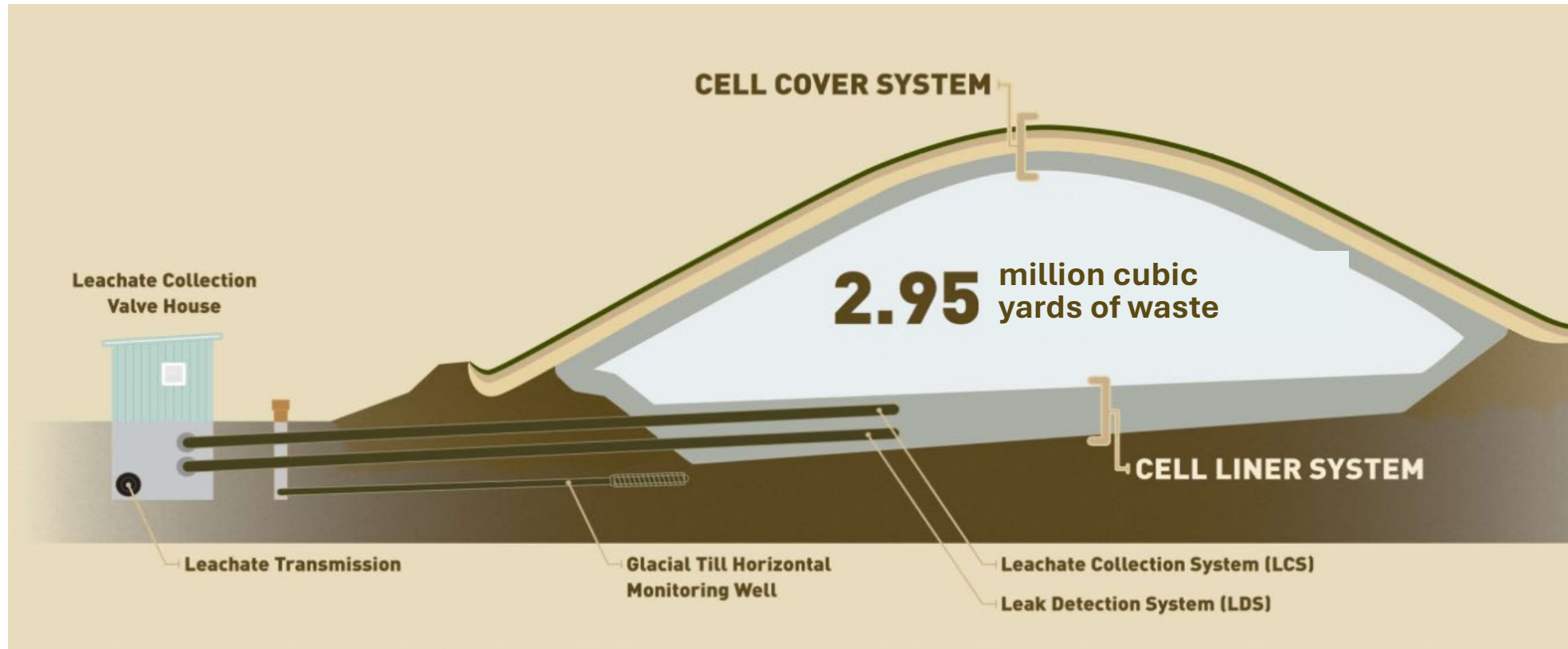


Figure B-5. Total Uranium Concentration vs. Time Plot
for Location SWD-05 (Former Waste Storage Area) for Cross-Media Impact Evaluation

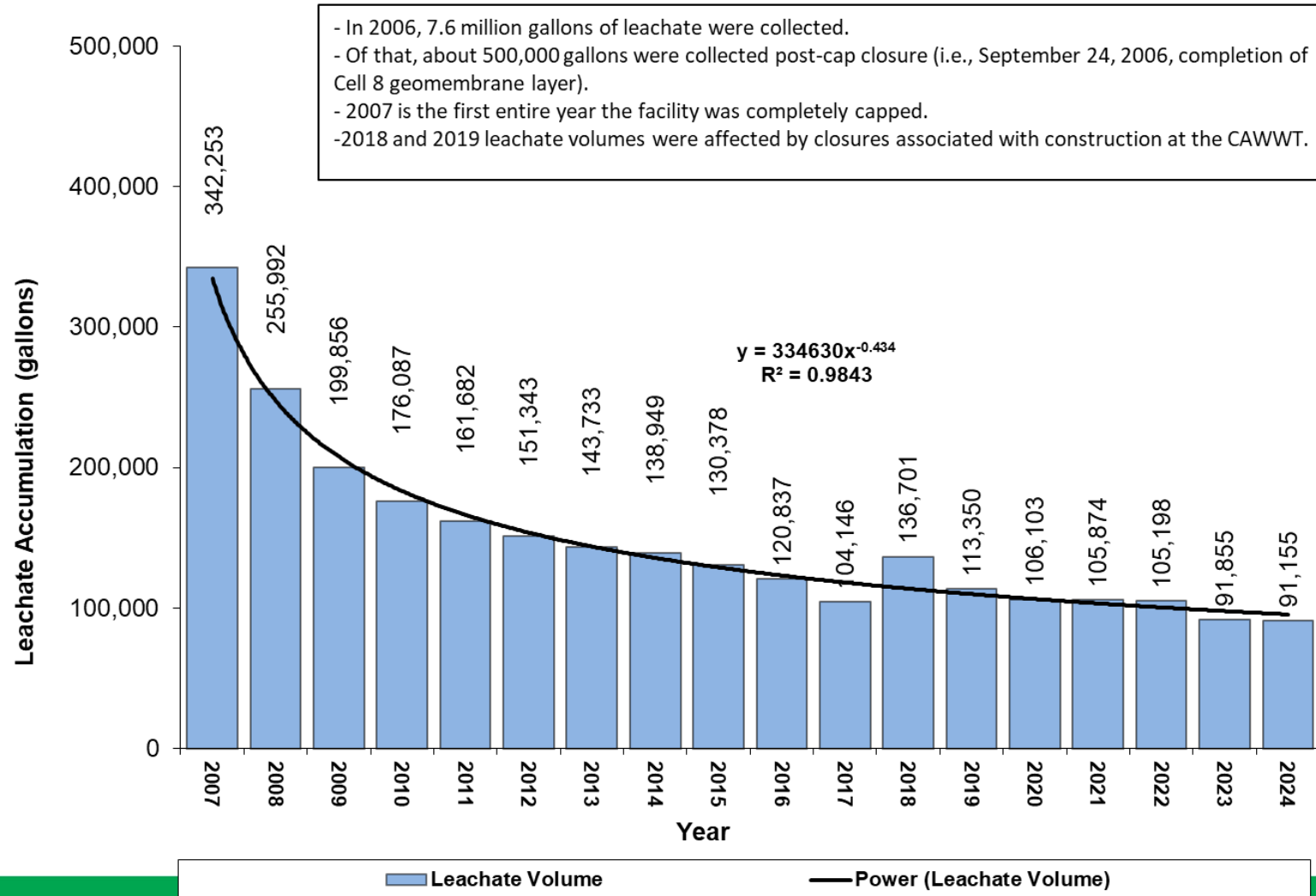
On-Site Disposal Facility



Leachate Collection System



Leachate Collection System - Annual Flow



LDS Flow Response Rates

Year	Cell	Maximum Accumulation Rate (gpad)	Maximum Flow Rate (gpd)
2020	6	0.32	1.60
2021	6	0.15	1.0
2022	4	0.00086	0.006
2023	6	0.00465	0.03
2024	6	0.0114	0.07

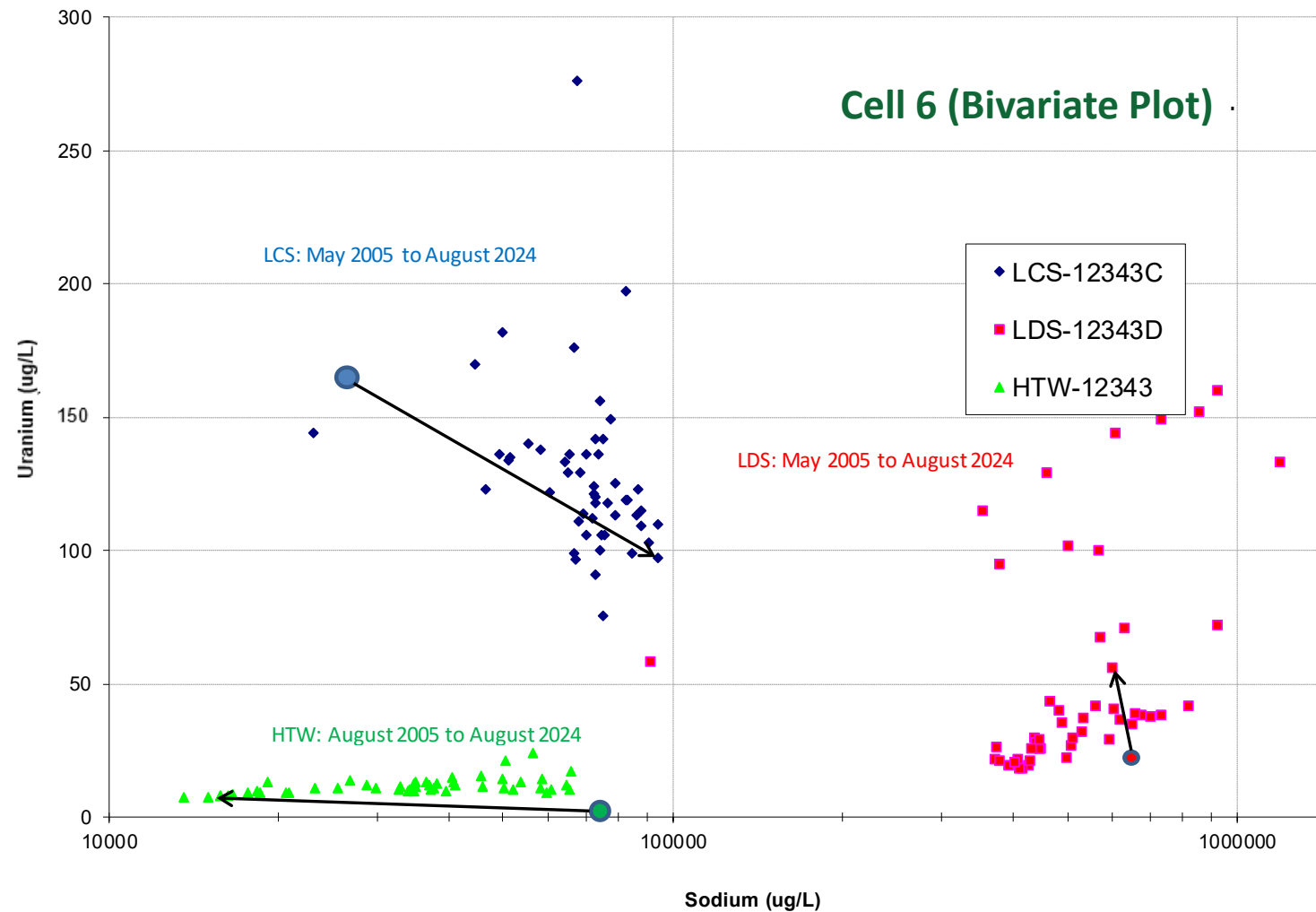
Action leakage rate	200 gpad	1,300-1,900 gpd
Initial response leakage rate	20 gpad	130-190 gpd
Low response leakage rate	2 gpad	13-19 gpd

gpad — gallons per acre per day

gpd — gallons per day



Uranium Versus Sodium Concentrations



Performance: 2024

- No indication of leaks from any of the disposal cells
- Only Cell 6 LDS had enough water to sample in 2024
- Highest recorded flow in leak detection system was in Cell 6 at 0.0114 gpad
 - Low-flow response leakage rate: 2 gpad
 - Initial response leakage rate: 20 gpad
 - Action leakage rate: 200 gpad
- The trend in leachate collection system volumes matches the historical trend, indicating the cell cap is functioning as designed
- Leachate collection system and leak detection system accumulation rates indicate the liner systems are performing as designed
- Water-quality trends in the horizontal till wells and the Great Miami Aquifer (GMA) wells indicate concentration fluctuations beneath the facility are not related to facility performance
- No visual signs of compromised cap integrity



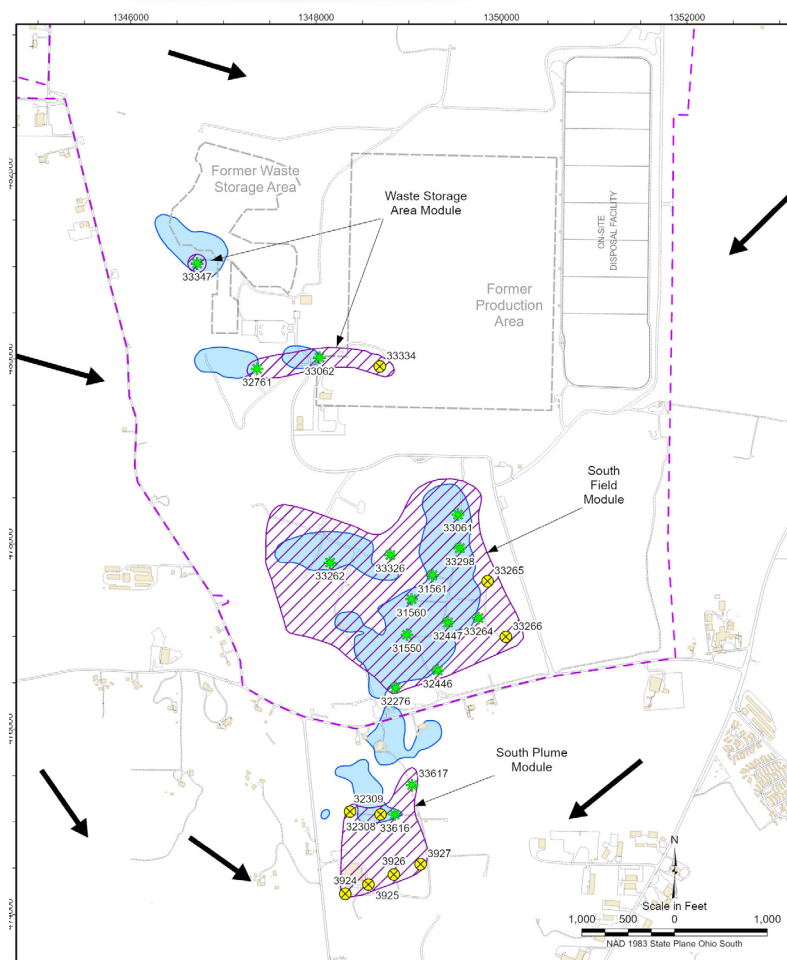
System Overview

■ Remediation system is organized into modules:

- South Plume Module
- South Field Module
- Waste Storage Area Module

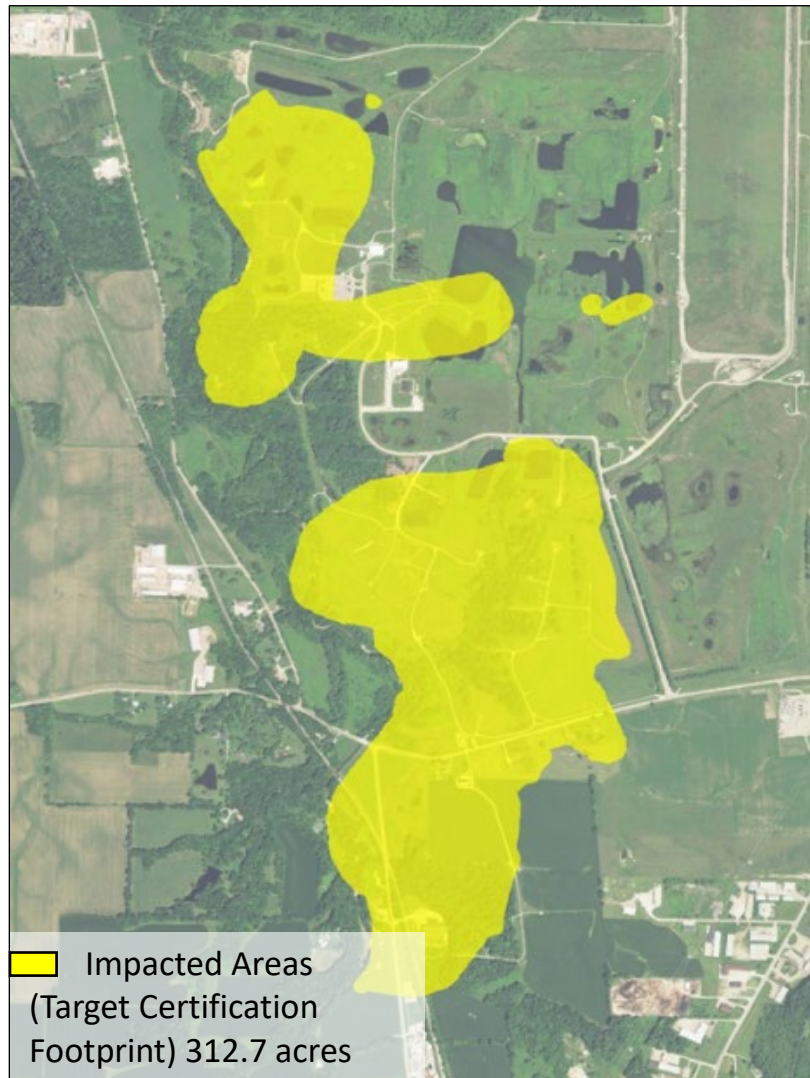
■ Remediation objectives:

- Concentration-based cleanup to final remediation levels
- Limit further expansion of the plume
- Prevent undesirable groundwater drawdown beyond the site boundary
- Clean up off-property portions of the plume first
- Limit impact to private property



- ★ Active Extraction Well
- ★ Inactive Extraction Well
- Regional Groundwater Flow Direction
- ▨ Current Active Module
- Total Uranium Plume Greater Than or Equal to 30 µg/L Footprint for 2024



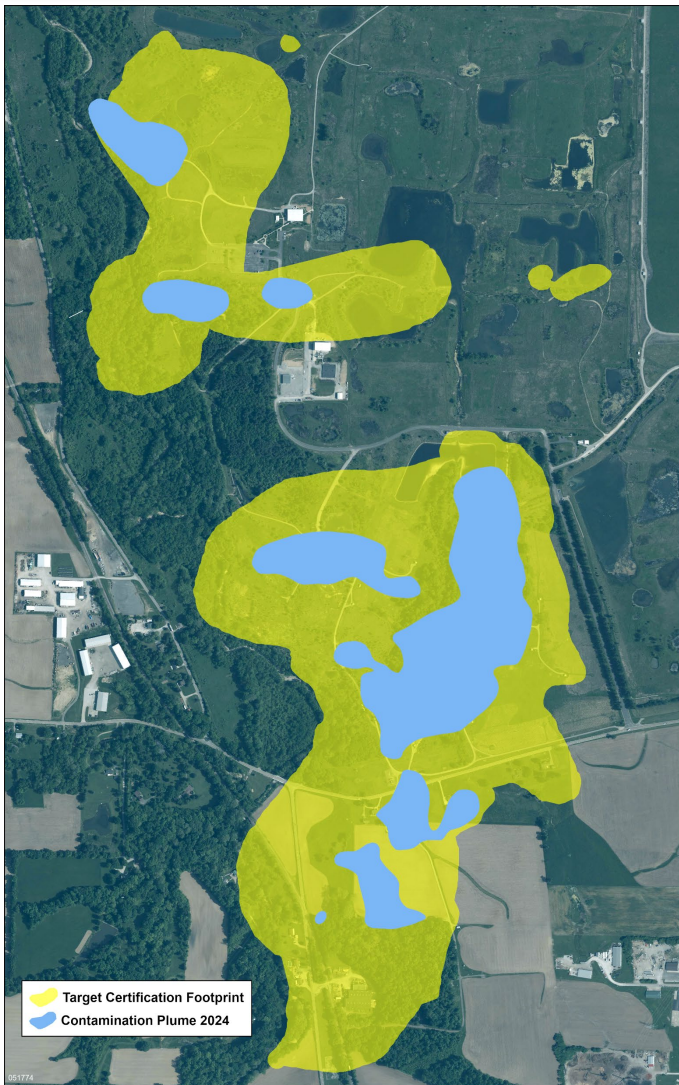


Operable Unit 5 Record of Decision

- OU5 (Operable Unit 5) Record of Decision (ROD) formally defines the selected groundwater remedy and establishes final remediation levels (FRL) for 50 constituents of concern
- Selected groundwater remedy: impacted areas of GMA exceeding FRLs will be restored through extraction methods
- OU5 ROD commits to an ongoing evaluation of innovative remediation technologies so that we can improve remedy performance as new technologies become available
- Final number and configuration of extraction wells were established during remedial design



Current Remediation Status



Between 2006 and 2024, the uranium plume area decreased from 189.3 to 69.4 acres.

Year	Remaining size (acres) of the maximum uranium plume within the target certification footprint
2006	189.3
2007	186.0
2008	186.9
2009	186.0
2010	184.0
2011	144.3
2012	130.3
2013	127.3
2014	110.9
2015	109.5
2016	105.0
2017	94.4
2018	89.3
2019	86.5
2020	81.5
2021	75.0
2022	74.0
2023	72.1
2024	69.4



Groundwater Remedy: Remedial Design

- **Groundwater remedy evolved through a series of progressive remedial designs:**
 - **1995** — Feasibility Study Report for Operable Unit 5
 - **1997** — Baseline Remedial Strategy Report, Remedial Design for Aquifer Restoration (Task 1)
 - **2001** — Design for Remediation of the Great Miami Aquifer in the Waste Storage and Plant 6 areas
 - **2002** — Design for Remediation of the Great Miami Aquifer, South Field (Phase II) Module
 - **2003** — Comprehensive Groundwater Strategy Report
 - **2005** — Waste Storage Area Phase II Design Report
- **Optimization:**
 - **2014** — Operational Design Adjustments — 1 WSA Phase II Groundwater Remediation Design
 - **2024** — Update using uranium plume concentrations from 2021



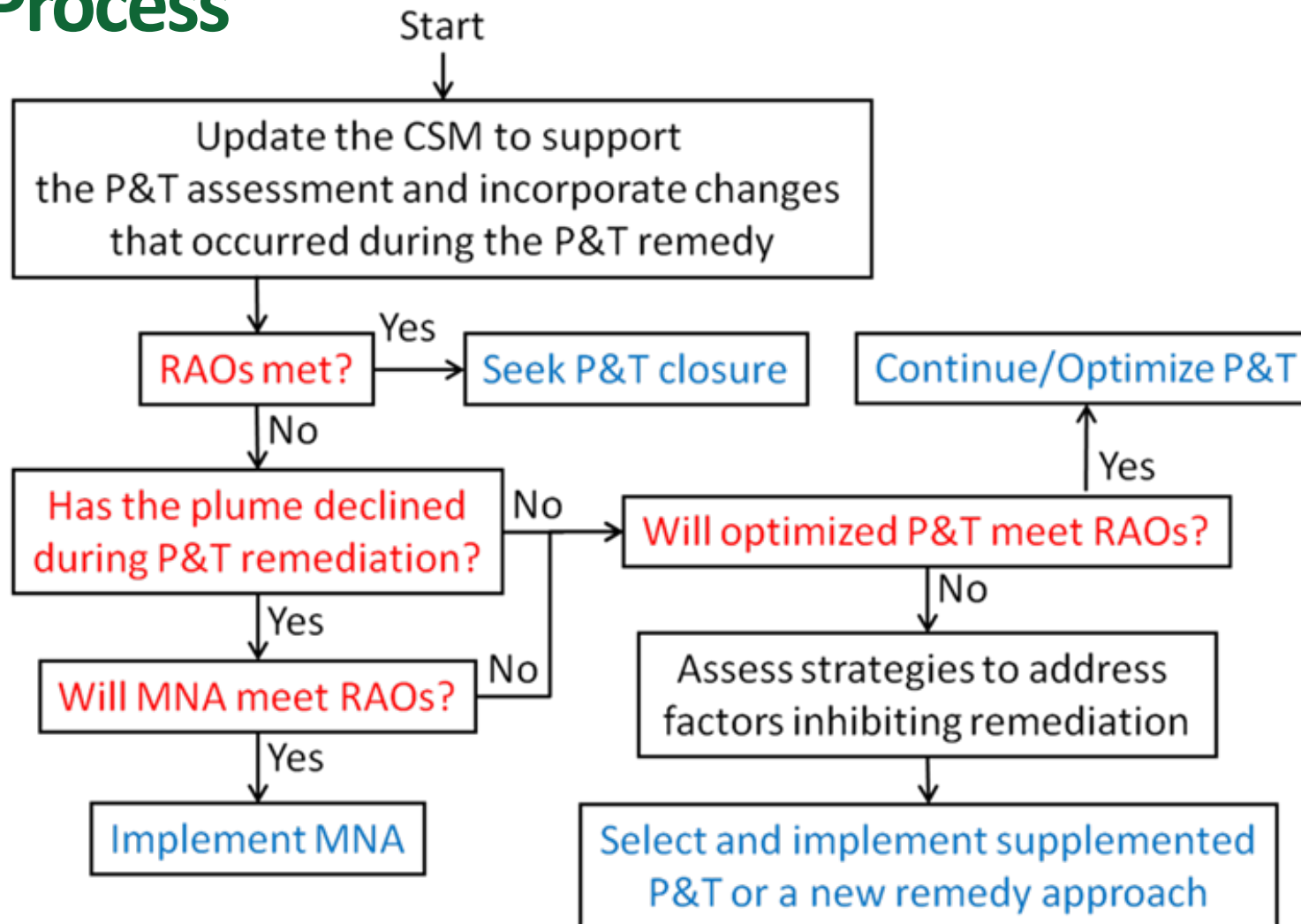
Optimizations Since 2005

2005 Remedy Design — Revised Cleanup Evaluation

- 2005 design-predicted cleanup dates
 - South Plume: 2015
 - South Field: 2022
 - Waste Storage Area: 2023
- Revised cleanup predictions based on 2011 plume resulted in 2014 optimization
 - South Plume: 2021 (6 years longer)
 - South Field: 2028 (6 years longer)
 - Waste Storage Area: 2032 (9 years longer)
- Revised cleanup predictions based on 2021 plume resulted in 2024 optimization
 - South Plume: 2025 (4 years longer) **2028 operationally**
 - South Field: 2038 (10 years longer) **2041 operationally**
 - Waste Storage Area: 2045 (13 years longer) **2048 operationally**

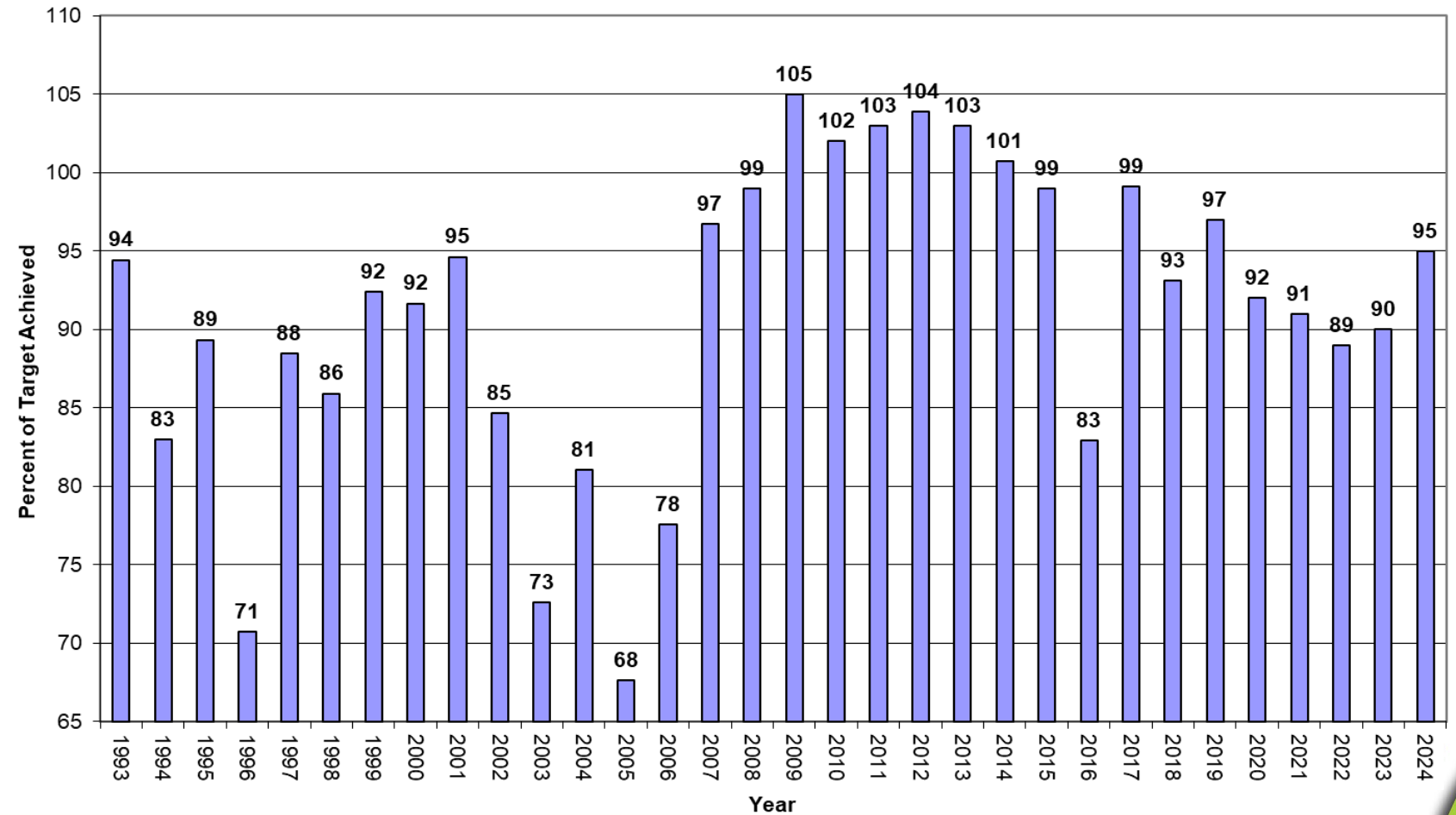


Optimization Process



Percent of Target Achieved

Percent of Target Achieved
Billions of Gallons Pumped (Actual versus Target)
1993 - 2024



Iron Fouling of Extraction Wells



Pipe Cleaning



Hydrojet



Discharge to backwash
basin

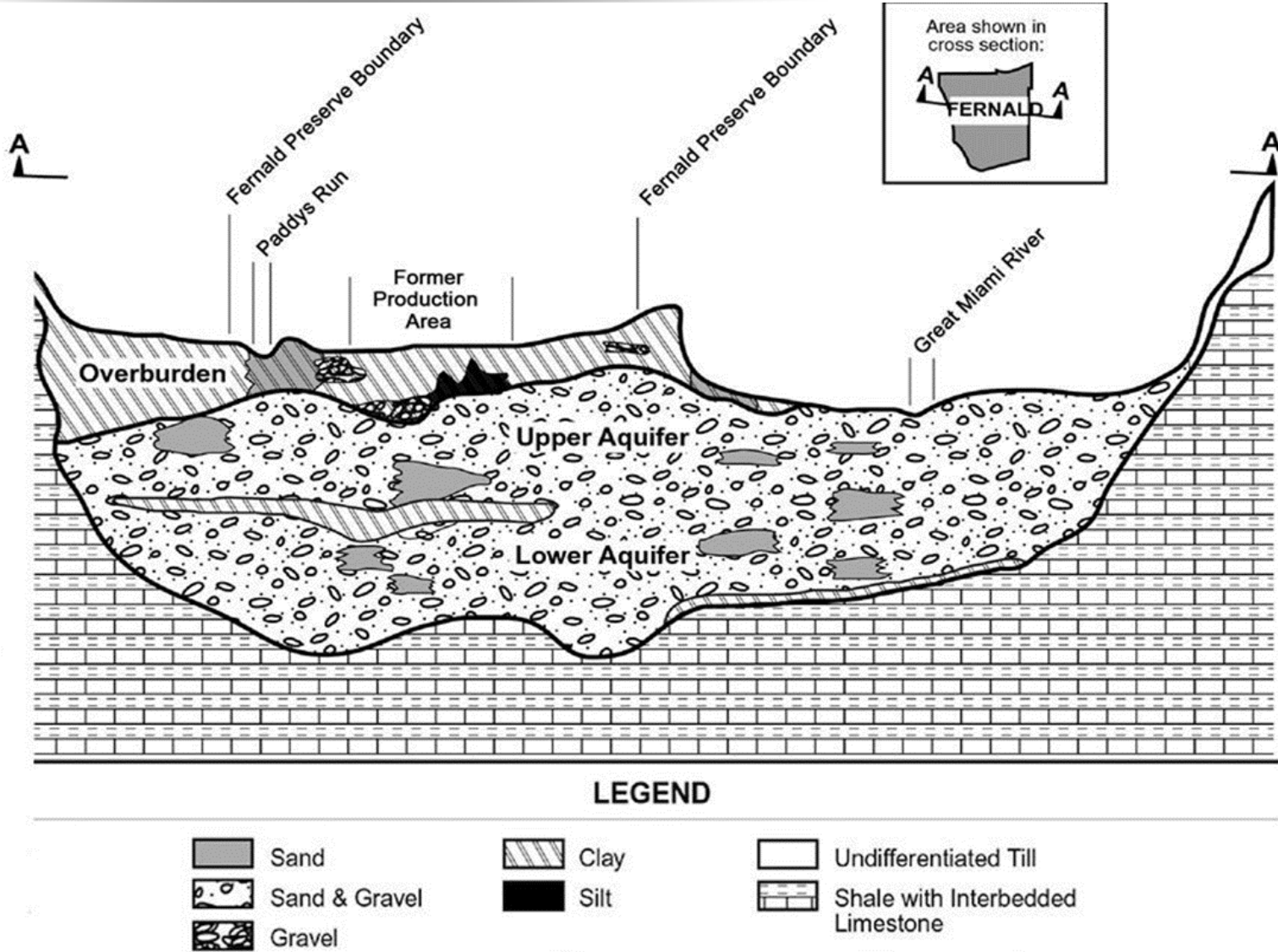


Before Cleaning

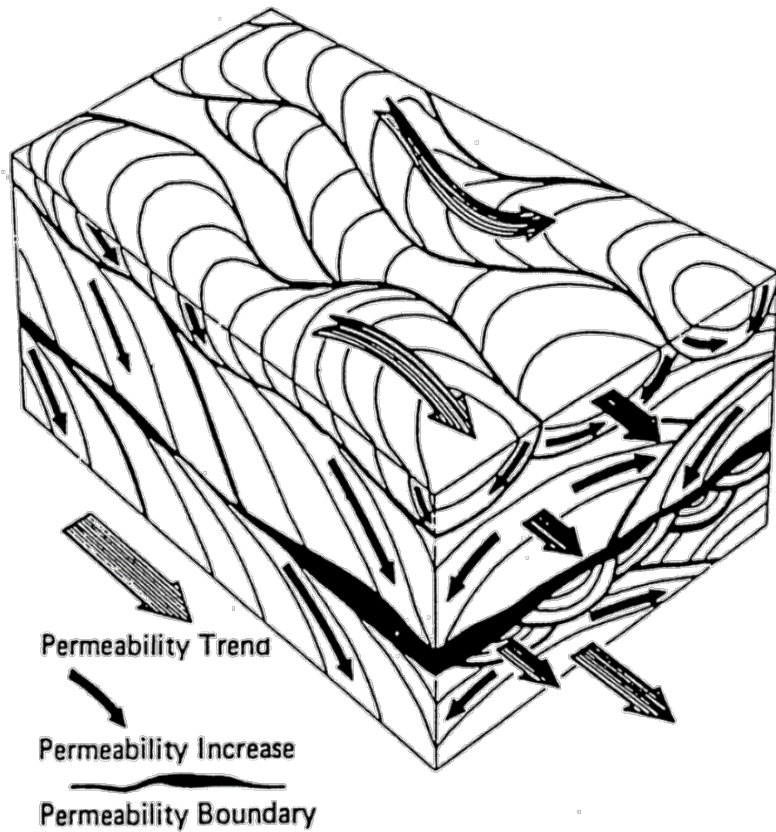


After Cleaning

Groundwater Remedy

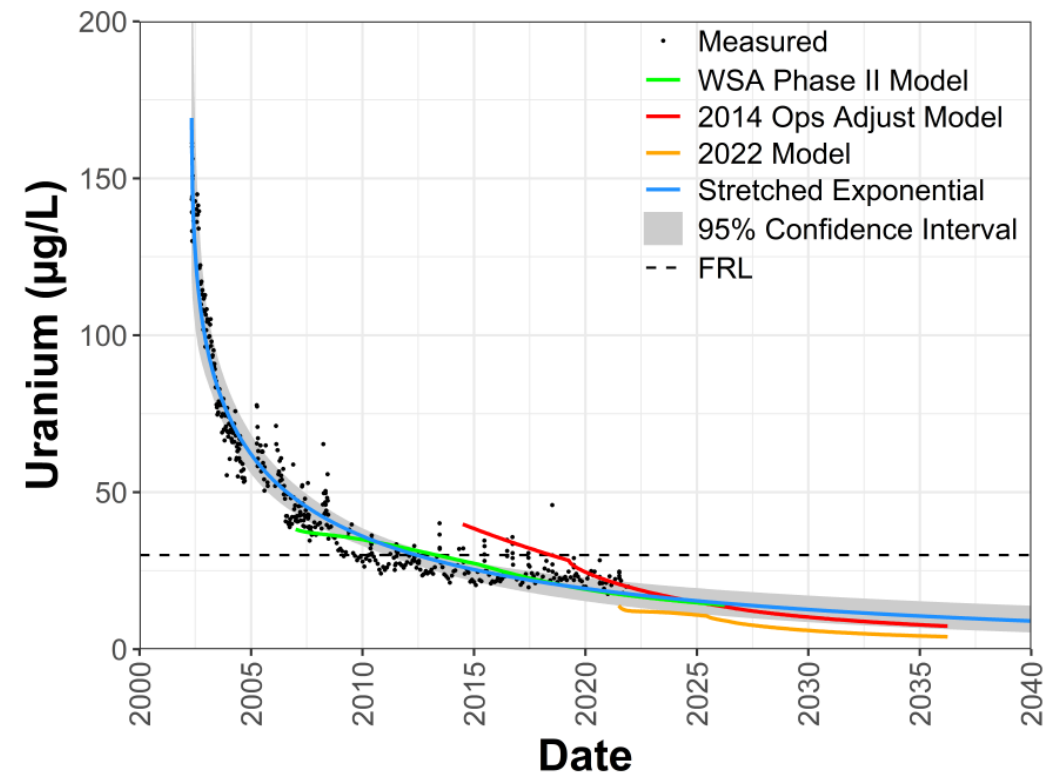
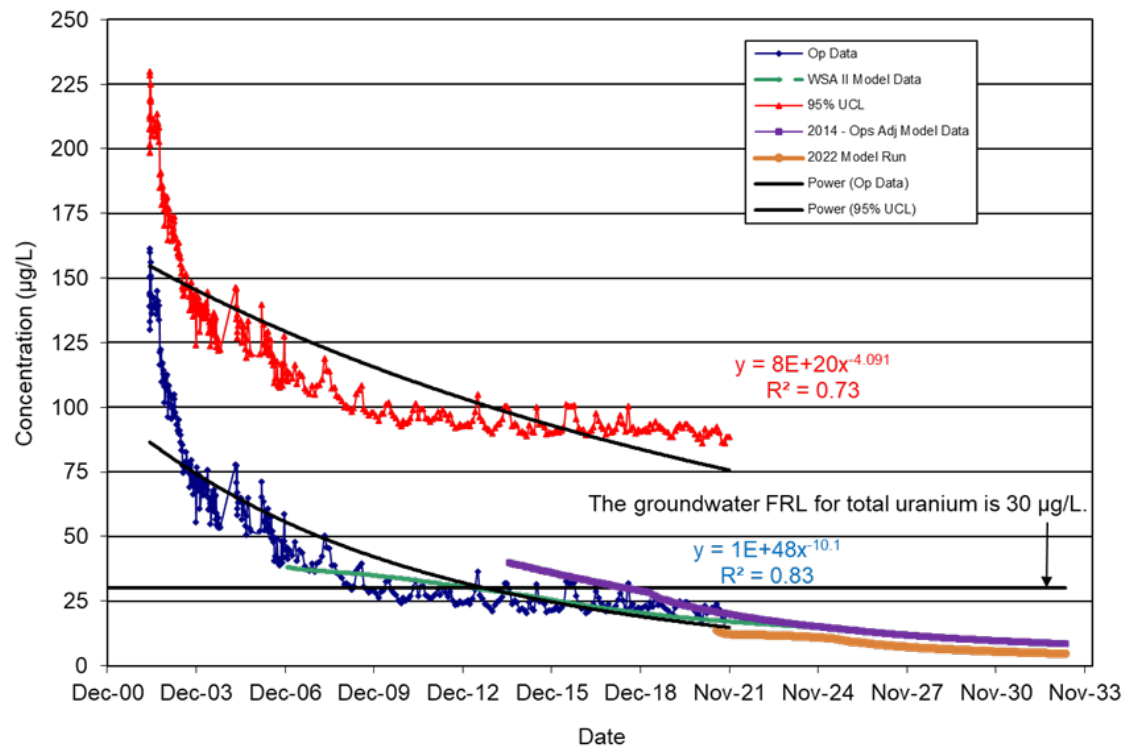


Hydrologic Background



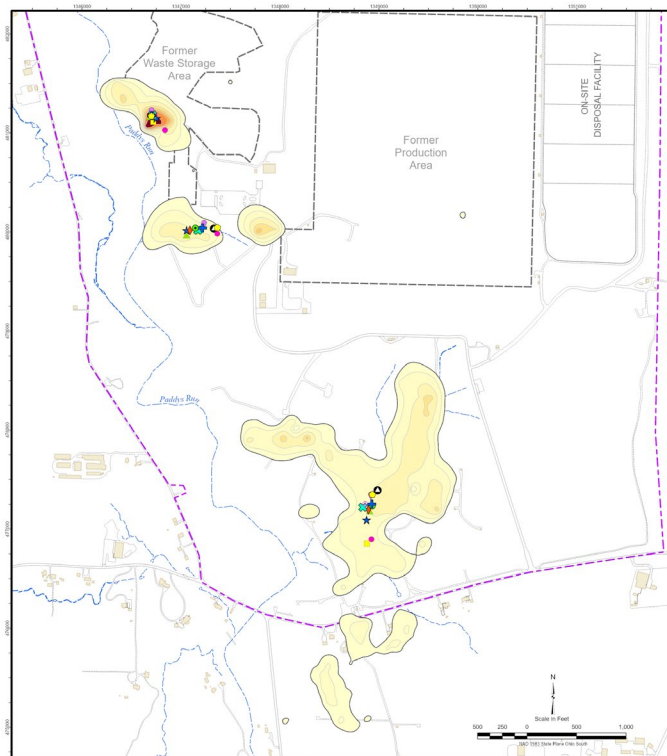
NLN Recommendations Completed

Use of Stretched Exponential Equations



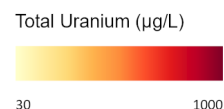
Center of Mass Interpretations

Ricker Method 2024 Center of Mass

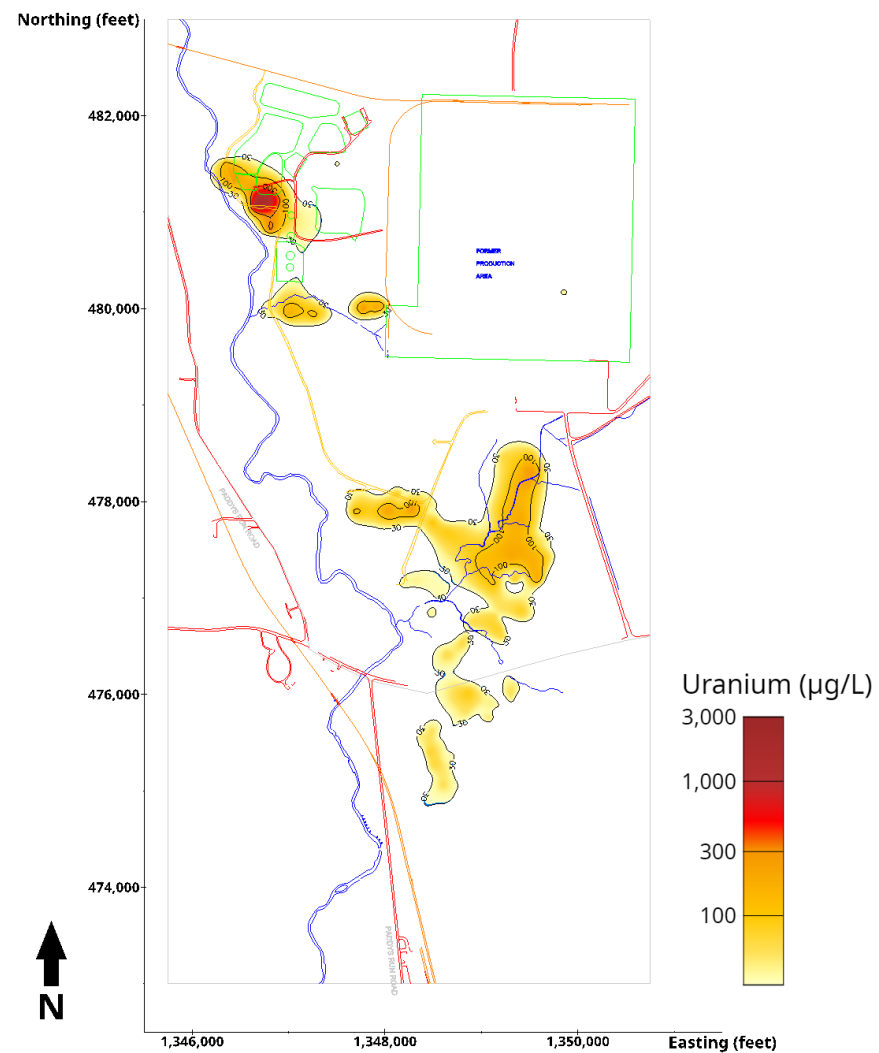


Center Of Mass

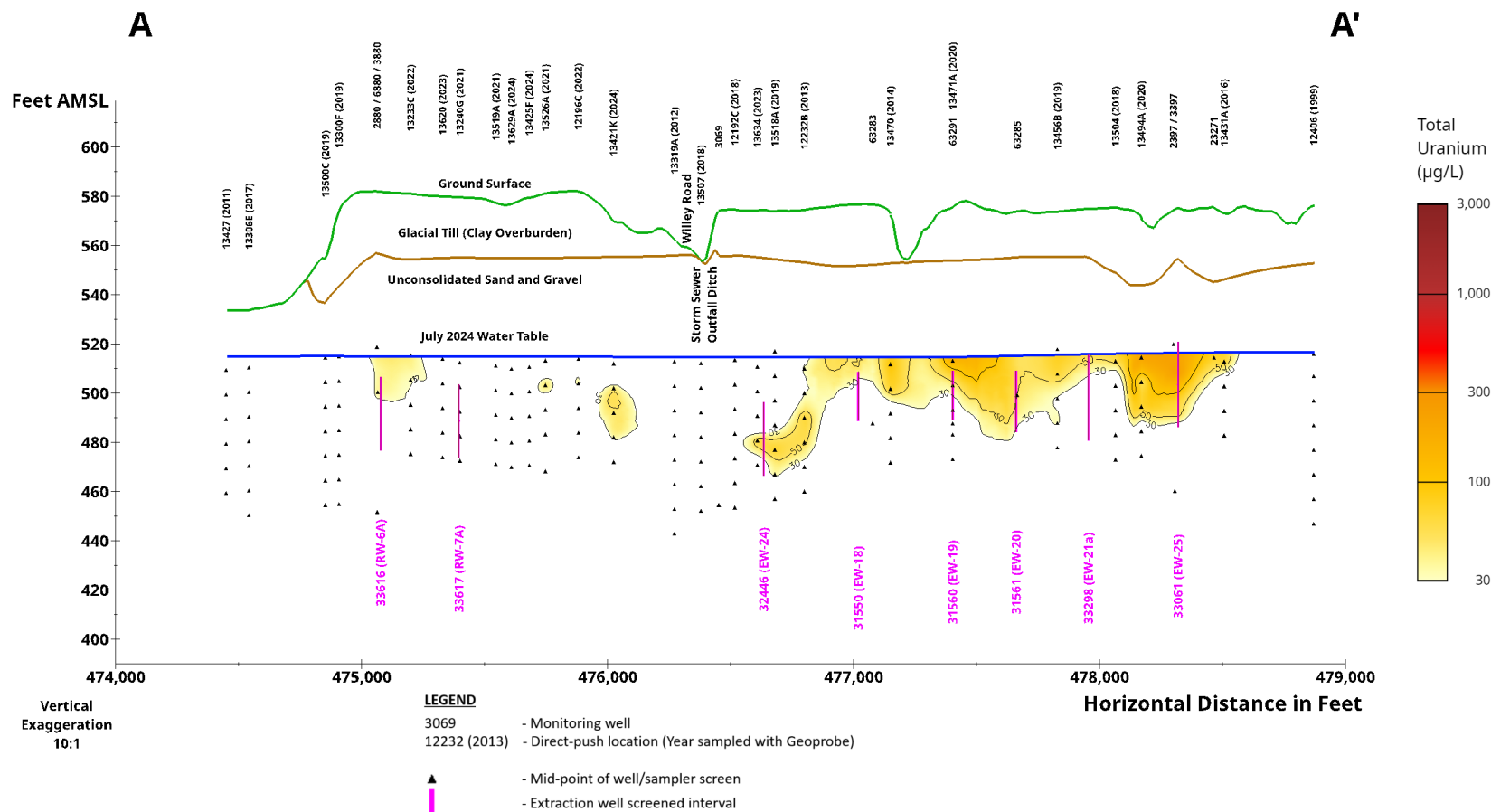
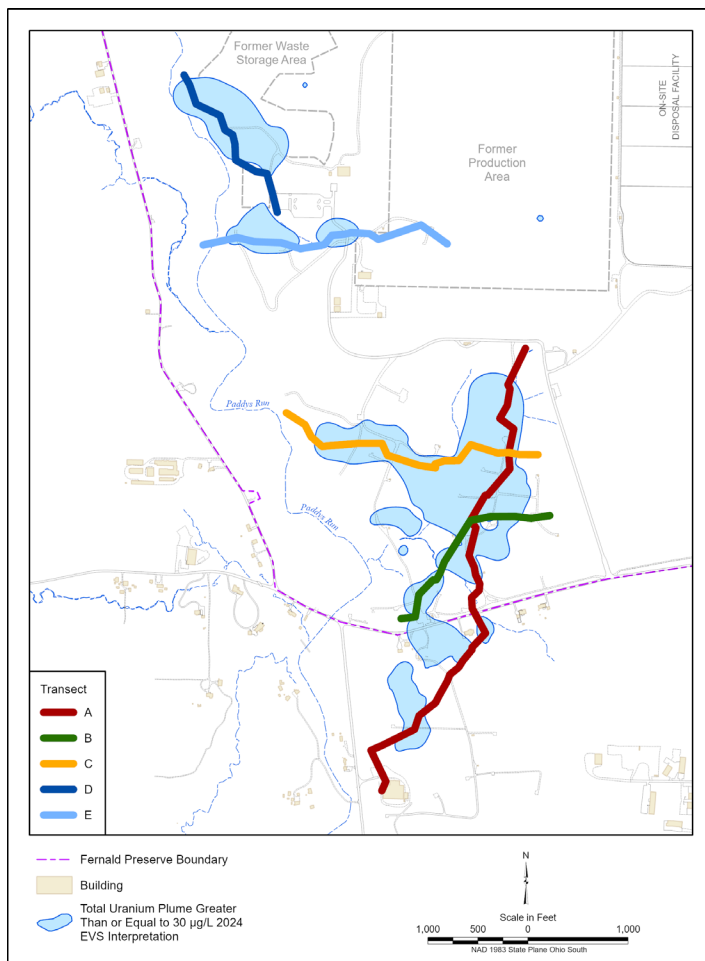
Year	Symbol
2024	Black circle
2023	Yellow pentagon
2022	Blue plus
2021	Purple diamond
2020	Green circle
2019	Pink plus
2018	Teal cross
2017	Orange diamond
2016	Blue star
2014	Green triangle
2010	Yellow square
2006	Pink circle



EVS 2024 Plume Interpretation



3D Visualizations Using Earth Volumetric Studio Software

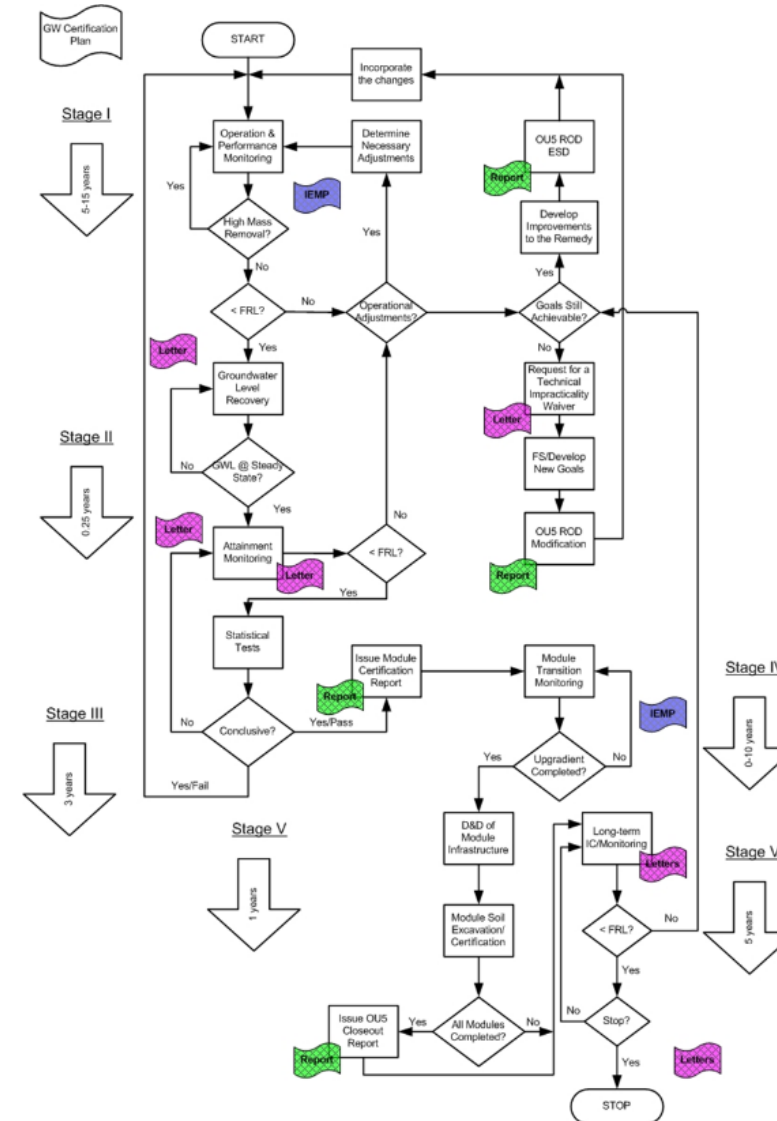


Red Cross Section Trace

Groundwater Remedy Certification Process

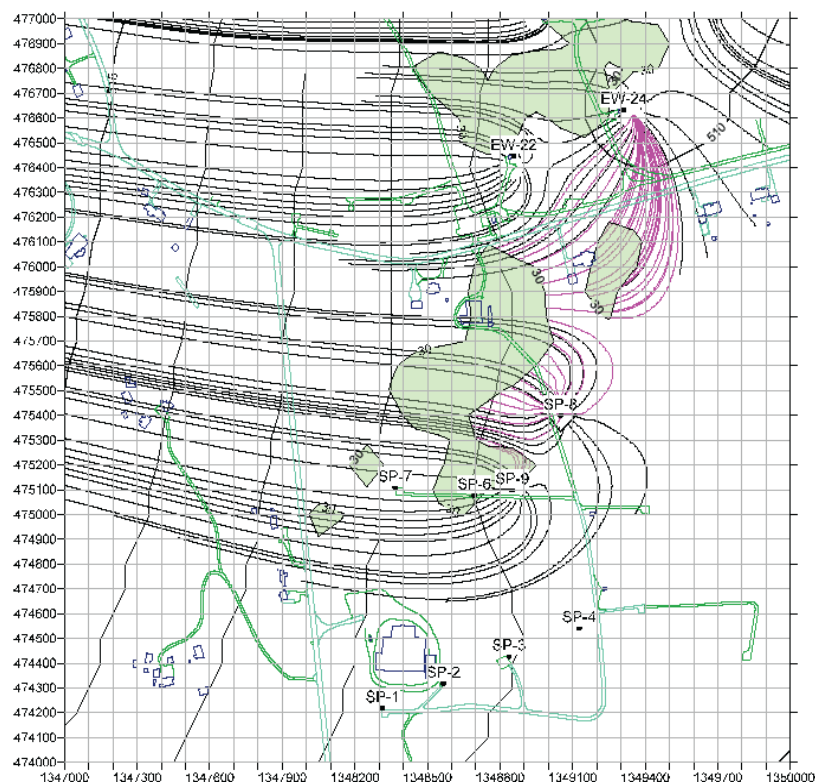
- Groundwater Certification Process
 - Stage I: Pump-and-treat (P&T) operations
 - Stage II: Post-P&T operations/hydraulic equilibrium state
 - Stage III: Certification/attainment monitoring
 - Stage IV: Declaration and transition monitoring
 - Stage V: Demobilization
 - Stage VI: Long-term monitoring

DOE (2006), Fernald Groundwater Certification Plan, Revision 2, Final



Path Forward

- Continue pumping
- Continue pursuing NLN modeling recommendations
- Evaluate optimizations in the South Field



Two New South Plume Wells 8 & 9 Pumping 300 gpm each
 S. Plume 8 (replaces 6) moved 2 model blocks (200') North and
 4 model blocks (400') East
 S. Plume 9 (replaces 7) moved 5 model blocks (500') East
 South Plume 1, 2, 3, 4, 6, & 7 Off
 Dry Boundary Conditions

— 10 Year Reverse Particle Tracks From Extraction Wells
 — 30 Year Forward Particle Tracks from 30 ug/L Plume Boundary

Image source: 2022 Groundwater Modeling Report, Fernald Preserve, Ohio, Site, Rev. 1



Interpretive Services

2024 by the Numbers

15,129 Interpretive Services Contacts

This includes on- and off-site programming, meeting room use, and tours

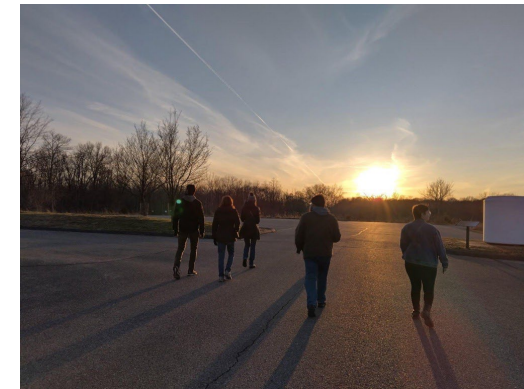
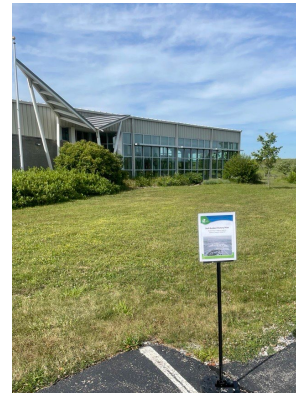
- 2023 contacts: 13,535
- 2022 contacts: 8,016

35,898 Vehicle Visitations

- 2023 vehicle count: 26,460
(No data from July-October)
- 2022 vehicle count: 33,050

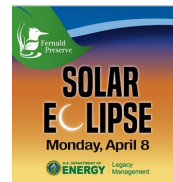
51,318 Pedestrians

- 2023 pedestrians: 51,514
- 2022 pedestrians: 55,079



Solar Eclipse April 2024

625 participants



Office of Legacy Management
April 10 · 🌐

The Fernald Preserve near Hamilton, Ohio, and the Weldon Spring Site in St. Charles, Missouri, had events for the 2024 solar eclipse on Monday, April 8. Both locations were in the path of totality with more than 600 attending at Fernald and more than 170 at Weldon Spring.

At Fernald, Cincinnati Astronomical Society members answered questions about the eclipse and Midwest Society of Acoustic Ecology members offered a "sound walk" so visitors could learn how the eclipse affects the sounds of nature. Both locations provided eclipse glasses and answered questions from the public. <https://bit.ly/49xOqmH>

It was also an opportunity to showcase the sites' histories and LM's mission of long-term stewardship. For more information on the Fernald Preserve and the Fernald Preserve Visitors Center, visit <https://bit.ly/43yhSc>. For more information on the Weldon Spring Site and the Weldon Spring Site Interpretive Center, visit <https://bit.ly/3gVF4eC>.

Photo 1: Visitors to the Fernald Preserve near Hamilton, Ohio, prepare for Monday's solar eclipse. More than 600 participated in the activities. More than 170 attended a similar event at the Weldon Spring Site in St. Charles, Missouri.

Photo 2: The sun eclipsed, photographed from the Fernald Preserve near Hamilton, Ohio, April 8.



Ashton Peterhans, Luree E Ketcham and 25 others

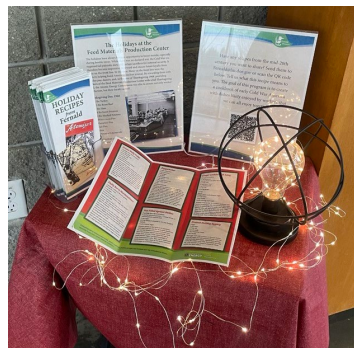
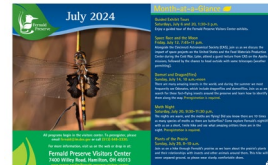
2 comments 3 shares

Like

Comment

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Additional 2024 Highlights



Community Stakeholder Groups

Fernald community members met with representatives from the DOE Environmental Management Site-Specific Advisory Board in May 2024. The meeting brought together Fernald community members and local citizens and staff from eight DOE-EM sites to discuss lessons learned and share strategies for successful long-term stewardship.

The community members were from Fernald Residents for Environmental Safety and Health (FRESH) and the Fernald Community Alliance (FCA).

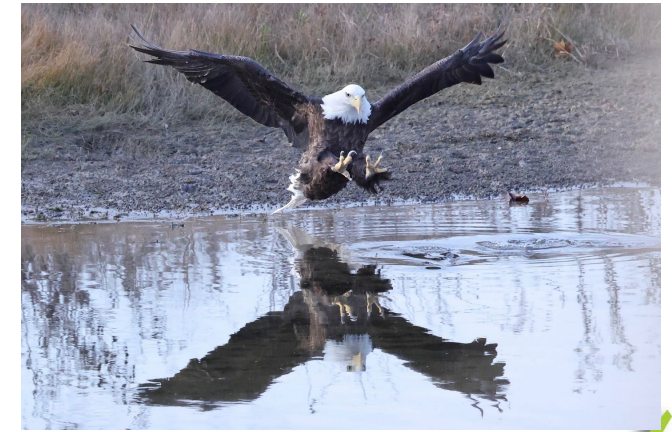
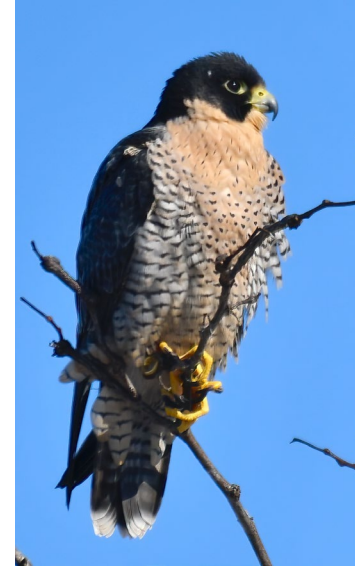
Fernald Community Alliance
www.fernaldcommunityalliance.org

We thank all members of FRESH and FCA for their continued support and involvement!



Visitor Wildlife Photos

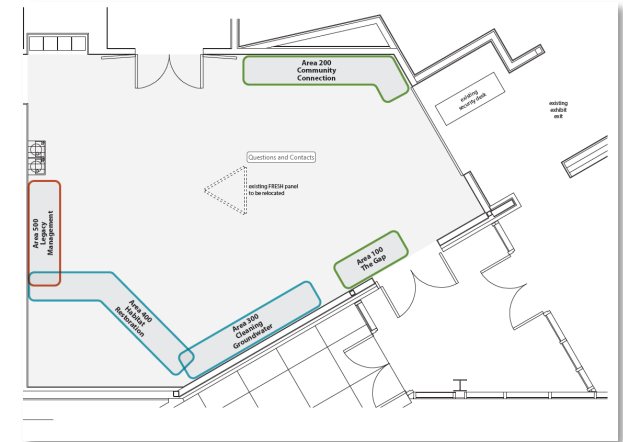
Birders and wildlife photographers are frequent guests



General Site Updates



Prepared by:
Elbe Creative Partners, Inc.
& Kraemer Design + Production



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Thank you for attending!