The U.S. Department of Energy (DOE) Office of Legacy Management (LM) 23rd public meeting on the Fernald Preserve, Ohio, Site was held virtually on October 13, 2020. The 14 (plus 11 site staff) attendees reviewed a summary of the *2019 Site Environmental Report* and received an update on current site activities.

Community Meeting Agenda.

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

Fernald Preserve

U.S. Department of Energy (DOE)
Office of Legacy Management (LM) Mission

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

The LM mission at the Fernald Preserve.

Fernald Preserve

U.S. Department of Energy (DOE)
Office of Legacy Management (LM) Mission

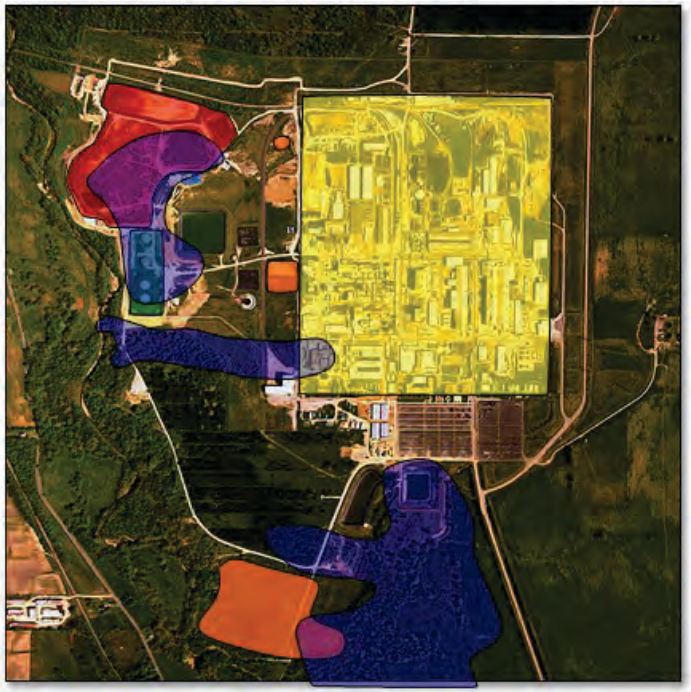
Operable Unit 1
- Waste pits

Operable Unit 2
- Other waste units

Operable Unit 3
- Production area

Operable Unit 4
- Silos

Operable Unit 5
- Environmental media (soil, groundwater, surface water)



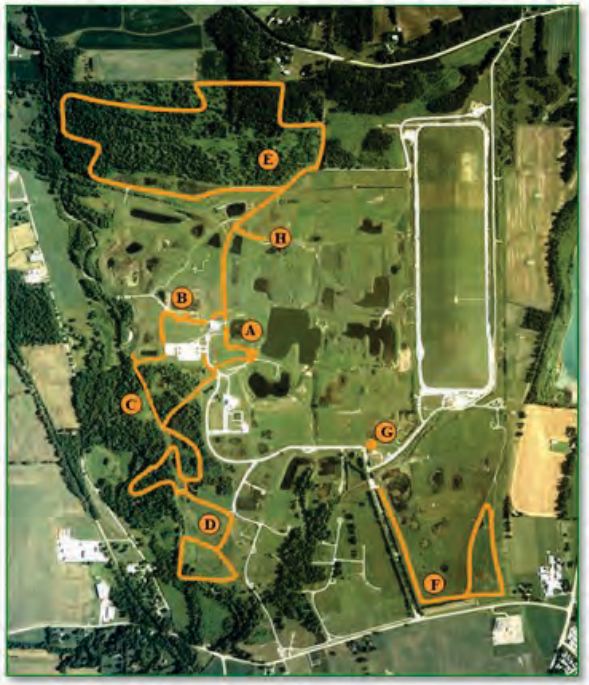
To fulfill the Department's post-closure responsibilities and ensure the future protection of human health and the environment.

Site cleanup was divided into five Operable Units.

Fernald Preserve

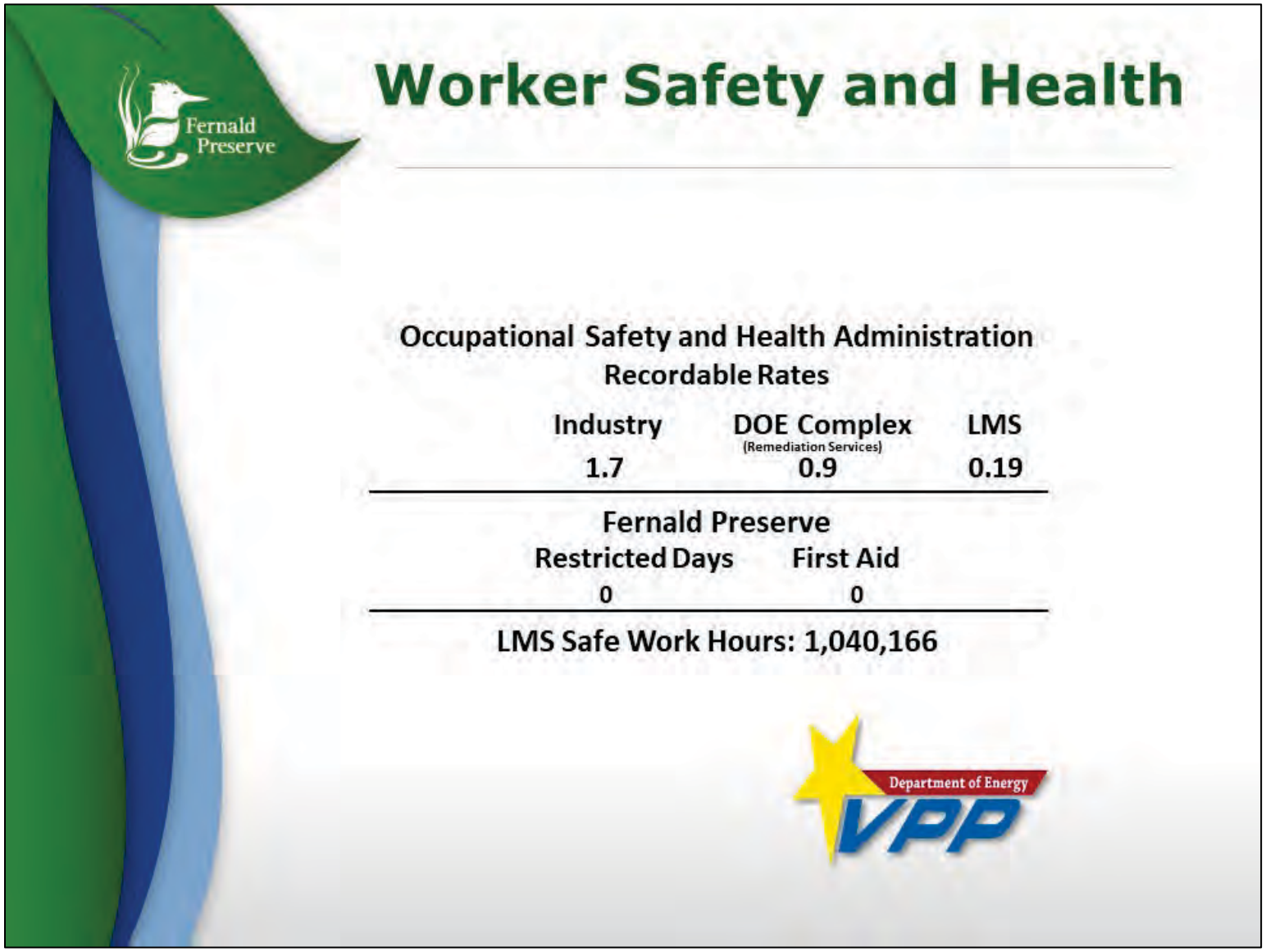
U.S. Department of Energy (DOE)
Office of Legacy Management (LM) Mission

- **A** • Weapons to Wetlands – 0.25 mile
- **B** • Biowetland – 0.1 mile
- **C** • Shingle Oak – 0.7 mile
- **D** • Sycamore – 1.9 miles
- **E** • Hickory – 3.0 miles
- **F** • Lodge Pond – 1.4 miles
- **G** • Overlook
- **H** • Wildlife blind



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

Approximately seven miles of trails are available for hiking at the Fernald Preserve.



Safety records at the Fernald Preserve and in the nationwide LM program continue to surpass overall DOE and private sector standards.

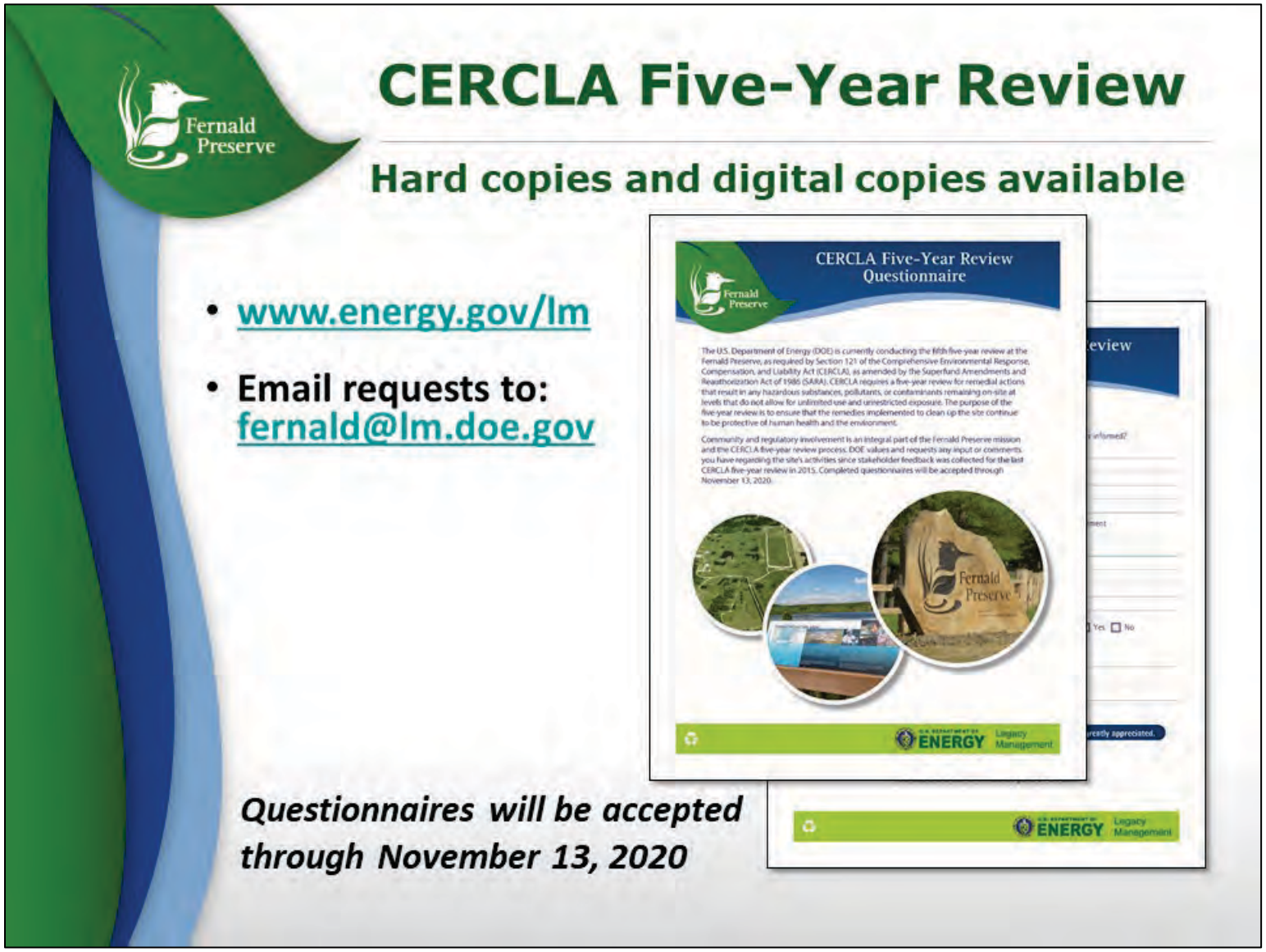
2020 COVID-19 Response

DOE adjusted site activities and public access in response to direction from DOE Headquarters and to state of Ohio guidance regarding the COVID-19 pandemic.

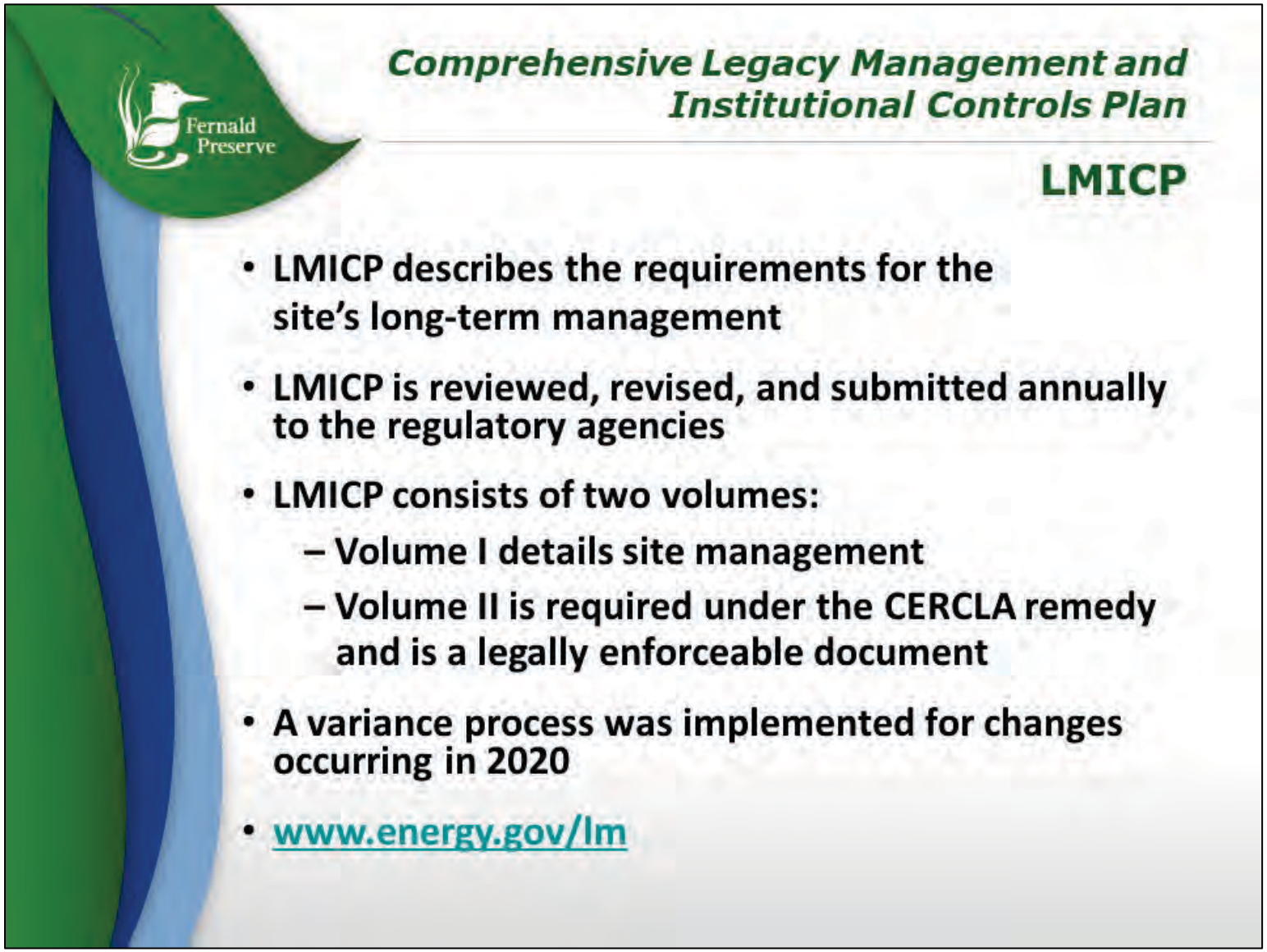
CERCLA Five-Year Review

- Required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Purpose is to determine whether remedy remains protective of human health and the environment
- Draft report due to the U.S. EPA by April 1, 2021
- Five-Year Review process
  - Community involvement
  - Community notification
  - Document review
  - Data review and analysis
  - Site inspections
  - Questionnaires
  - Assess protectiveness

The Fifth CERCLA Five-Year Review of the Fernald site was initiated in October 2020. The draft report will be available for stakeholders to review in April 2021.



Stakeholder input is an important component of the process. Questionnaires are available and will be accepted through November 13, 2020. www.energy.gov/lm
email requests to: fernald@lm.doe.gov

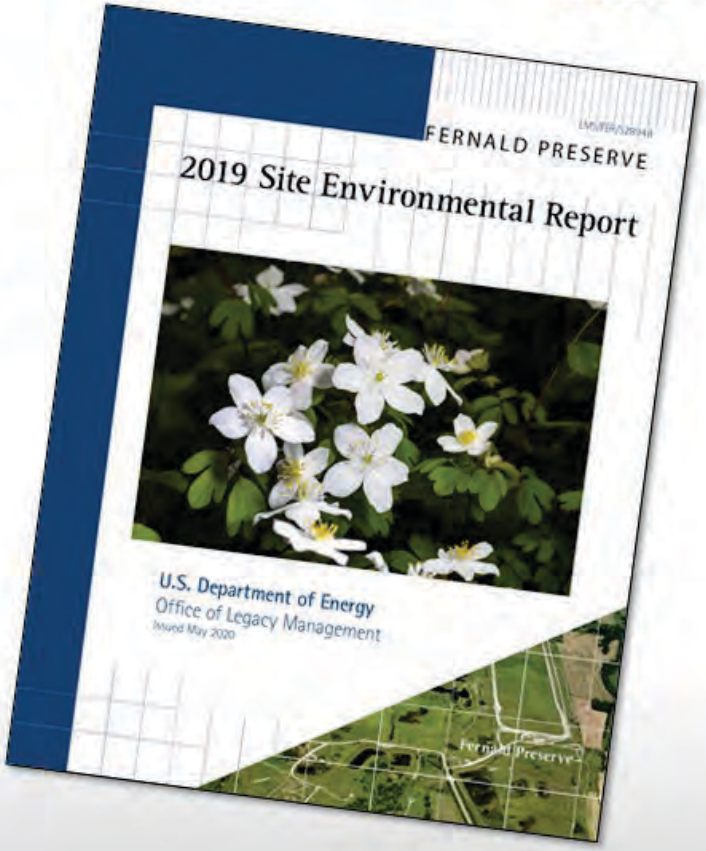


The *Comprehensive Legacy Management and Institutional Controls Plan* documents the requirements for Fernald Preserve's long-term management and is reviewed annually and updated as necessary. The latest version is available at https://www.energy.gov/lm/fernald-preserve-ohio-site.

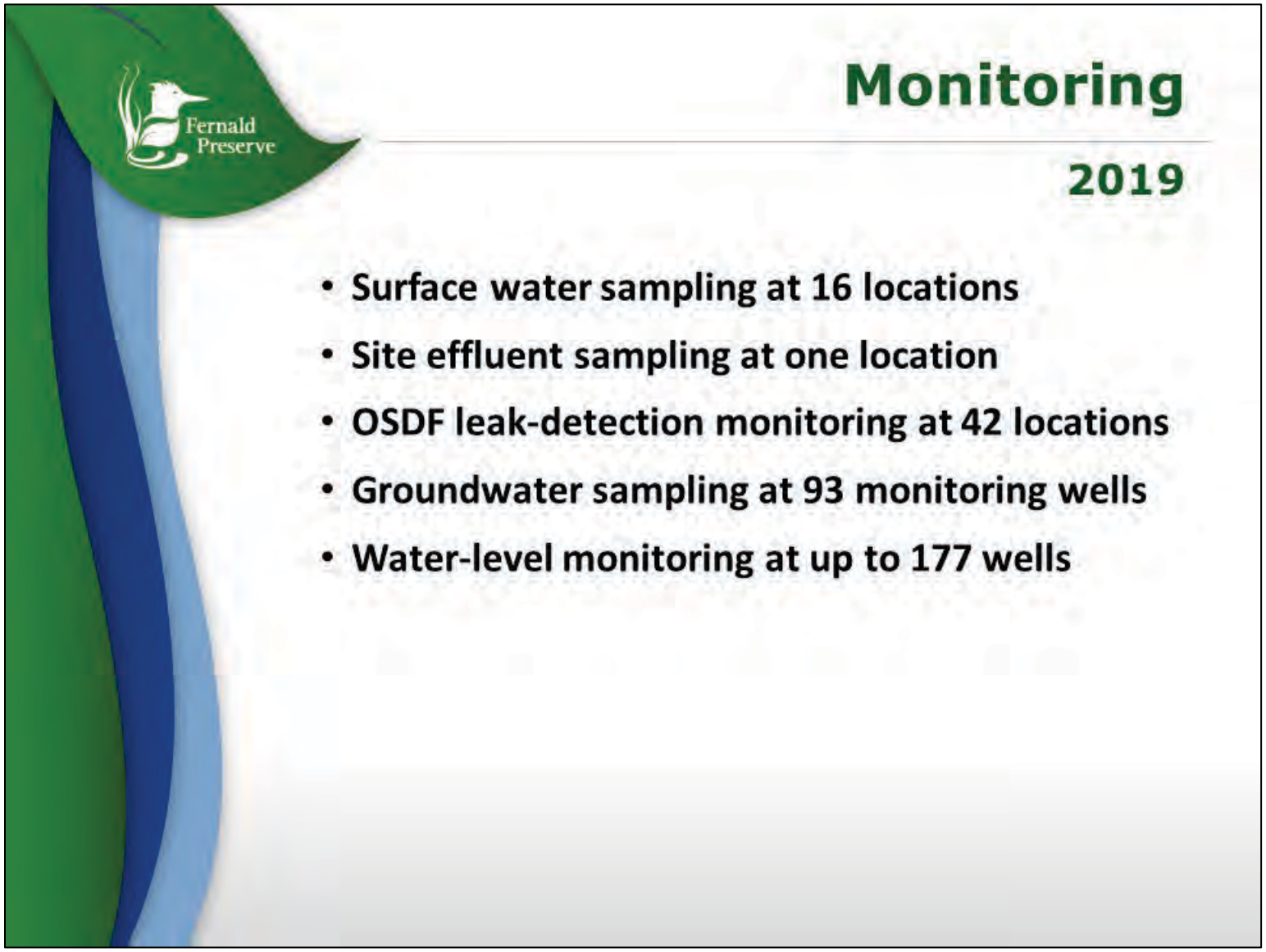
2019 Site Environmental Report

SER

- www.energy.gov/lm
- **Email requests to:** fernald@lm.doe.gov



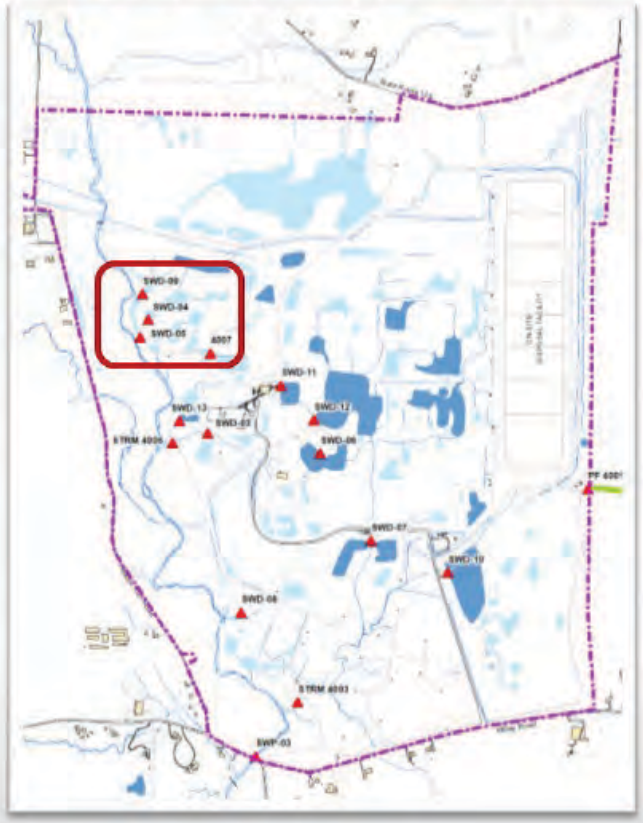
The *2019 Site Environmental Report* contains annual monitoring requirement results and is available at https://www.energy.gov/lm/fernald-preserve-ohio-site.



Routine environmental monitoring is conducted to ensure continued effectiveness of the site's cleanup. The 2019 monitoring program included sampling groundwater, surface water, and effluent.

Monitoring

Surface Water and Site Effluent

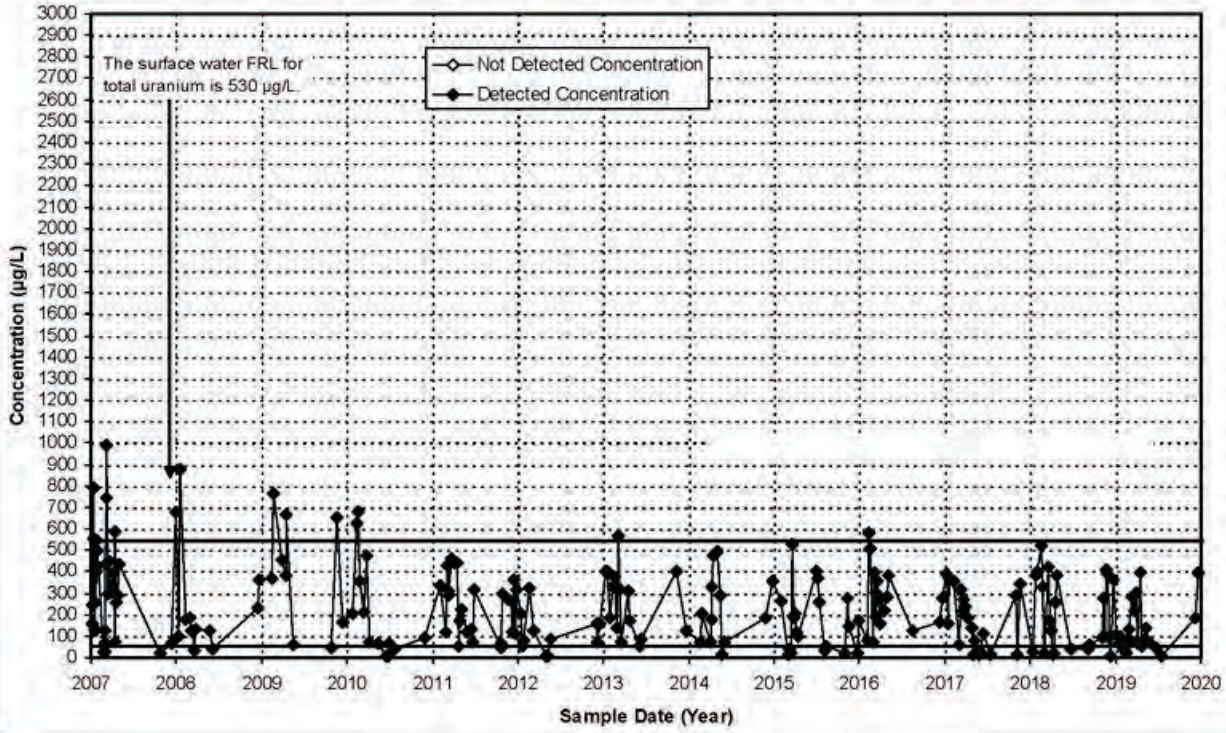


Surface water continues to be monitored at numerous locations on and off-site.

Monitoring

Surface Water

Total Uranium Concentration SWD-05

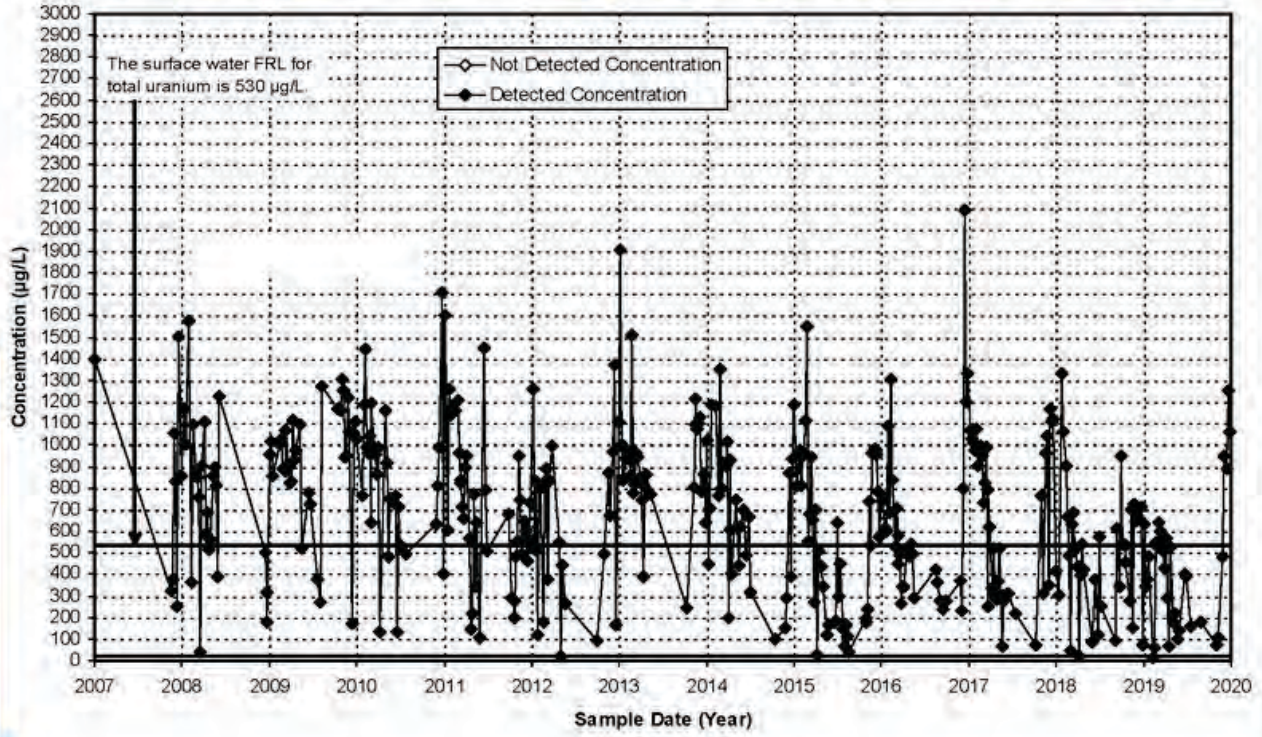


The 2019 results at sampling location SWD-05 were below the surface water total uranium final remediation level of 530 micrograms per liter.

Monitoring

Surface Water

Total Uranium Concentration SWD-09

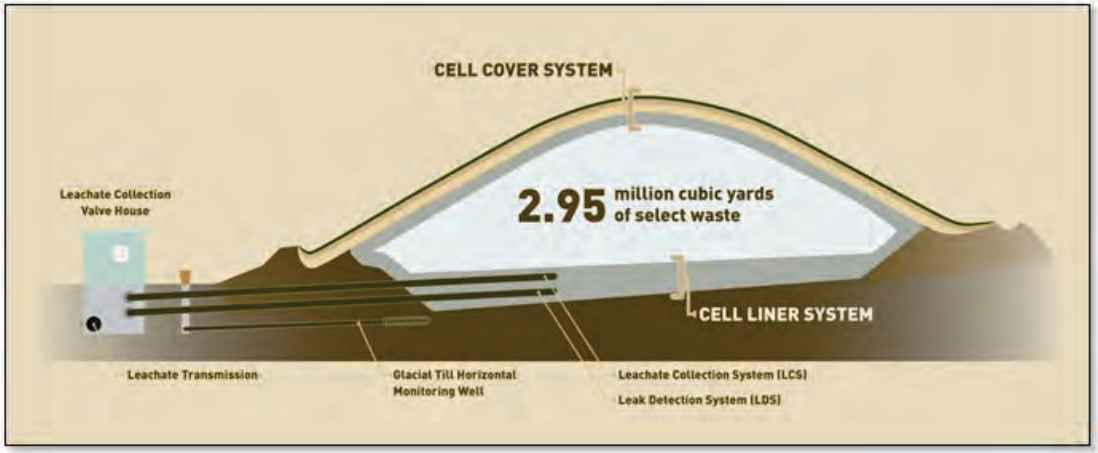


The 530 microgram per liter final remediation level was exceeded at SWD-09 during 2019, however, levels stayed below the high concentration recorded in late 2016. Sampling locations SWD-09 and SWD-05 are not located in publicly accessible areas of the site.

The On-Site Disposal Facility (OSDF) is an engineered waste storage facility that holds 2.95 million cubic yards of waste (85% soil/soil-like material and 15% demolition debris) that was generated as part of the site cleanup.

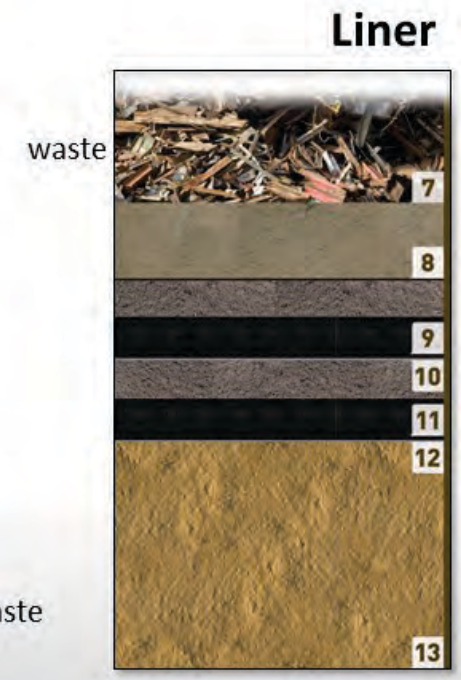
On-Site Disposal Facility

Leachate Collection System

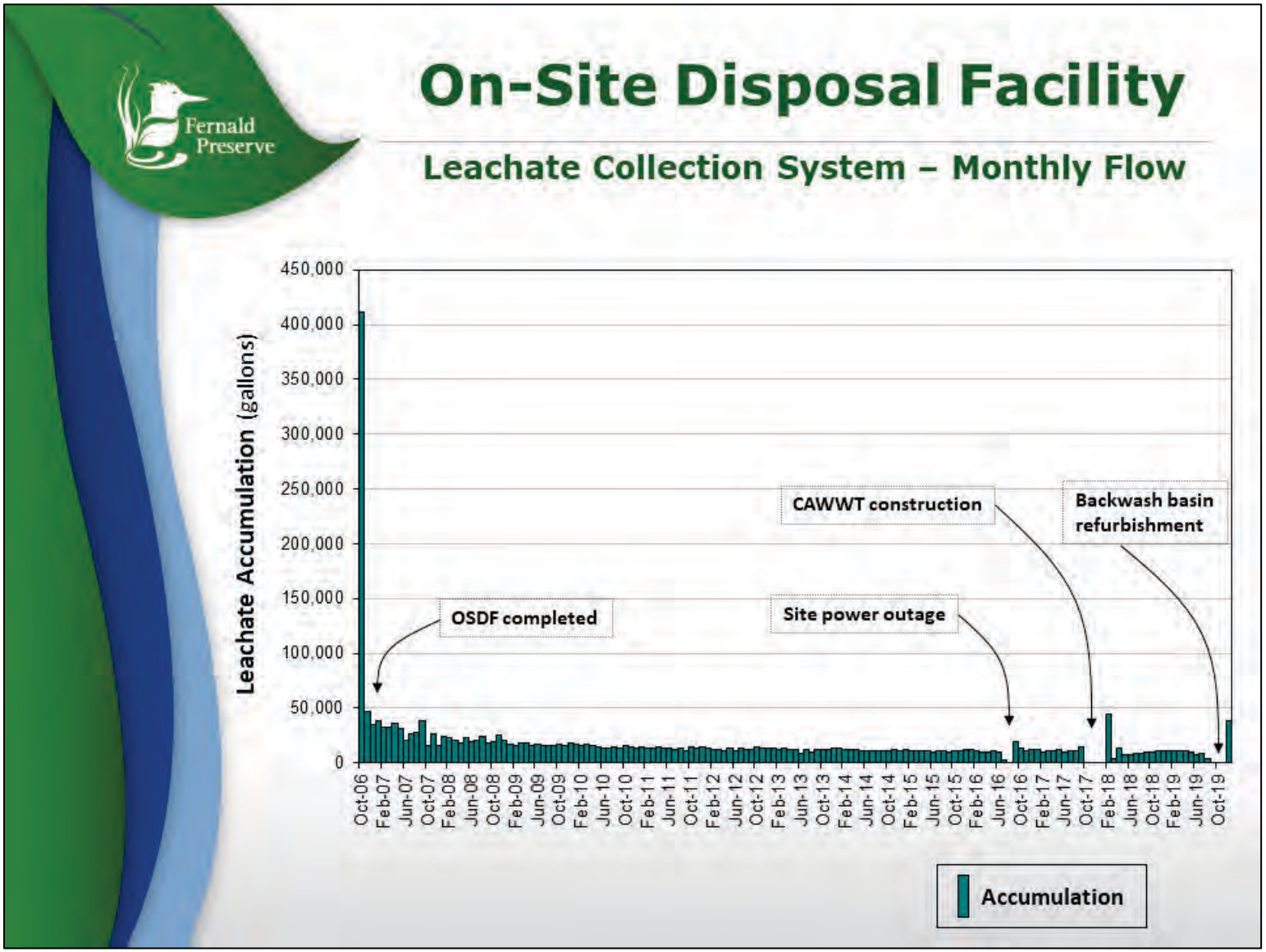


The OSDF was constructed with an engineered liner and cover system that serves to isolate the entombed waste from the environment.

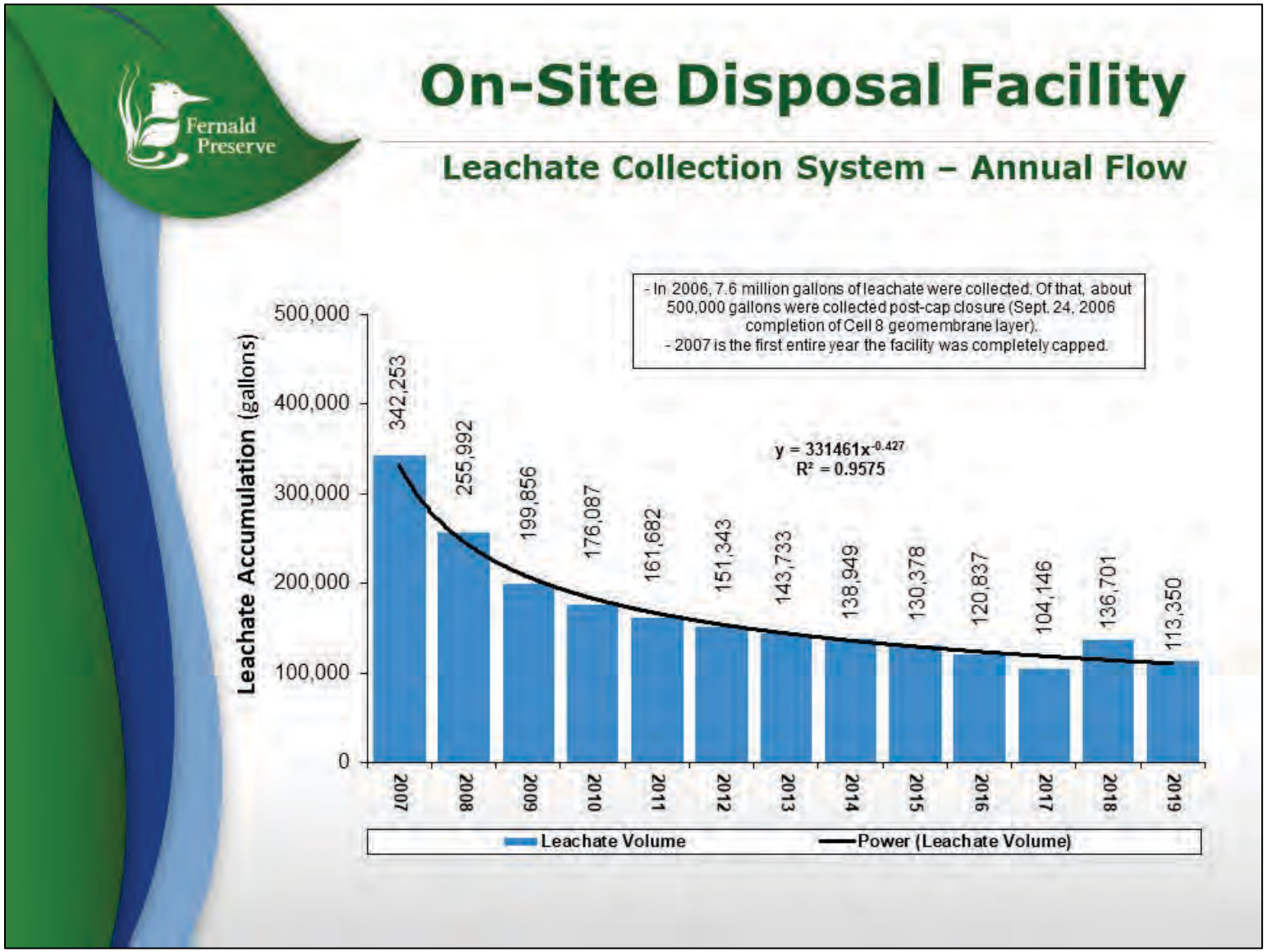
On-Site Disposal Facility



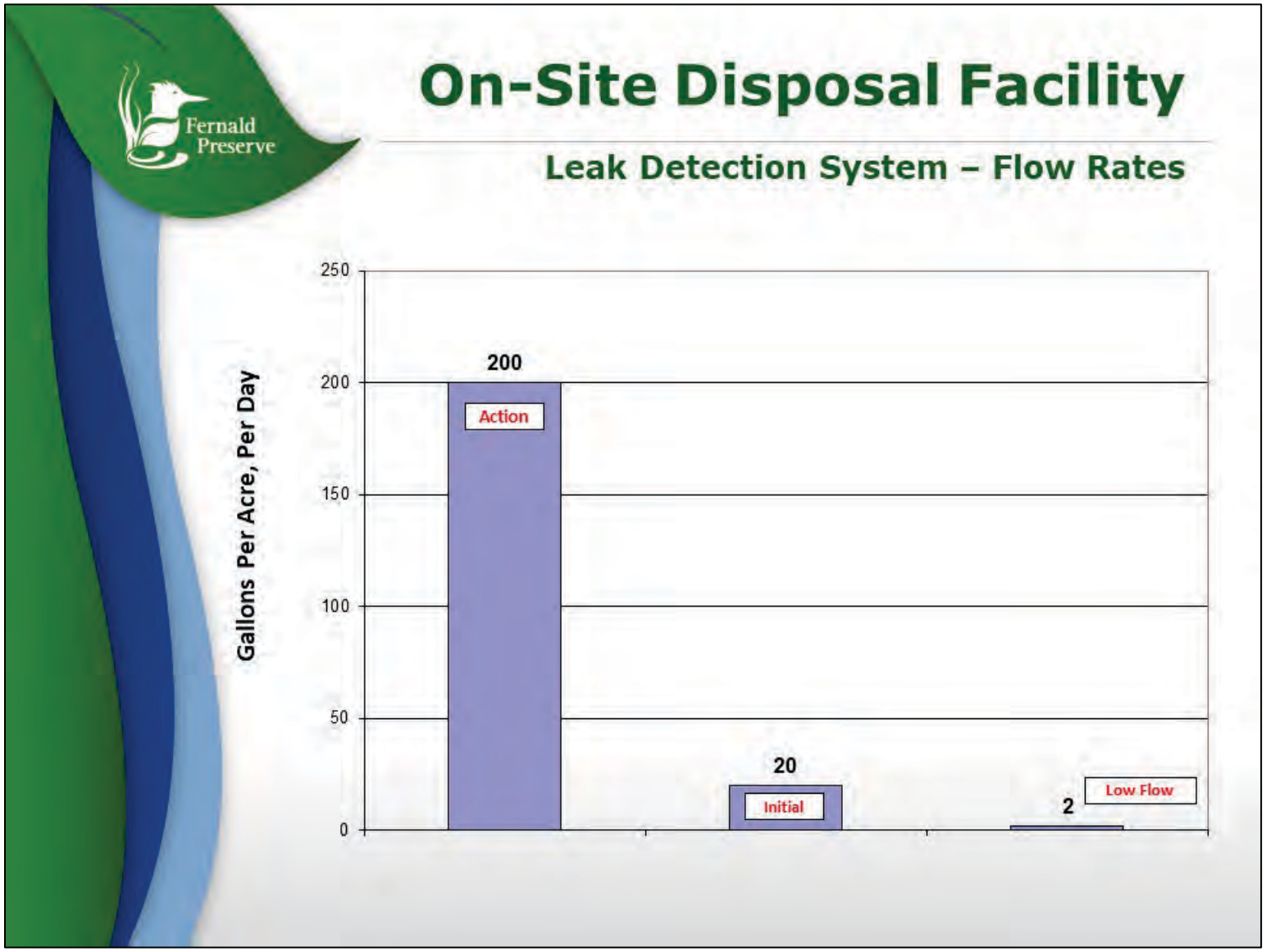
Waste is safely encapsulated between a 9-foot cap and a 6-foot liner within the OSDF.



Leachate is the moisture in the waste within the OSDF and includes water sprayed on the waste to control dust and rainfall events during remediation and placement in the OSDF. The leachate is collected and transferred to an on-site treatment facility. Before the cover system was completed in October 2006, hundreds of thousands of gallons of leachate flowed each month.



Leachate is the moisture in the waste within the OSDF. The leachate is collected and transferred to an on-site water treatment facility. As expected, annual leachate flow continues to decline.



By design, monitoring flow from the Leak Detection System (LDS) is one of the main indicators of whether the facility is operating as designed. DOE monitors the volume of liquid collected by the LDS. Different flow rate thresholds were established over time as volumes decreased (see next slide).

On-Site Disposal Facility

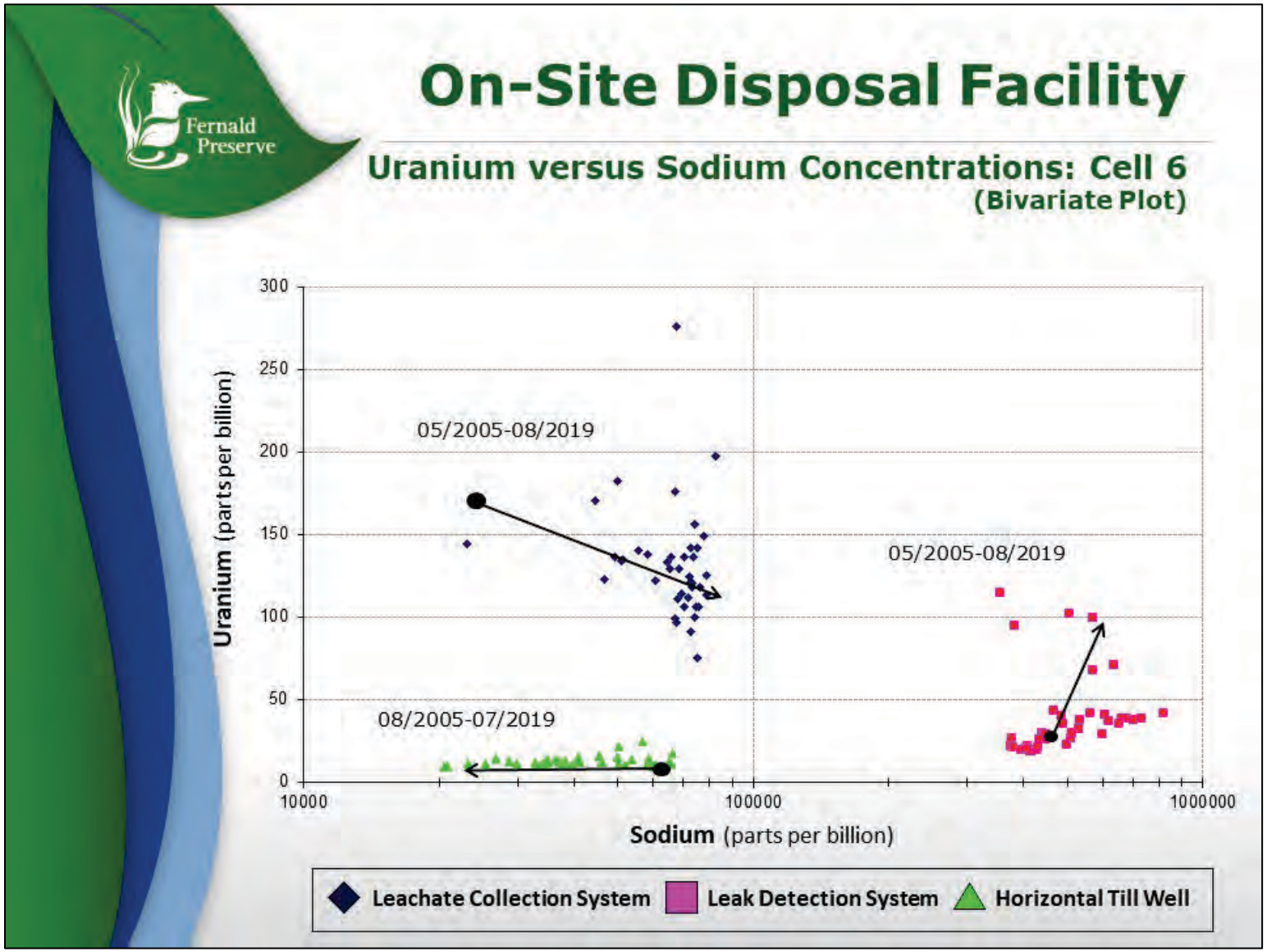
Low Flow Response Leakage Rate Basis

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	0.45
2014	6	0.06	0.40
2015	6	0.23	1.50
2016	6	0.18	1.20
2017	6	0.05	0.32
2018	6	0.11	0.70
2019	6	0.32	1.60

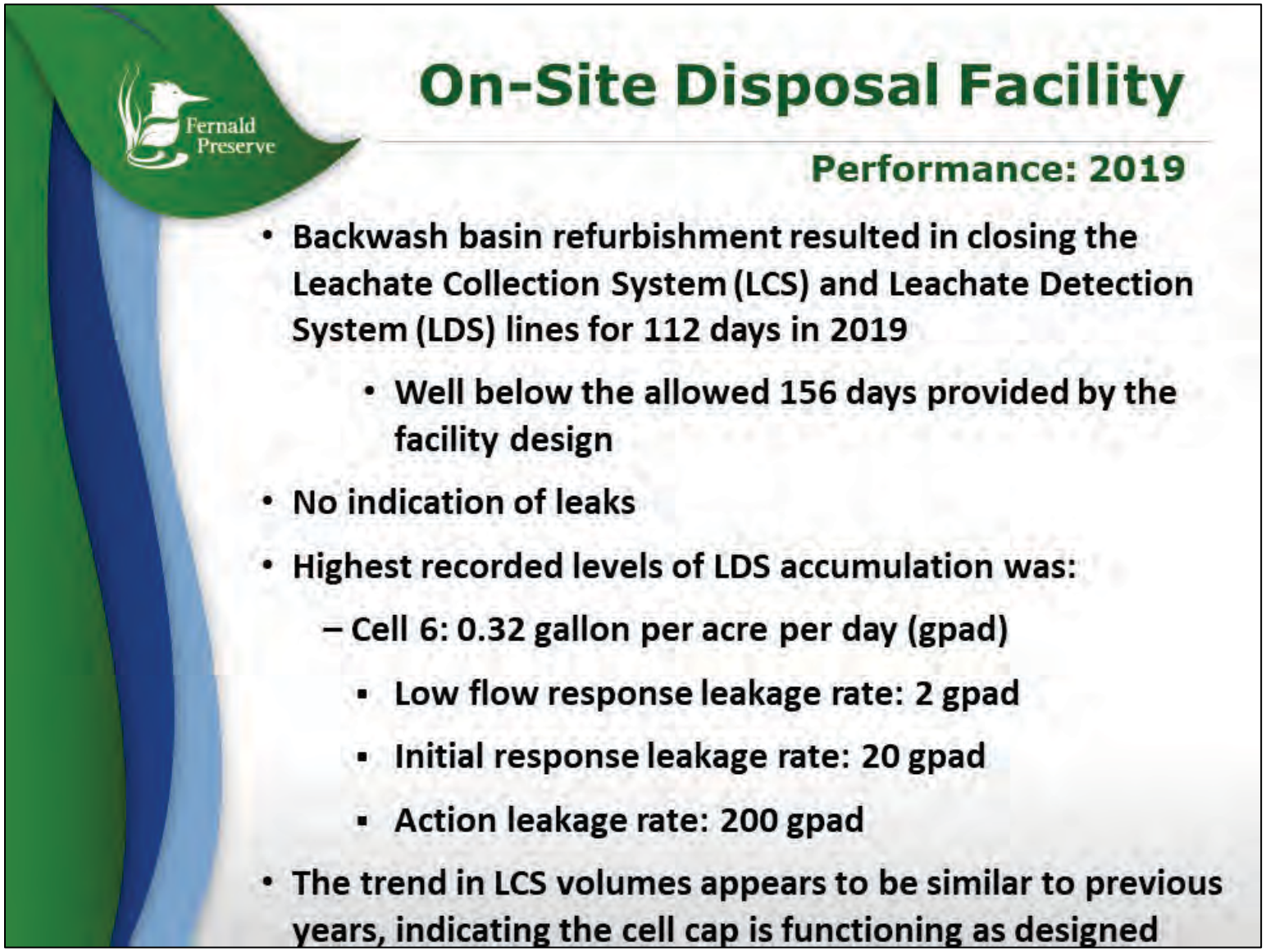
Action leakage rate	200 gpad	1,300-1,900 gpd
Initial response leakage rate	20 gpad	130-190 gpd
Low response leakage rate	2 gpad	13-19 gpd

gpad: gallons per acre per day
gpd: gallons per day

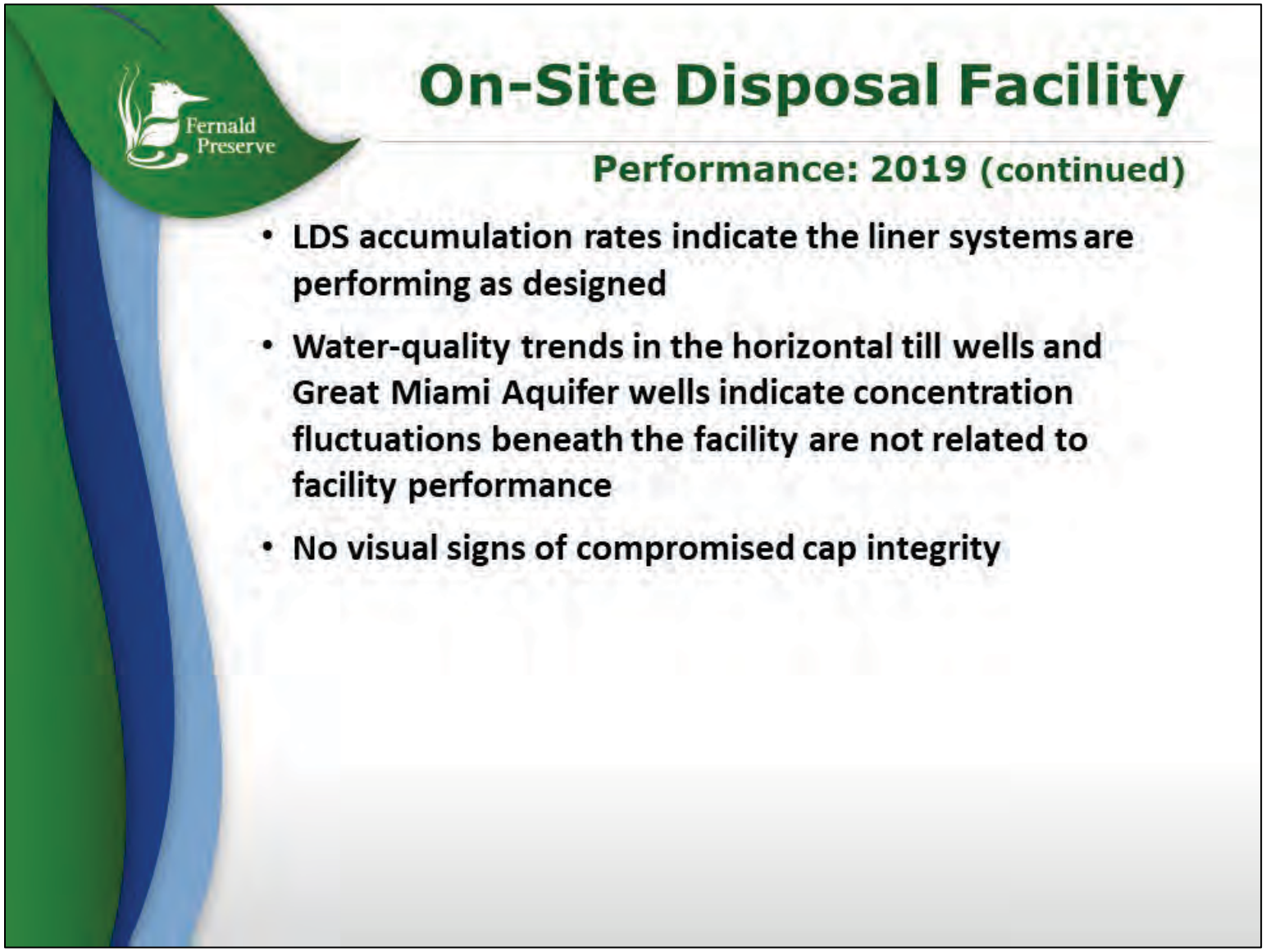
Leak Detection System accumulation rates in the disposal cells are so low that a low-flow response leakage rate of 2 gallons per acre per day has been defined. By comparison, the response leakage rate is 20 gallons per acre per day and the action leakage rate is 200 gallons per acre per day.



A comparison of uranium concentrations and sodium concentrations in and below Cell 6 of the OSDF is an example of a method used to demonstrate that the liner system is working as designed.

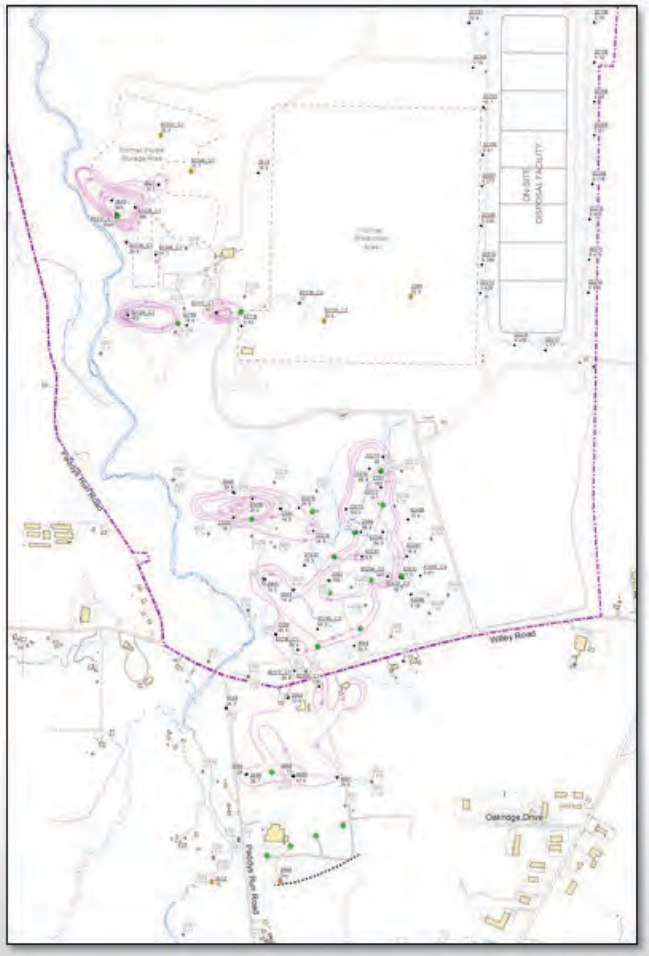


OSDF continues to perform as designed in 2019.

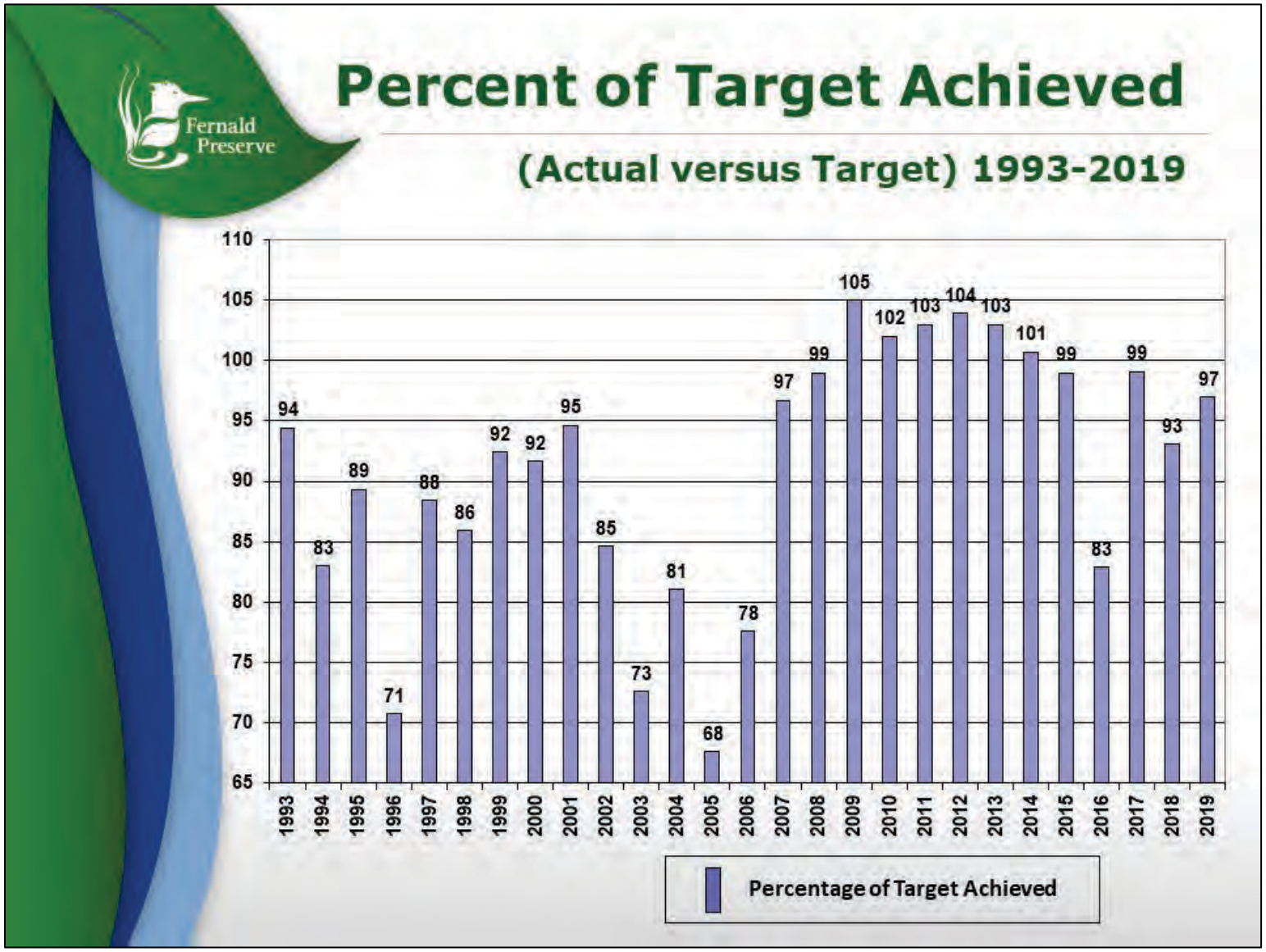


OSDF continues to perform as designed in 2019.

Aquifer Restoration



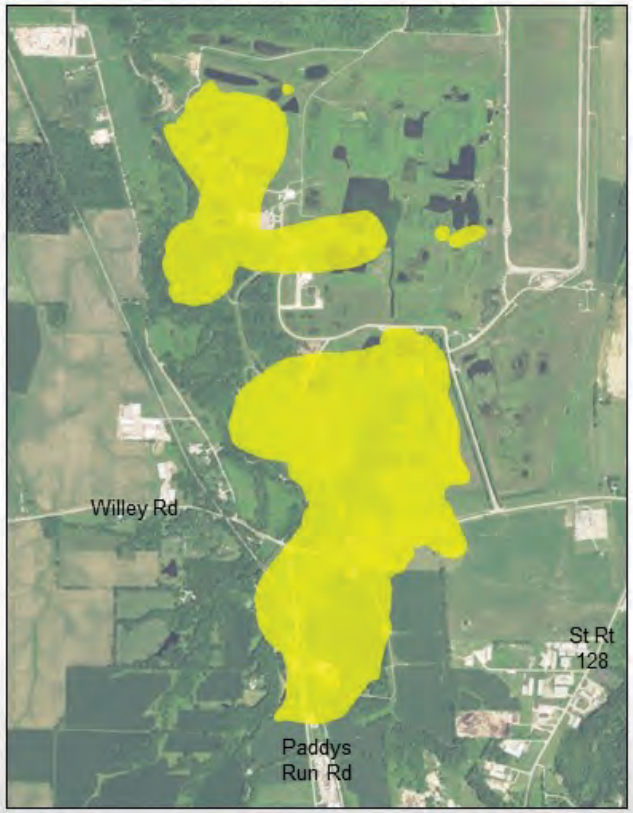
A concentration-based groundwater cleanup continues at the site.



Since site closure in 2006, operations have achieved at least 97% of the planned annual target pumping rates, with the exception of: 1) an unplanned well field shutdown that occurred due to site electrical problems in the summer of 2016, and 2) several well field shutdowns that occurred during planned demolition and construction to downsize the Converted Advanced Wastewater Treatment facility (CAWWT) in 2018.

Aquifer Restoration

Target Certification Footprint

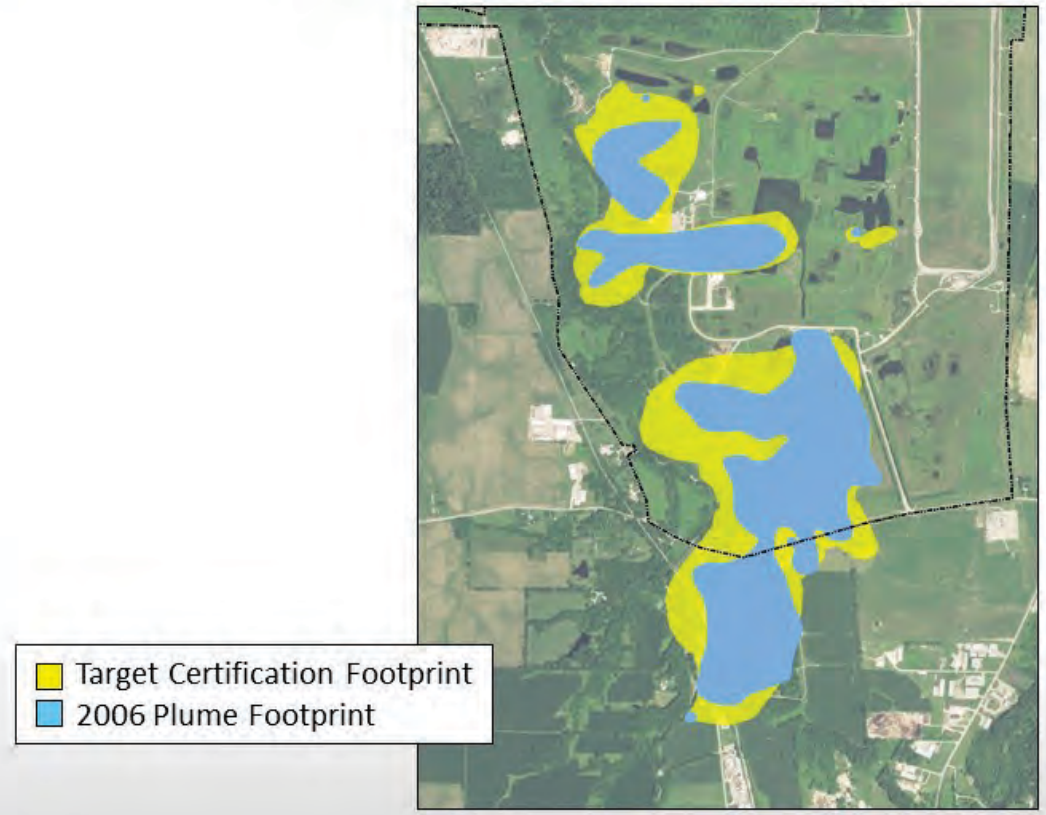


Target Certification Footprint

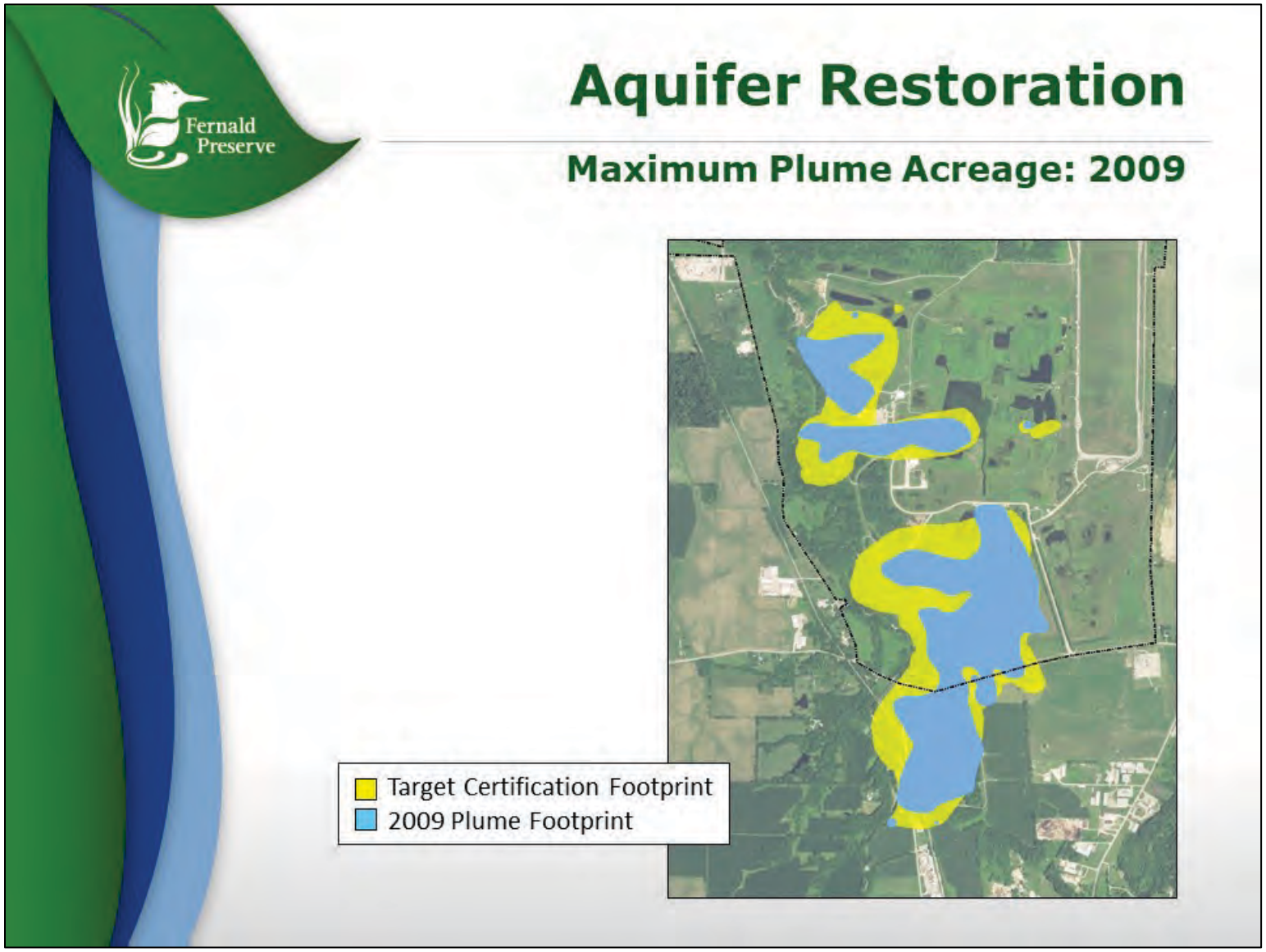
The target certification footprint is the area of the plume targeted for cleanup (312.697 acres).

Aquifer Restoration

Maximum Plume Acreage: 2006



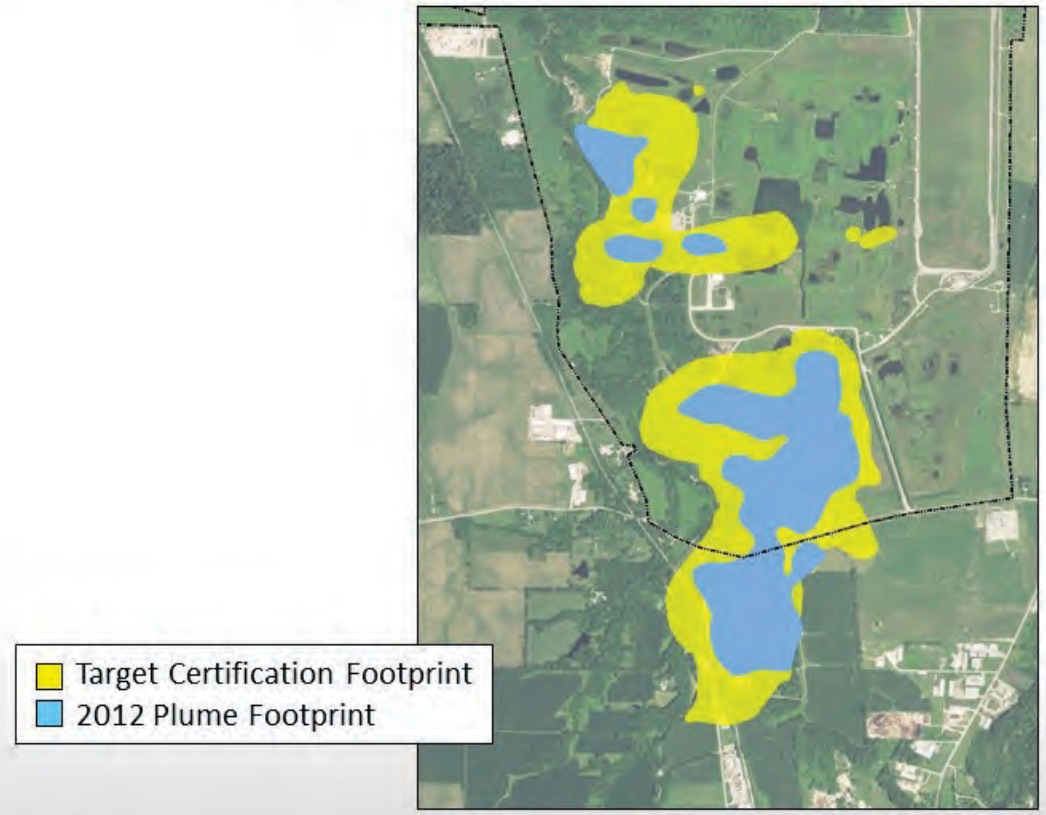
In 2006 the area of the aquifer left to remediate was 189 acres (shown in blue). Target certification footprint is shown in yellow.



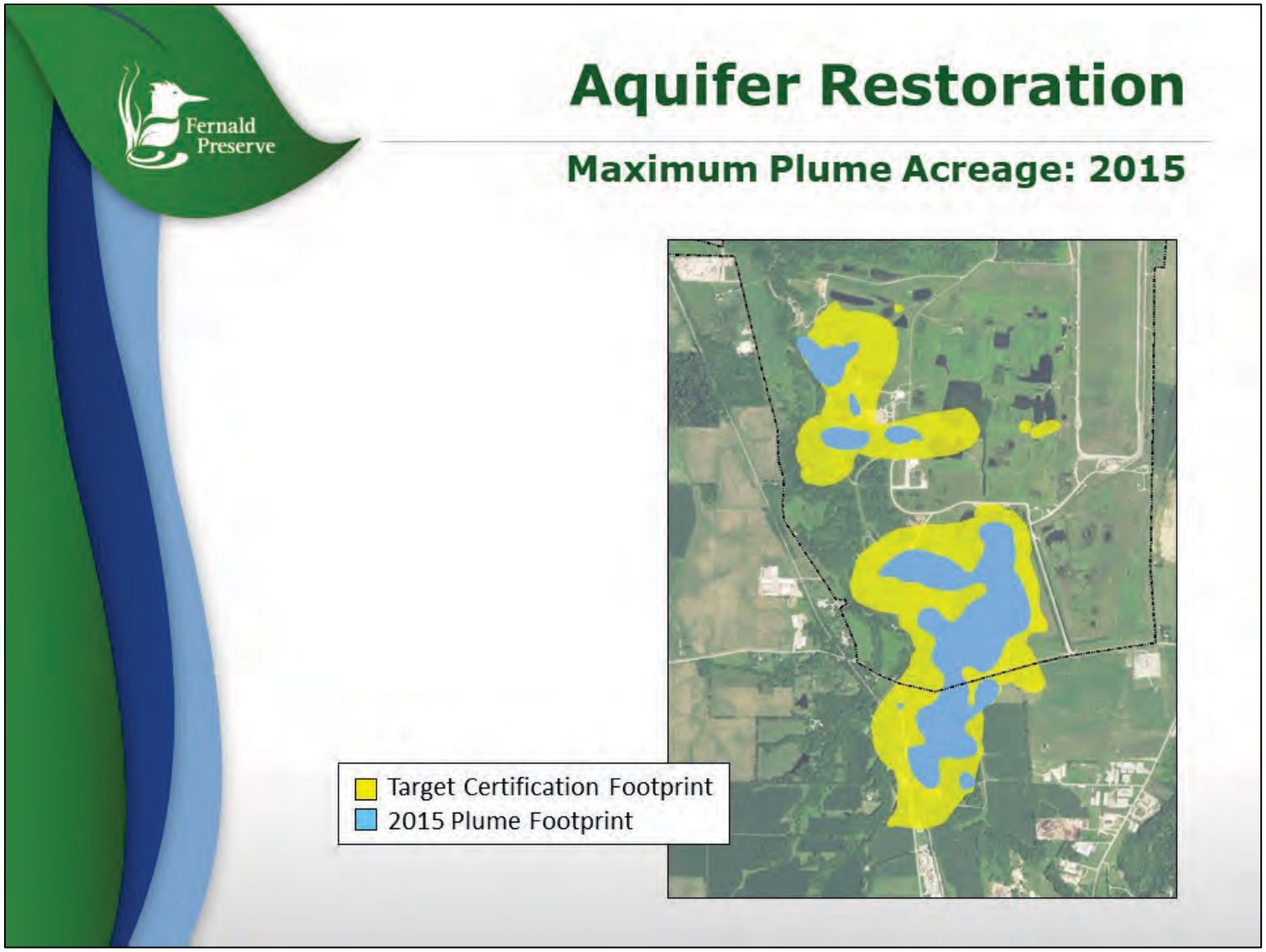
In 2009, the area of the aquifer left to remediate was 186 acres (shown in blue). Target certification footprint is shown in yellow.

Aquifer Restoration

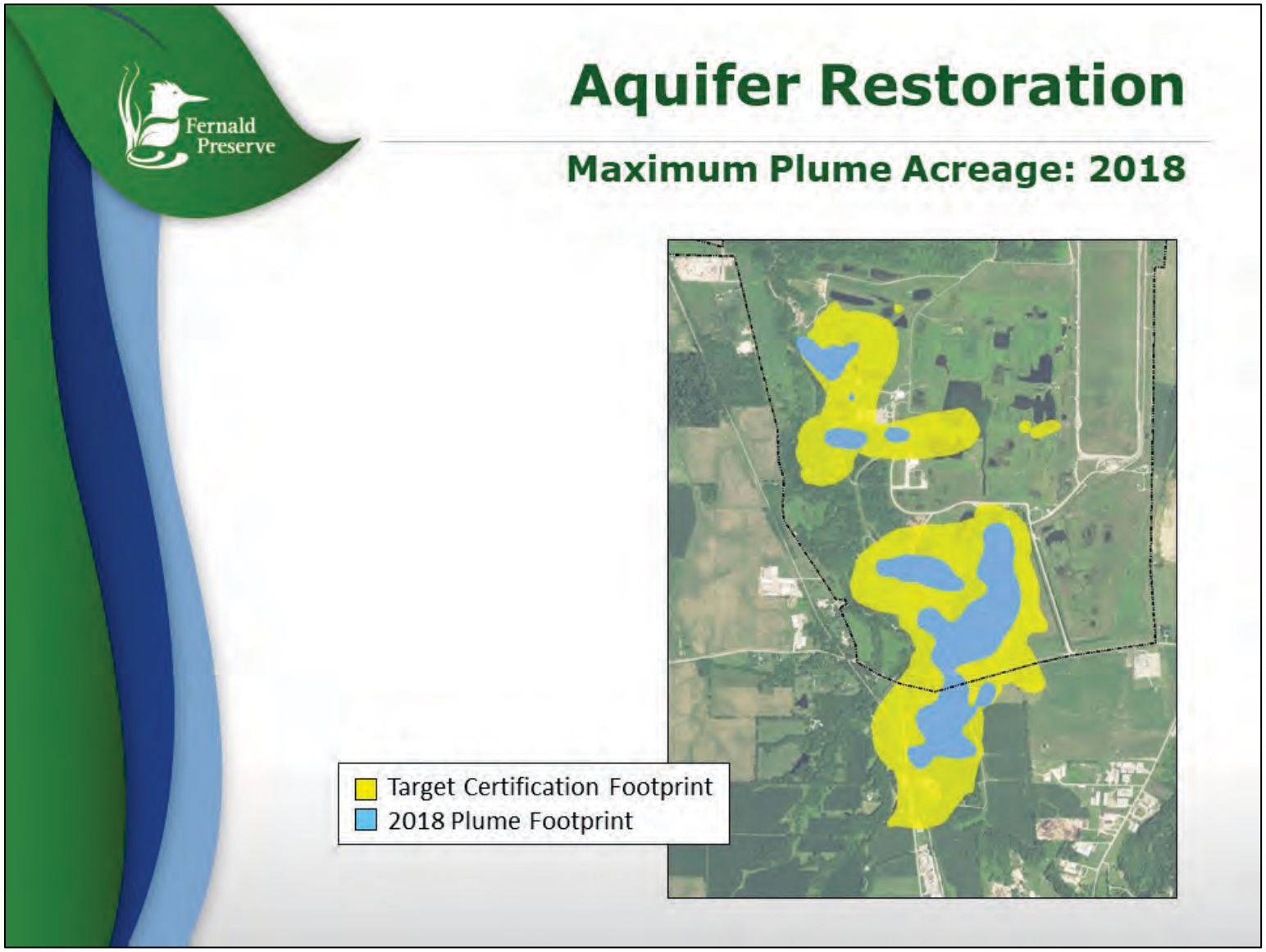
Maximum Plume Acreage: 2012



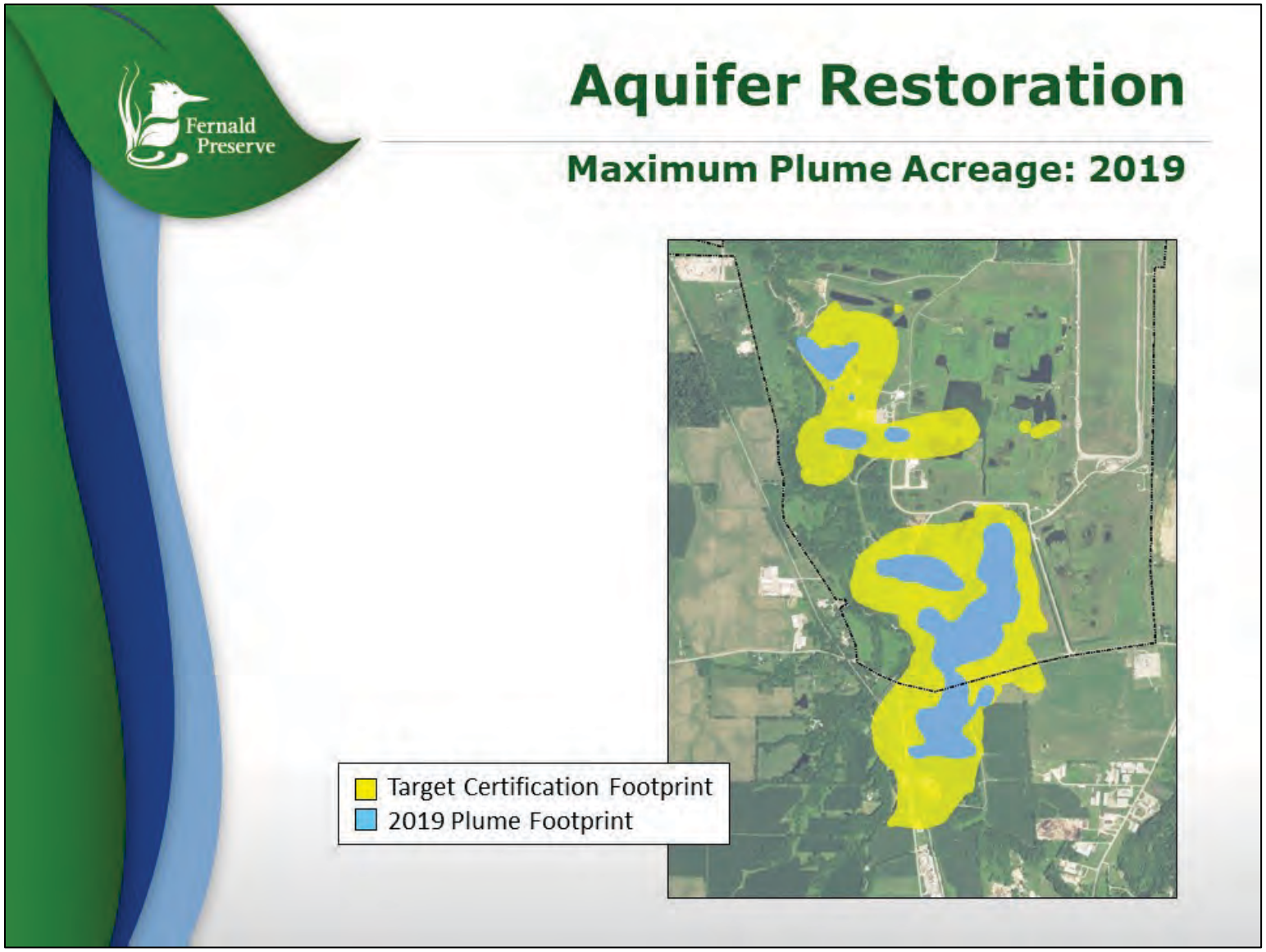
In 2012, the area of the aquifer left to remediate was 130.3 acres (shown in blue). Target certification footprint is shown in yellow.



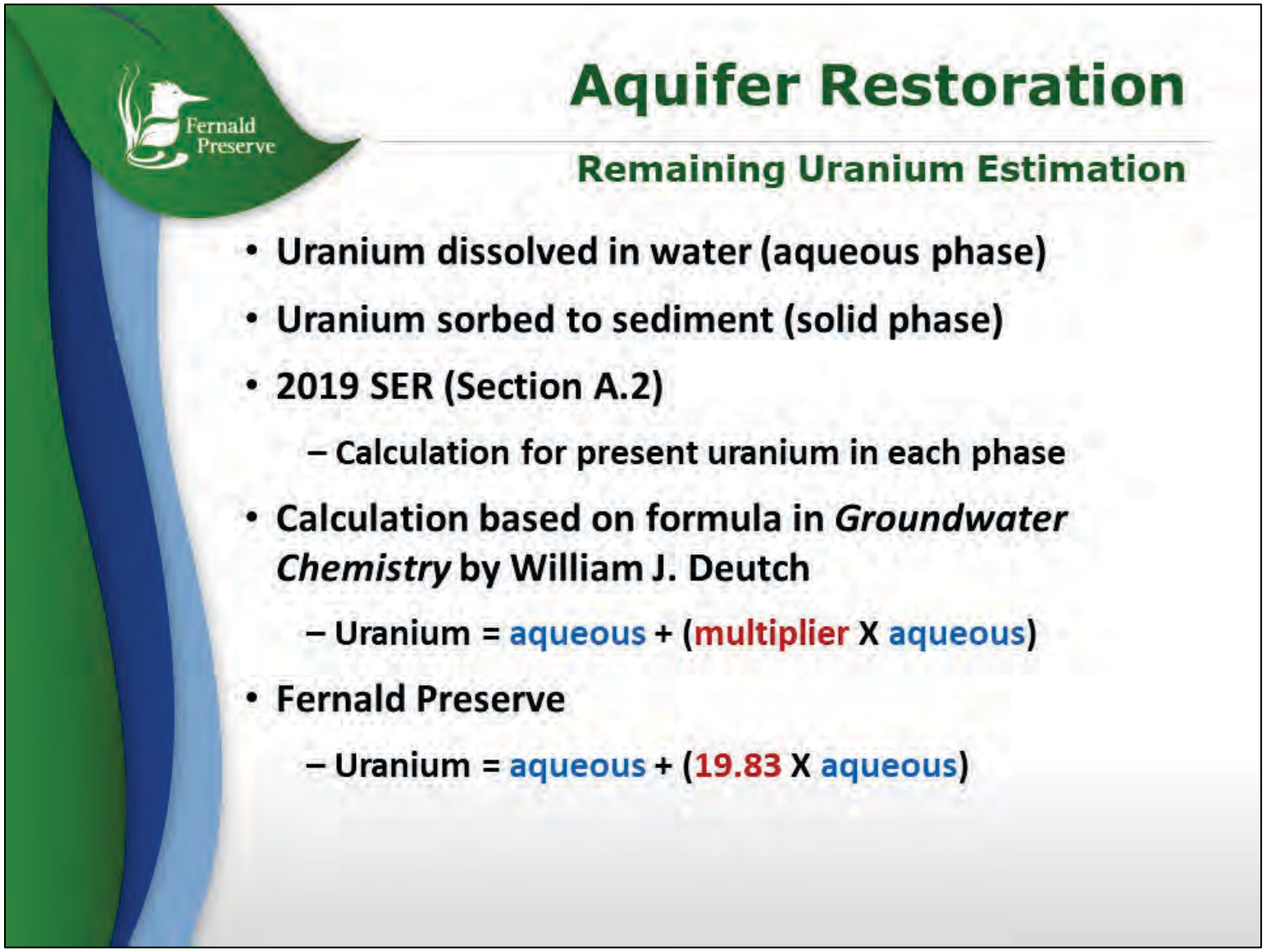
In 2015, the area of the aquifer left to remediate was 109.5 acres (shown in blue). Target certification footprint is shown in yellow.



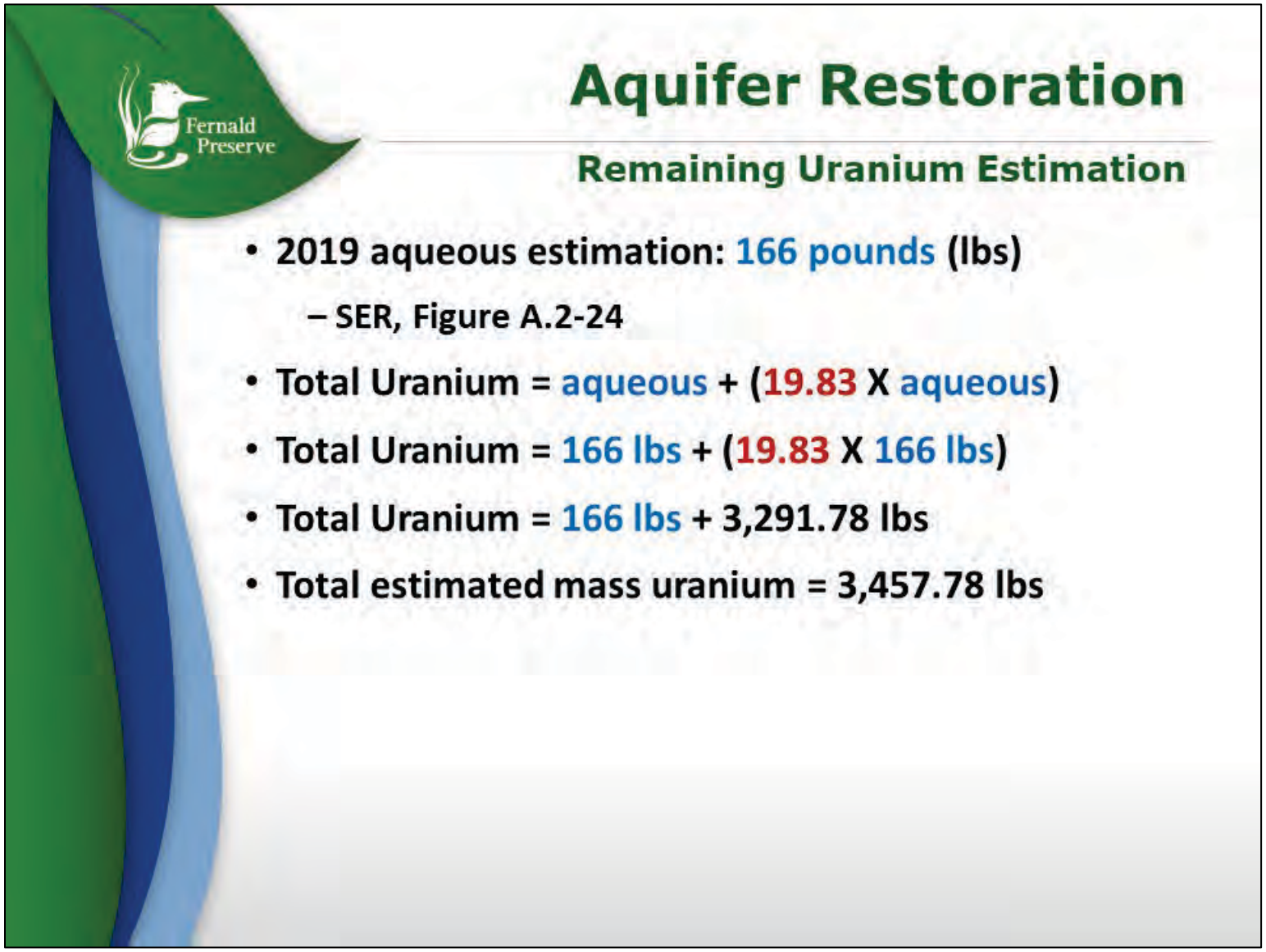
In 2018, the area of the aquifer left to remediate was 89.3 acres (shown in blue). Target certification footprint is shown in yellow.



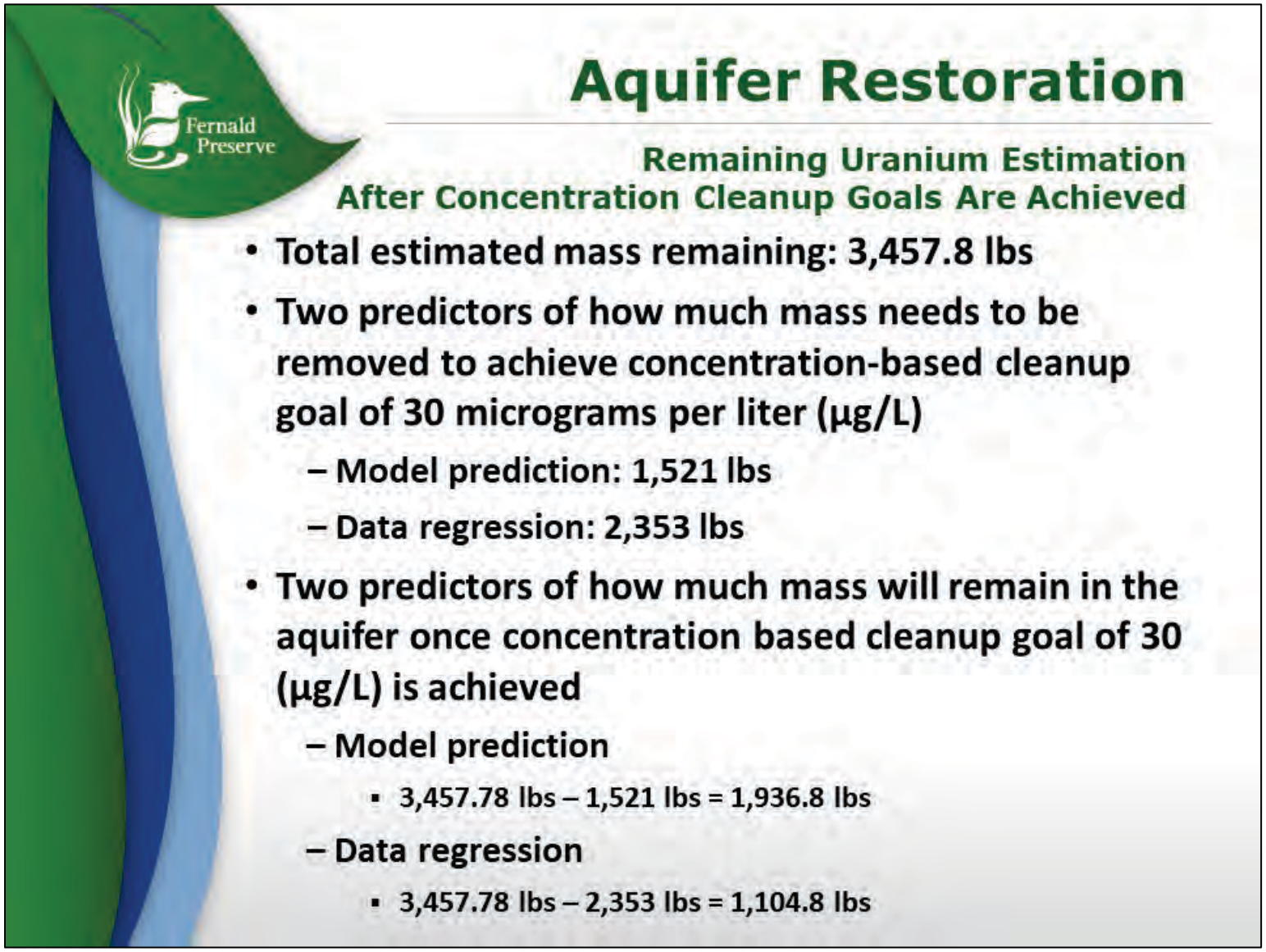
In 2019, the area of the aquifer left to remediate was 86.5 acres (shown in blue). Target certification footprint is shown in yellow. The area of the aquifer left to remediate decreased from 189 acres in 2006 to 86.5 acres in 2019 — a decrease of 54.2%.



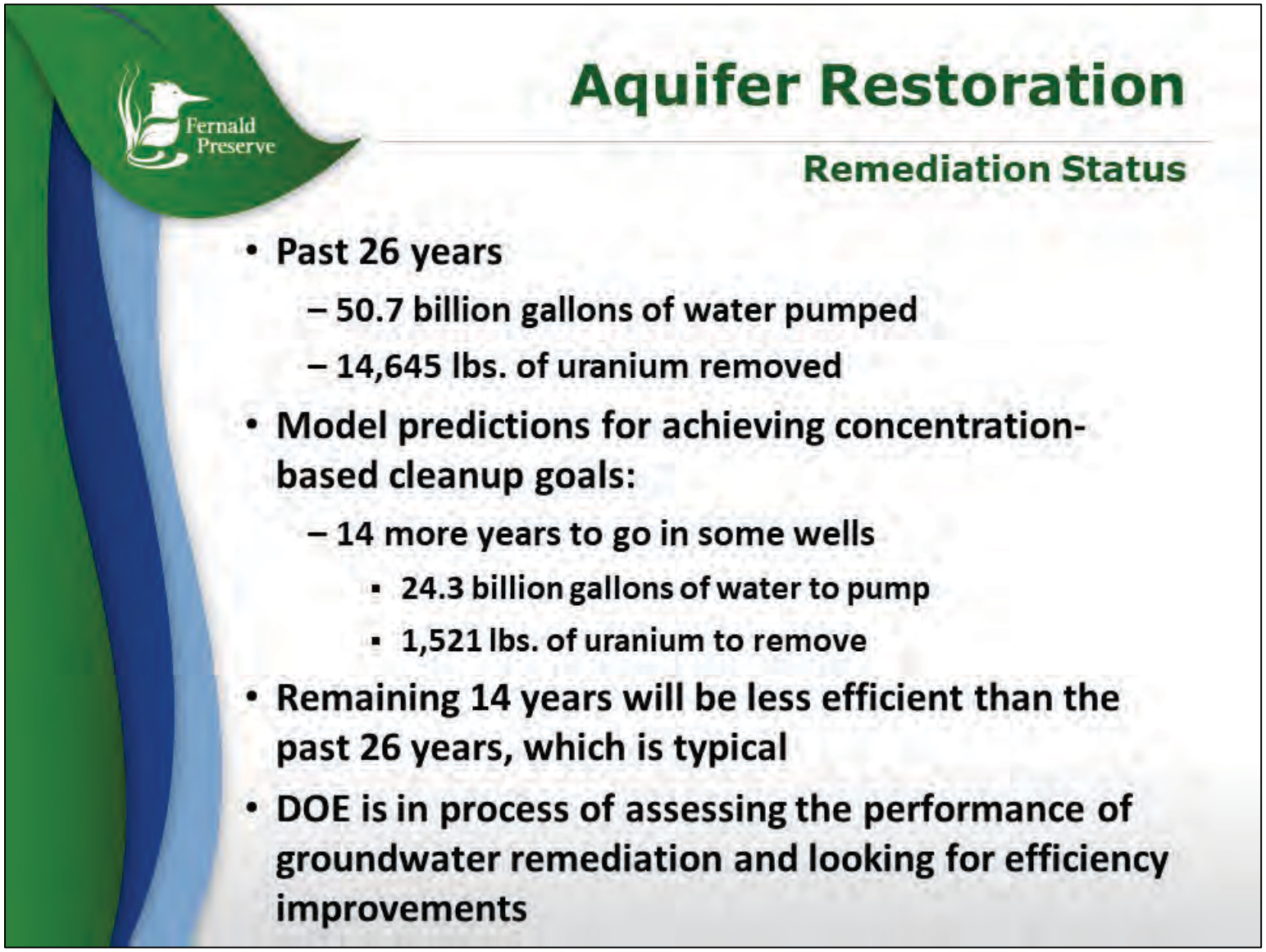
Calculations are presented that provide an estimate of how many pounds of uranium may be left in the aquifer after concentration-based cleanup goals are achieved.



At the end of 2019, an estimate of total mass of uranium remaining in the aquifer is 3,458 pounds.



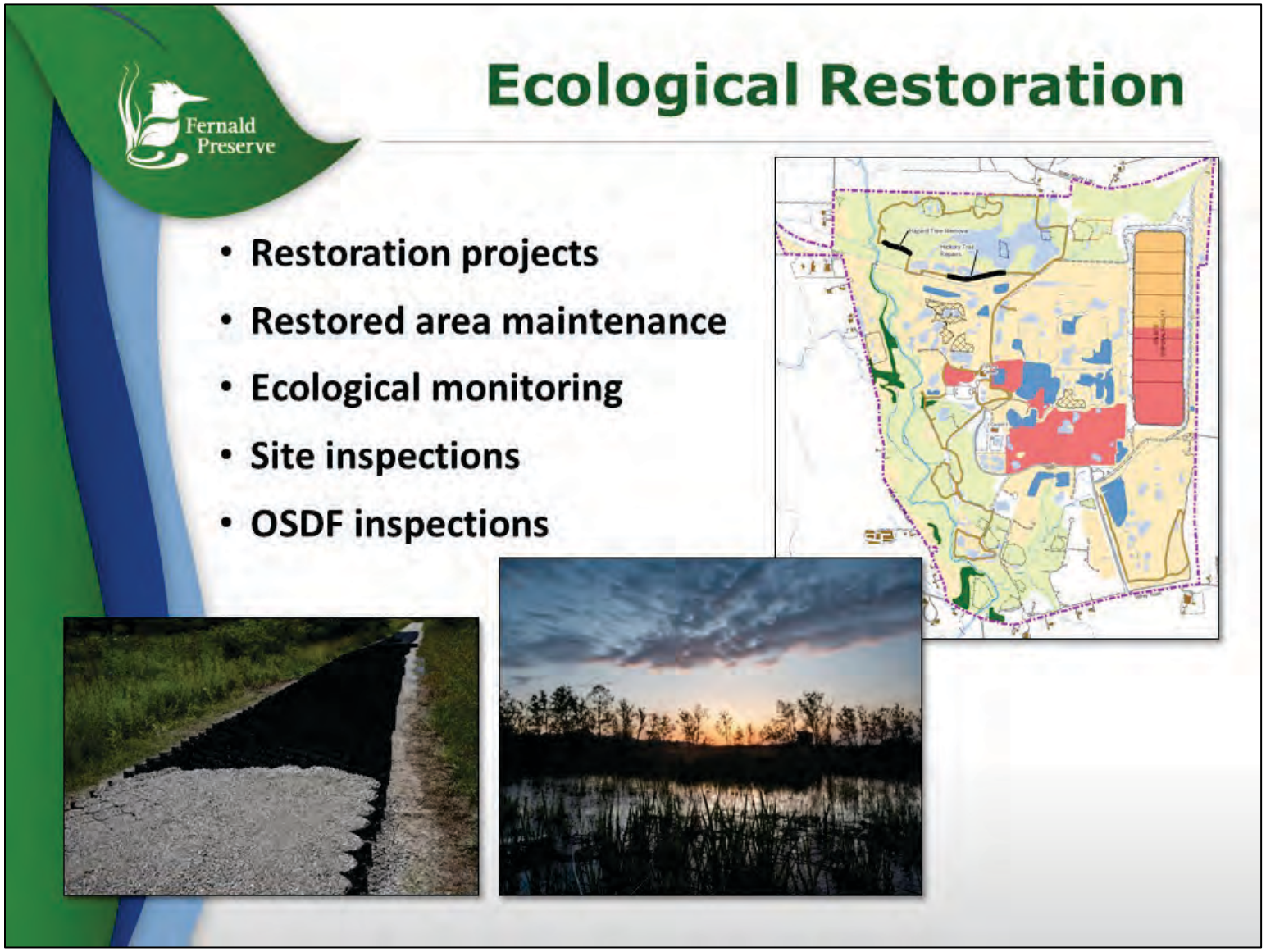
An estimate of how many pounds of uranium may be left in aquifer after concentration-based cleanup goals are achieved is presented.



Uranium-concentration data trends and modeling predictions indicate that the pumping operation is becoming less efficient over time. This is typical of groundwater pump-and-treat systems, and DOE continues to look for ways to improve system performance.

Aquifer Restoration

The struggle with iron plugging of wells, pumps, and motors continues. Five wells were rehabilitated in 2019 to address iron plugging. Iron plugging decreases the pumping efficiency of the well.



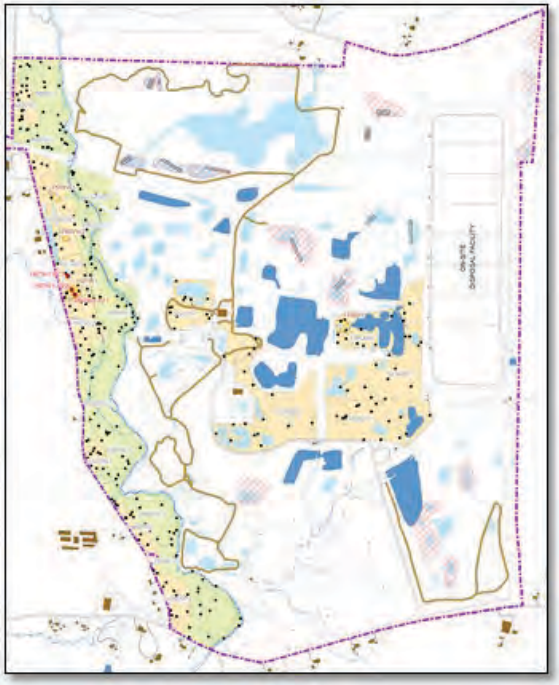
Ecological restoration work includes maintenance, monitoring, and inspections.

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

Ecological Restoration

Monitoring

- Wetland mitigation
- Functional
- Implementation
- OSDF vegetation cover

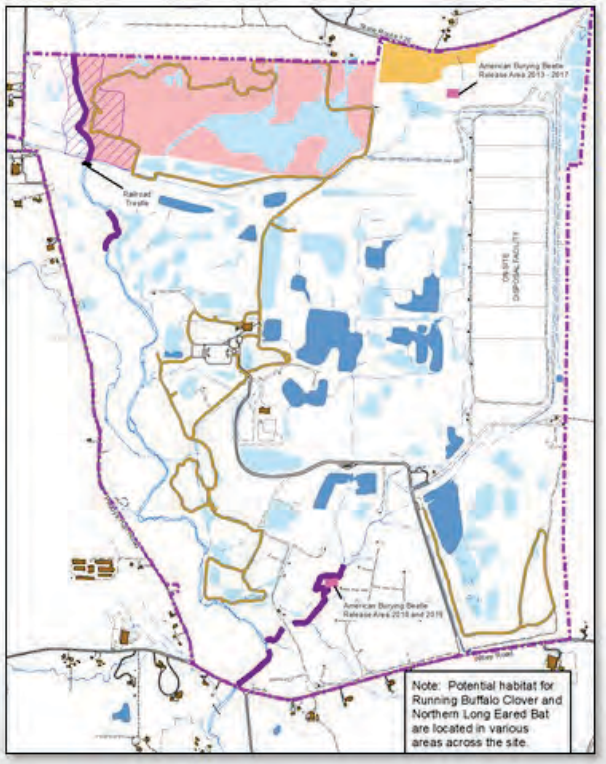


Monitoring programs help site personnel evaluate the status of ecologically restored areas at the site, including the health and diversity of amphibian populations.

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



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

Interpretive Services

Public Amenities and Services

- Trails, wildlife watching, exhibits, meeting spaces, program services, staff support
- New official Sunday hours began September 22, 2019
  - Noon to 5:00 p.m.

Since the site opened to the public in 2008, schools, conservation organizations, former workers, bird watchers, hikers, and many others continue to use the public amenities at the site, including the visitors center, the walking trails, wildlife observation opportunities, interpretive programs, and reservable meeting spaces.

Interpretive Services

Community Event Support

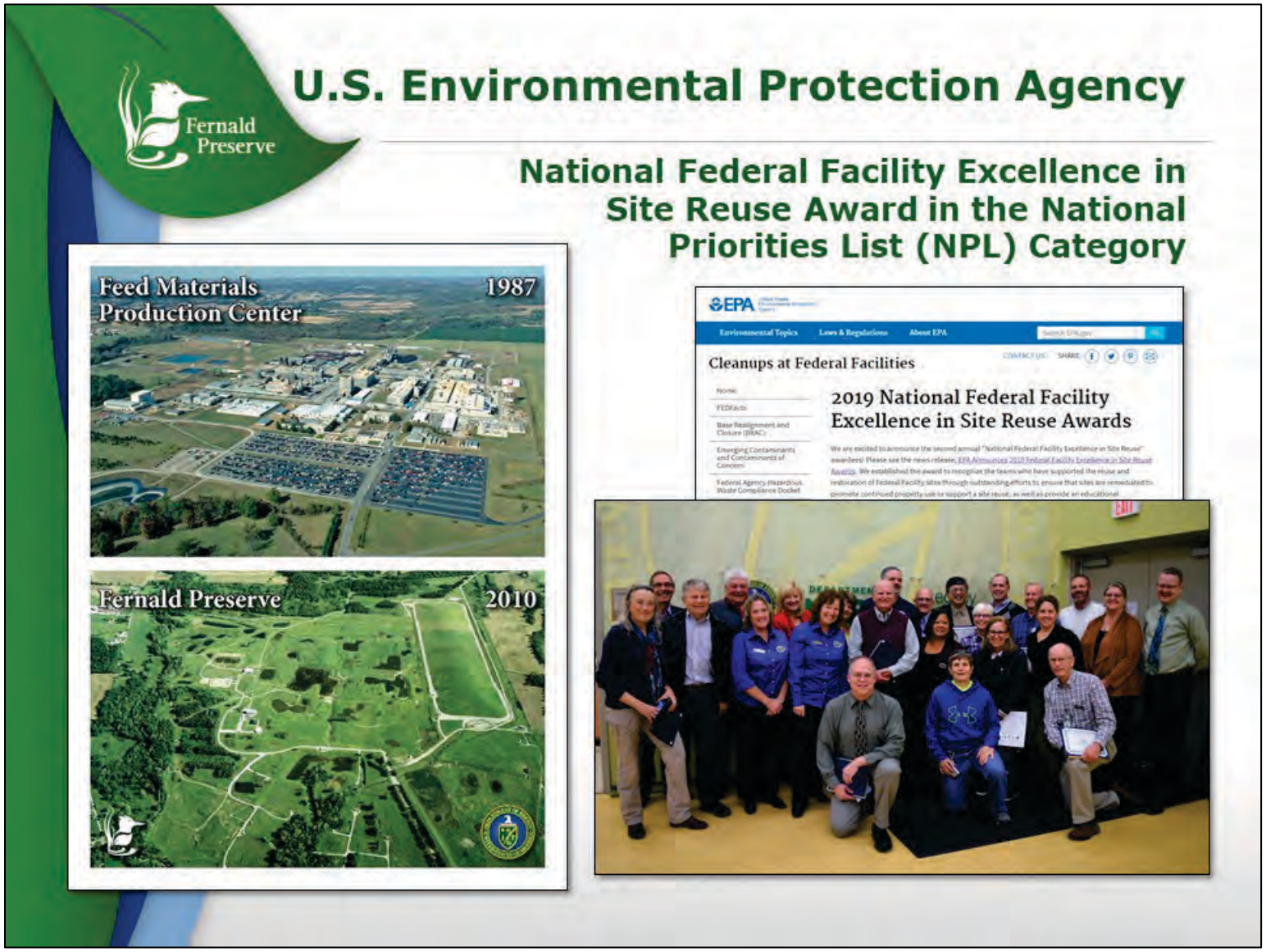
- Includes both on-site and off-site programming
  - National Day of Remembrance for Cold War Workers 2019
  - Three Valley Conservation Trust annual banquet and meeting
  - 2019 Regional Science Bowl Competition

Several community events were held at the site in 2019 and staff members supported additional community events at off-site locations.

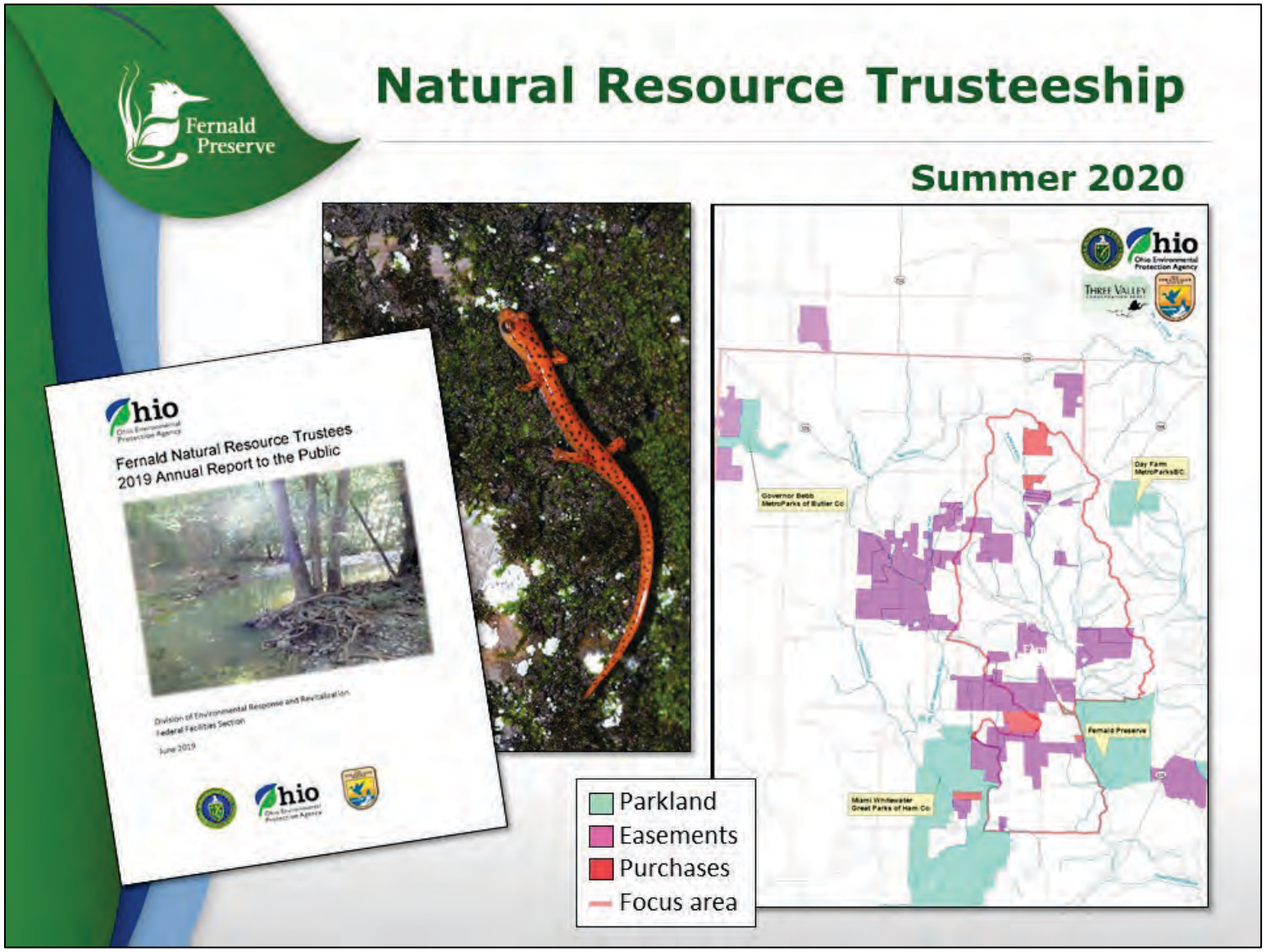
Public nature programs capture community interest. A variety of public programs and other activities were offered throughout the year.

Ecologically restored habitats, including the expansive prairie grasslands at the site, are recognized as regionally important birding areas that attract birds, bird watchers, and photographers.

Public programs featuring wildlife and history topics will be re-instituted after public engagement services re-start, date undetermined at this time due to COVID 19 closure. Information can be found here: https://www.energy.gov/lm/fernald-preserve-visitors-center



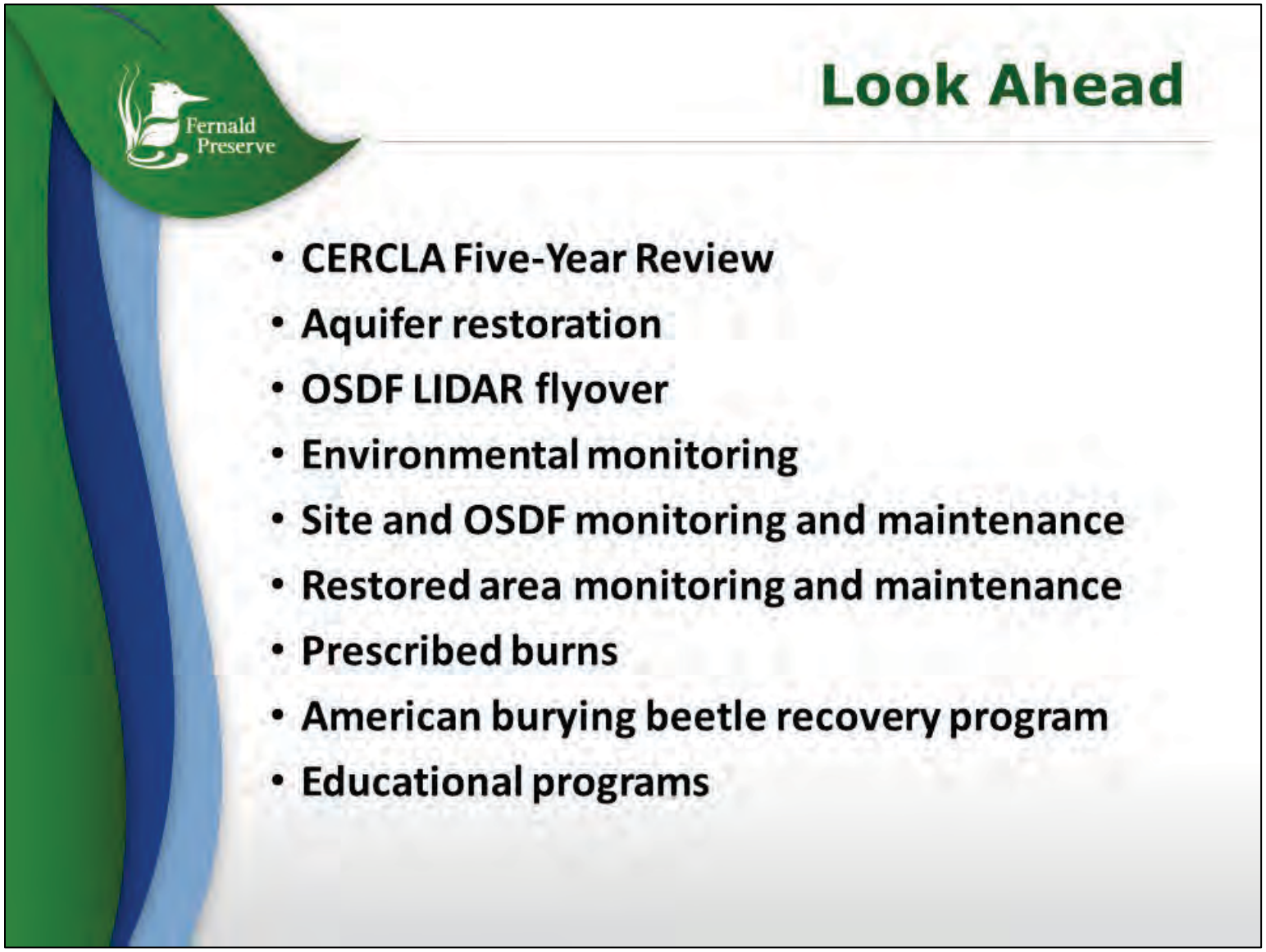
The Fernald Preserve was honored to receive the 2019 National Federal Facility Excellence in Site Reuse Award in the National Priorities List (NPL) sites category from the U.S. Environmental Protection Agency.



The Natural Resource Trustees — comprised of Ohio EPA, U.S. Fish and Wildlife Service, and DOE — have partnered with the Three Valley Conservation Trust to purchase conservation and agriculture easements in the Paddys Run watershed and above the associated Great Miami Buried Valley Aquifer.

The Fernald Natural Resource Management Plan (NRMP) has been drafted as an update to the site Restored Area Maintenance Plan. The NRMP describes how ecological monitoring and maintenance will be conducted at the Fernald site.

Refurbishment of the Converted Advanced Wastewater Treatment Plant Backwash Basin was completed in December 2019.



Numerous work activities are planned for 2020.

The next annual Fernald Preserve community meeting will take place in fall 2021.