



**Department of Energy**  
Washington, DC 20585

**PROD 7534**

November 29, 2016

Mr. David Seely  
U.S. Environmental Protection Agency  
Region 5 (SRF-6J)  
77 W. Jackson Blvd.  
Chicago, IL 60604-3590

Mr. Thomas A. Schneider  
Ohio Environmental Protection Agency  
401 East 5th Street  
Dayton, Ohio 45402

Dear Mr. Seely and Mr. Schneider:

Subject: Transmittal of Responses to Ohio Environmental Protection Agency  
Comments on the 2015 Fernald Preserve Site Environmental Report

References: 1) Letter, T. Schneider to S. Smiley, "Comments-Fernald Preserve 2015 Site  
Environmental Report, Dated May 2016," dated August 5, 2016  
2) Letter, S. Smiley to D. Seely and T. Schneider, "Transmittal of the 2015  
Annual Site Environmental Report," dated May 31, 2016

Enclosed for your review is the U.S. Department of Energy, Office of Legacy Management (DOE-LM) response to Ohio Environmental Protection Agency (Ohio EPA) comments on the 2015 Fernald Preserve Site Environmental Report (Reference 1). The Site Environmental Report was provided to the U.S. Environmental Protection Agency (EPA) and Ohio EPA on May 31, 2016 (Reference 2) and published as final to the Fernald Preserve stakeholders on the same day.

During the November 17, 2016 Fernald regulatory meeting, the EPA stated that the Ohio EPA comments on the 2015 Site Environmental Report sufficiently addressed regulator concerns. Therefore, consistent with practice in previous years and with discussion at the November 17<sup>th</sup> meeting, the 2015 Site Environmental Report and associated appendixes will not be revised. Comments will instead be considered during preparation of the 2016 Fernald Preserve Site Environmental Report.




Mr. David Seely  
Mr. Thomas Schneider  
Page 2

If you have any questions regarding the attached response to Ohio EPA comments on the 2015 Site Environmental Report, please call me at (513) 648-3333. Please send any correspondence to my attention at:

U.S. Department of Energy  
Office of Legacy Management  
10995 Hamilton-Cleves Highway  
Harrison, OH 45030

Sincerely,

A handwritten signature in black ink that reads "Susan Smiley". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Susan Smiley  
Fernald Preserve Manager  
DOE-LM-20.2

Enclosure

cc w/enclosure:  
S. Helmer, ODH  
B. Hertel, Navarro  
G. Hooten, DOE  
J. Homer, Navarro  
K. Voisard, Navarro  
C. White, Navarro  
Project Record File FER030.1(A) (thru M. Korte)  
rc-ohio

**RESPONSE TO OHIO EPA COMMENTS  
DATED AUGUST 5, 2016  
ON THE FERNALD PRESERVE  
2015 SITE ENVIRONMENTAL REPORT  
MAY 2016**

1. **Commenting Organization:** Ohio EPA

**Section:** 3.1                   **Pg#:** 33 and Figure 11

**Comment:** In the last paragraph of page 33 in the Summary of the Nature and Extent of Groundwater Contamination, please provide additional clarification concerning Figure 11. The discussion explains that the uranium plume depicted is the area within the 30 ug/L FRL. Additional text and a legend item are recommended to explain that the referenced "modules" (cross-hatched areas) are the three (3) areas of active ground water extraction.

**Response:** DOE agrees.

**Action:** In future reports, DOE will add text to explain that the cross-hatched areas represent the approximate location of the active restoration modules involved in the groundwater remedy.

2. **Commenting Organization:** Ohio EPA

**Section:** 3.3                   **Pg#:** 39

**Comment:** Ohio EPA recommends the third paragraph provide additional discussion concerning Figure 14. Specifically, the section should clarify that the screen type of each well is represented by the first digit of its ID number.

**Response:** DOE agrees.

**Action:** In future reports, additional text that explains the numbering system used for the monitoring wells and shown in Figure 14 will be added.

3. **Commenting Organization:** Ohio EPA

**Section:** 3.3.1.1                   **Pg#:** 45

**Comment:**

- a. Ohio Environmental Protection Agency (Ohio EPA) recommends future reports begin discussing the trend in uranium plume average concentration, area, and mass, to improve demonstration of remedy efficiency. Trends in average annual concentration, plume area, and mass can be obtained from regression line slope. In addition to comparing change from the previous year, an assessment of trend through time will improve projection of whether Final Remediation Level (FRL) attainment is on schedule.
- b. In this 2015 Site Environmental Report (SER), United States Department of Energy (U.S. DOE) began reporting change in uranium plume center of mass through time. The same gridding software now being used to track plume center of mass, Surfer, can be used to readily calculate the annual average concentration within the defined plume boundary, the FRL of 30 ug/L. Using Surfer, the plume's grid volume ( $m^2 \times ug/L$ ) can be divided by the plume's planar area ( $m^2$ ) to calculate the average concentration above the specified FRL plume boundary concentration (see [A Practical Method to Evaluate Ground Water Contaminant Plume Stability](#); Ricker, J.; Ground Water Monitoring and Remediation 28, no. 4, Fall 2008, pages 85-94). The resulting concentration should then be added to the FRL value of 30 ug/L to obtain the actual average concentration.

- c. In future reports, annual plume mass removed, reported as 519 lbs. in year 2015, should be compared to updated estimates of remaining uranium mass. One way to estimate remaining soluble mass is to multiply plume area (within the 30 ug/L FRL contour) by the average plume concentration, the plume thickness, and the aquifer porosity (A Practical Method to Evaluate Ground Water Contaminant Plume Stability; Ricker, J.; Ground Water Monitoring and Remediation 28, no. 4, Fall 2008, pages 85-94). Uranium cross-sectional profiles, such as the gridded profiles in Attachment A.2, should provide a useful means for estimating plume thickness and thereby calculating remaining soluble mass.

**Response:** DOE agrees that trending the average plume concentration, area, and mass annually in future SERs would improve the report by providing additional indicators on how the remedy is progressing. As suggested by Ohio EPA, using Surfer software and defining consistent calculation procedures will be important to maintain consistency between the calculations each year.

Mass calculations trends are currently reported in Attachment A.1, found in Appendix A of the SER using a different approach than the approach suggested in the comment. Regressions using measured uranium concentration data at the extraction wells are used to estimate future annual pounds of uranium to be removed from the aquifer and these estimates are compared to groundwater model predictions of the pounds of uranium that will be removed from the aquifer each year by maintaining the model design pumping target set points. The results are presented in Table A.1-24. The model predictions shown in Table A.1-24 are based on the initial Kriged uranium plume that was loaded into the model domain.

The procedure described in the comment for calculating the suggested metrics appears to be fairly straight forward; however, before committing to an additional annual reporting requirement, DOE will evaluate the scope of the work involved.

**Action:** DOE will use the approach recommended in the comment to determine an average plume concentration, area, and mass for the uranium plume and evaluate the scope of effort required to commit to this additional SER reporting requirement on an annual basis. Results will be shared with EPA and Ohio EPA before the next SER for 2016 is published. The added metrics, if adopted, would supplement the current mass calculations already being reported in Attachment A.1 of Appendix A of the SER.

4. **Commenting Organization:** Ohio EPA

**Section:** 3.3.1.5                      **Pg#:** 51

**Comment:** Regarding the statement that the uranium plume in excess of the FRL declined by 2.8 acres in year 2015, subsequent reports should discuss whether area decline rates are on target to meet the FRL in year 2035. The discussion should be supported with a chart, plotting plume area in excess of the FRL (30 ug/L) versus time. The trend and projected FRL attainment year should be discussed.

Should the reported decline rate of 2.8 acres per year (year 2015) remain steady into the future, then 38.6 years at a minimum would be needed for FRL attainment (108.1 acres divided by 2.8 acres/year). This is a concern because attainment would be achieved in year 2053 (year 2015 + 38.6 years) rather than year 2035 as projected in the O&M plan. Attainment could extend even further because mass removal rates typically decline rather than remain steady with time. As dissolved phase is removed through ground water extraction with time, the slow process of desorption will become increasingly dominant. Mass area decline rates should be expected to decline even further, as periphery extraction wells with fixed locations become progressively removed from the plume center of mass.

**Response:** As discussed below, DOE disagrees with the approach presented in the comment. Adding a discussion to future reports concerning the annual progress made in shrinking the area of the plume and if that annual progress is on target to meet modeled FRL predictions would be more involved than suggested in the comment.

The maximum uranium plume represents a worst-case interpretation of the area of the plume that is greater than 30 parts per billion (ppb). Progress in reducing the area of the plume varies from year to year and is often dependent upon the ability to collect a needed groundwater sample in a key location when water levels are at their highest levels.

For instance, in the 2012 SER, the reported decrease in 30 ppb uranium plume size between 2011 and 2012 was 13.97 acres. Projecting forward at this annual decrease rate provides a cleanup prediction between 2019 and 2020 (108.1 acres divided by 13.97 acres per year = 7.73 years, 2012 + 7.73 years = 2019 to 2020).

Attachment A.2.0 of the 2015 SER provides a table of the interpreted size of the uranium plume for the previous and current year. In future SERs, DOE will provide the changes that have been reported since 1997.

**Action:** In future SERs, DOE will present the plume size interpretations from 1997 to the present in Attachment A.2. This will provide a better assessment of the interpreted change in plume size as the remedy has progressed.

## Appendixes

### 1. **Commenting Organization:** Ohio EPA

**Section:** Appendix A, Attachment A.1                      **Pg#:** 2 and 41

**Comment:** Please address the discrepancy between the page 2, Section A.1.1 “updated model prediction cleanup date” for the waste storage area, compared to the label on page 41 map, Figure A.1-2. The table at the top of page 2 states that the updated FRL attainment year prediction for the waste storage area module is year 2032. Yet the Figure A.1-2 map label states the attainment year as 2033. The recent U.S. DOE Fourth Five Year Review report response to Ohio EPA comment projects an attainment year of 2035.

**Response:** The year 2032 reported in the table on the top of page 2 is correct. The “Updated Model Prediction Cleanup Dates” reported on page 2 correspond to the Baseline Modeling Alternative dates reported in the *Operational Design Adjustments-1, WSA Phase-II Groundwater Remedial Design, Fernald Preserve Report*. The Baseline Modeling Alternative is the 2005 Operational Design updated with the second half 2011 uranium plume concentrations. The “Updated Model Prediction Cleanup Dates” reported on page 2 correspond to the cleanup dates presented in the left half of Figure A.1-2 labeled “2005 Operational Design”.

The cleanup dates shown in the right half of Figure A.1-2 correspond to the Modified Baseline Modeling Alternative reported in the *Operational Design Adjustments-1, WSA Phase-II Groundwater Remedial Design, Fernald Preserve Report*. The Modified Baseline Modeling Alternative was modeled using the second half 2011 uranium plume concentrations and the new 2014 Operational Design. The 2033 cleanup date for the Waste Storage Area is correct.

It should be noted that modeling for the 2014 Operational Design change was conducted using second half 2011 uranium plume concentrations (essentially the uranium plume present at the start of 2012). The operational changes were not implemented until July of 2014, approximately 2 years later. To be conservative, reported cleanup dates include the extra 2 years between the date of the modeled uranium plume concentrations and the implementation of the operational changes. This accounts for the attainment year of 2035 reported in the *Fourth Five Year Review Report for the Fernald Preserve* response to Ohio EPA comments mentioned in the comment (2033 + 2 = 2035).

In responding to this comment, it was noted that Figure A.1-2 does contain a mistake. The cleanup date for the Southern South Field and South Plume on the right side of the figure, 2014 –Operational Design, should be 2020 not 2021. This date will corrected for future SERs.

**Action:** In future SERs, Section A.1.1 will be simplified and Figure A.1-2 will be changed to present only the current remedy design. The cleanup dates presented in Figure A.1-2 will be adjusted to reflect implementing the optimized remedy two years later than the modeling effort.

2. **Commenting Organization:** Ohio EPA

**Section:** Appendix B **Pg#:** B-4 and B-15

**Comment:** Please modify the Figure B-2 legend to clarify whether the two Great Miami River locations, G2 and G10, are the page B-4 referenced uranium sediment sample locations. Also, please provide additional justification to eliminate future uranium sediment sampling. Specifically, justification should address whether the river-bed sediments sampled are those most susceptible to sorption. Typically, fine grained, clay rich sediments, and organic rich sediments are much more susceptible to uranium sorption than sandy sediments.

**Response:** Two requests are made in this comment: 1) modify Figure B-2 and 2) provide additional information concerning uranium sediment sampling.

1. DOE agrees that adding the requested information to the legend would improve the figure. The normal protocol would be to make changes to the figure in next year's SER. However, as identified in Table B-3, DOE proposes to stop monitoring the four locations shown in Figure B-2. Because there are no comments indicating the proposed reduction is not acceptable, Figure B-2 will be eliminated from next year's SER.
2. Provide additional information concerning uranium sediment sampling. As described in Section 4.4.1.1 of the Integrated Environmental Monitoring Plan, efforts were taken when sampling sediments to obtain the most conservative sample possible (i.e., the sample that would be most susceptible to uranium sorption). For instance, sampling was scheduled in summer and fall to take advantage of the abundance of fresh sediment deposited during flood conditions that commonly occur in winter and spring seasons. Areas with a low flow rate were targeted because finer-grained material is deposited in areas with less energy. Also, samples were collected from the top two inches of sediment and consist of fine-grained material.

**Action:** No action required.

3. **Commenting Organization:** Ohio EPA

**Section:** Appendix D

**Pg#:** D-27 to D-38

**Line#:**

**Comment:** In the Inspection Findings tables D-13 through D-20 do these include findings from previous years inspections that were not resolved? Will any finding marked with "to be addressed" on these tables be listed in next years 2016 SER?

**Response:** The inspection findings listed in tables D-13 through D-20 are only those findings identified during the 2015 inspections. The tables do not include findings from previous years. An update of all inspection finding resolutions is included with each quarterly inspection report.

**Action:** No action required.



John R. Kasich, Governor  
Mary Taylor, Lt. Governor  
Craig W. Butler, Director

August 5, 2016

Ms. Sue Smiley  
Fernald Preserve Site Manager  
DOE-LM-20.2  
10995 Hamilton Cleves Highway  
Hamilton, Ohio 45030

Re: Fernald Preserve  
Remediation Response  
Project Records  
Remedial Response  
Hamilton County  
531000297

**Subject: Comments – Fernald Preserve 2015 Site Environmental Report, dated  
May 2016**

Ms. Smiley:

Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Fernald Preserve 2015 Site Environmental Report" dated May 2016. Ohio EPA's comments are enclosed.

If you have any questions, please contact me at (937) 285-6466.

Sincerely,

A handwritten signature in black ink, appearing to read "T. Schneider", written over a horizontal line.

Thomas A. Schneider  
Fernald Preserve Project Manager  
Division of Environmental Response and Revitalization  
Federal Facilities Section

TS/ljs

A handwritten signature in black ink, appearing to read "Bill Hertel", written over a horizontal line.

cc: Bill Hertel, Navarro, Incorporated  
Matt Justice, DDAGW, Ohio EPA-SWDO  
David Seely, US EPA





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4. Commenting Organization: Ohio EPA

Section: 3.3.1.5

Pg#: 51

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## Appendixes

1. Commenting Organization: Ohio EPA

Section: Appendix A,  
Attachment A.1

Pg#: 2 and 41

Line#:

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