



**Environmental  
Protection Agency**

ted Strickland, Governor  
Lee Fisher, Lt. Governor  
Chris Korfeski, Director

August 6, 2010

Ms Jane Powell  
Fernald Preserve Manager  
DOE-LM-20.1  
10995 Hamilton Cleves Hwy  
Harrison, Ohio 45030

**RE: OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE  
2009 FERNALD PRESERVE SITE ENVIRONMENTAL REPORT**

Ms Powell:

Ohio EPA has received (May 28, 2010) and reviewed the Fernald Preserve 2009 Site Environmental Report (SER). Ohio EPA was pleased with the changes incorporated into this edition of the report. Many of the Ohio EPA comments on the Fernald Preserve 2008 SER were addressed in the 2009 report. We had a very successful meeting with Fernald Preserve staff on August 3 to refine the attached comments. We look forward to continuing this dialogue as the LMIC and the 2010 SER are developed. Ohio EPA comments on the Fernald Preserve 2009 SER are attached.

If there are any questions, please contact me.

Sincerely,

Thomas A. Schneider  
Fernald Project Manager  
Office of Federal Facilities Oversight

cc: Tim Fischer, US EPA  
Frank Johnston, Stoller  
Mark Shupe, Geo Trans, Inc.

TS/ca

Ohio EPA Comments on:

**Fernald 2009 Site Environmental Report  
May 2010**

1. Commenting Organization: Ohio EPA  
Section #: 2.1 Pg #: 2-2 Line #: na  
Comment: The last bullet on the page states, "There were no instances of breaches...of the institutional controls..." A deer stand, along with associated materials was observed onsite during an inspection.
2. Commenting Organization: Ohio EPA  
Section #: 4.0 Pg #: 4-1 Line #: na  
Comment: The "Results in Brief" section notes that there was a 2% increase in uranium discharges in 2009. Neither the text nor the "Results in Brief" section explains the 2% increase.
3. Commenting Organization: Ohio EPA  
Section #: 5.0 Pg #: 5-1 Line #: na  
Comment: The last sentence of this section should be reworded. Concentrations were above background in 2006 and 2007 with same amount of surface contamination. The reason that concentrations are comparable to background is likely due to revegetation of the site preventing wind erosion of soils.
4. Commenting Organization: Ohio EPA  
Section #: 5.1 Pg #: 5-3 Line #: na  
Comment: The last sentence of section 5.1 noting the nesting of birds in AMS-8A would better fit in the "Air Monitoring Program Summary for 2009" rather than the "Activities Affecting the Air Pathway" section. The bird nest did not affect the air pathway, however, it did affect the monitoring of the air pathway.
5. Commenting Organization: Ohio EPA  
Section #: 5.4 Pg #: 5-6 Line #: na  
Comment: The last sentence on this page should be reworded to remove the phrase, "no significant dose". This phrase should be defined as indiscernible from background. Note that the maximum fence line appears to be 75% > Bkgd.
6. Commenting Organization: Ohio EPA  
Section #: 7.0 Pg #: 7-1 Line #:  
Comment: The reference to the "*Partial Consent Decree*" should be revised to "*Consent Decree*" as the name of the document was changed as a result of the public comment period and prior to finalization by the Judge Spiegel. This reference occurs elsewhere within the document including Appendix E and should be revised throughout.

## 2009 Environmental Summary (Appendices A through E)

### Attachment A.2

7. Commenting Organization: Ohio EPA  
Section #: A.2.3.2 Pg #: A.2-5/Figure A.2-48 Line #: Last paragraph  
Comment: Monitoring well 2900 had an FRL exceedance for uranium in 2009. Looking at Figure A.2-48 there appears to be an increase in uranium since 2003. DOE suggests that direct-push sampling will be done in the future if the uranium continues to increase. Have 2010 concentrations exceeded the FRL? If "yes", has a direct push sampling work plan been drafted to address the FRL exceedance?
8. Commenting Organization: OEPA  
Section #: Attach. A.2 Pg #: A.2-6 Line #: 17  
Comment: The average pumping rate for 2009 was 252 gpm.
9. Commenting Organization: Ohio EPA  
Section #: Table A.2-4 Pg #: A.2-15 Line #: na  
Comment: Consider adding a key or footnote to spell out the abbreviations used in this table.

### Attachment A.5

10. Commenting Organization: Ohio EPA  
Section #: A.5.1.1 Pg #: A.5-3 Line #: na  
Comment: Fernald should consider installing their own precipitation monitoring to be used instead of data from Butler County airport. Differences of a few inches and especially daily differences due to measurement location may influence the interpretation of data reported at the site.
11. Commenting Organization: OEPA  
Section #: Attach. A.5 Pg #: A.5-7 Line #: 29  
Comment: As noted, the parameter selection process was applied to Cell 1, 2, and 3 LCS data and was reported in the 2007 SER. Cell 1, 2, and 3 LCS data collection for Appendix IX and PCBs continues. For parameters that have been detected more than 25 percent detected values, DOE should calculate and report trends to verify the assumption that leachate concentrations for these parameters are either stable or decreasing. Any Cell 1, 2, and 3 parameters with increasing detection frequencies or upward trends will require retesting using the parameter selection process.
12. Commenting Organization: OEPA  
Section #: Attach. A.5 Pg #: A.5-8 Line #: 10  
Comment: In accordance with Figure 3-3 of Appendix E of the Groundwater Leak Detection and Leachate Monitoring Plan, the text should be revised to indicate that a non-parametric method (Wilcoxon rank sum test) will be used if the number of detections for an analyte is between 50 and 85 percent.

13. Commenting Organization: OEPA  
Section #: Attach. A.5 Pg #: A.5-8 Line #: 10  
Comment: In accordance with Figure 3-3 of Appendix E of the Groundwater Leak Detection and Leachate Monitoring Plan, the text should be revised to indicate that an approved non-parametric method will be used if the number of detections for an analyte is greater than 50 percent.
14. Commenting Organization: OEPA  
Section #: Attach. A.5 Pg #: A.5-8 Line #: 10  
Comment: It should be noted that although data set normality is not required for application of the Wilcoxon rank sum test, there are several assumptions critical to the appropriate application of this test, namely, that both populations being compared follow the same (not necessarily known) distribution and that both population variances are equal.
15. Commenting Organization: Ohio EPA  
Section #: A.5.2.5 Pg #: A.5-9 Line #: na  
Comment: The last sentence on the page states that parameters list should be adequate to detect a leak from the facility. An explanation as to why these parameters might be able to detect a leak is appropriate here. Are these parameters typically mobile in solution? Typical of C&D landfill parameters? Etc.
16. Commenting Organization: OEPA  
Section #: Attach. A.5 Pg #: A.5-10 Line #: 16  
Comment: The Poisson prediction limit statistical analysis was unable to distinguish differences in the background and LCS samples because of bias introduced through the handling of non-detects. The conclusions stated in the referenced text regarding LCS technetium-99 concentrations in comparison to background are unreliable.
17. Commenting Organization: OEPA  
Section #: Attach. A.5 Pg #: A.5-10 Line #: 39  
Comment: In accordance with the Poisson prediction limit testing procedure described in *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (EPA, 1992)*, non-detects are handled by substituting half of the detection limit for the concentration of technetium-99 in the prediction limit calculation. Using the value of 15 pCi/L for all non-detects creates a positive bias in the background calculation which results in a bias against rejecting the null hypothesis. At a minimum, therefore, the analysis should be redone using half the detection level for non-detects. In addition, because of problems identified with the Poisson prediction limit test (Loftis et al, 1999), DOE should use an alternative method to test the technetium-99 data against background.

18. Commenting Organization: OEPA  
Section #: Attach. A.5 Pg #: A.5-10 Line #: 33  
Comment: Loftis et al. (1999) indicate that problems exist with the Poisson prediction limit procedure indicated in EPA (1992). They show that this approach is inappropriate for modeling concentration data since the Poisson distribution does not scale appropriately with changing units of measurement. When sufficient background concentration data is available, other non-parametric procedures should be used. Accordingly, given that 29 technetium-99 samples constitute the background dataset for perched groundwater, ample background is available. More up-to-date EPA guidance (*Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance [EPA, 2009]*) recommends that the Tarone-Ware two-sample test be used for the comparison of two samples with many non-detects. DOE should use this method to reanalyze the technetium-99 data.
19. Commenting Organization: Ohio EPA  
Section #: A.5.2.7 Pg #: A.5-11 Line #: na  
Comment: (Aquifer Groundwater Background Data) The assignment of an arbitrary value of 15 pCi/L for nondetect data of Tc-99 appears to be inappropriate for statistical analysis. The use of the actual result should usually be used or the MDA. An explanation of the use of 15 pCi/L is requested.
20. Commenting Organization: Ohio EPA  
Section #: A.5.3 Pg #: A.5-13 Line #: last paragraph  
Comment: The Fernald Preserve website, <http://www.lm.doe.gov/fernalld/Sites.aspx> does not allow the user to access the inspection reports as of Jul 30, 2010. In general, the site websites are not easy to navigate and it is difficult to access information. A better description of how to access specific information from the website should be included in this report.
21. Commenting Organization: Ohio EPA  
Section #: A.5.4 Pg #: A.5-14 Line #: na  
Comment: (Performance/Findings) Bullet 1: The fact that the engineered drainage features produce data that meets the design criteria does not mean the cell is not leaking. Water quality data could be interpreted as indicating the OSDF is leaking.
22. Commenting Organization: Ohio EPA  
Section #: A.5.4 Pg #: A.5-14 Line #: na  
Comment: (Performance/Findings) Bullet 7: The fact that a result is less than CRDL is an administrative qualifier for data. It has no bearing on the integrity of the result. Mentioning that a result is less than CRDL is not necessary in a report as the SER.

23. Commenting Organization: Ohio EPA  
Section #: Table A.5-5 Pg #: A.5-21 Line #: na  
Comment: The detection limit for Tc-99 appears too high for the intended use of the data. Ohio EPA suggests that the RDL for Tc-99 be lowered to reflect the need for environmental measurements of Tc-99 for leak detection purposes. (Comment refers to this table and all subsequent Tc-99 result tables).
24. Commenting Organization: OEPA  
Section #: Attach. A.5 Pg #: A.5-34 Line #: NA  
Comment: The top left decision box on this figure (Fig. A.5-5B) should read "Do Datasets Contain <15% and ≥50% Non-Detects?"
25. Commenting Organization: Ohio EPA  
Section #: A.5.1 Pg #: A.5.1-1 Line #: na  
Comment: DOE may want to consider calculating liner efficiencies quarterly rather than monthly to correlate with quarterly water quality data. (Comment applies to all cells).
26. Commenting Organization: Ohio EPA  
Section #: A.5.1.1 Pg #: A.5.1-1 Line #: na  
Comment: The phrase used to describe GMA water concentration, "...due to fluctuating background concentrations", is inaccurate. The GMA wells in the vicinity of the OSDF do not reflect background aquifer concentrations. Ohio EPA suggests that the phrase be changed to state that the increasing trends in concentrations may be due to fluctuations in ambient concentrations.
27. Commenting Organization: OEPA  
Section #: Attach. A.5 Pg #: A.5.1-1 Line #: 37  
Comment: The use of the term "average" here and in similar text both in this section (Section A.5.1) and the other seven OSDF sections should be changed to language that is less specific. A better term to use would be "typical." Necessarily, these sections discuss detailed statistical analyses. Because of this, the way this term is used is misleading because, in a strict technical sense, it implies specific assumptions regarding variance and distribution are valid for the data sets from the various monitoring horizons. As has been demonstrated, the data from these horizons are usually right-skewed. The resulting arithmetic averages calculated from the sample data are frequently distorted by extreme values and therefore will be unreliable for drawing comparisons between the horizons.
28. Commenting Organization: OEPA  
Section #: Attach. A.5 Pg #: A.5.1-2 Line #: 9  
Comment: Removing the early boron data is a reasonable approach, given the site conditions and the length of the period of record since the upward trend dissipated. Please note, however, that estimates of distributional parameters rely on a stationary (that is, non-trending) mean. It is assumed that the normal distribution referred to for the down-trending data was determined using the boron residuals obtained from a computed trend through the data.

29. Commenting Organization: OEPA  
Section #: Attach. A.5 Pg #: na Line #: na  
Comment: There appears to be a discrepancy in the way the data is being reported on the site data base. Two database fields, "LAB\_QUALIFIERS" and "DATA\_VALIDATION\_QUALIFIERS" are inconsistent with previous data entries. Some of the data was collected under DOE-EM and some of the data has been collected under DOE-LM. The use of these two fields during these management periods are different and causes confusion; as well as, different interpretations of the data. Below are three comments illustrating these issues.

Section #: Attach. A.5 Pg #: A.5.1-3 Line #: 4  
Original Comment#

Comment: The text is incorrect in stating that Table A.5.1-3 shows annual LCS sampling results for all parameters "ever" detected. It is missing the six parameters that Table A.5.1-2 indicates are detected in the LCS (total uranium, sulfate, total organic carbon, total organic halogens, boron, and lithium). In addition, a review of the Cell 1 LCS data from the site database indicates that there are 116 parameters with at least one detect (thus qualifying as "ever" being detected). At a minimum, the table should include all analytes that have ever exceeded perched water background or the FRL. This same comment applies to equivalent tables for the seven other cells (Tables A.5.2-3, A.5.3-3, A.5.4-3, A.5.5-3, A.5.6-3, A.5.7-3, and A.5.8-3). The numbers of detected parameters listed in these tables range from 23 to 29 while the database shows that the numbers of detected parameters ranges from 116 to 118. DOE should explain this inconsistency.

Section #: Attach. A.5 Pg #: Fig A.5.4-3 Line #: 21

Comment: The text indicates that statistics were run on nine parameters but does not discuss how these nine were chosen. A cursory evaluation of the site database suggests that many more parameters were sampled at least eight times and were detected in more than 25 percent of the samples. For example, trichloroethene was detected in four out of 15 samples for a detection frequency of 26 percent. The list of  $\geq 25$  percent detects includes approximately 13 other chlorinated VOCs as well as other parameter types. DOE should summarize all parameters that meet the threshold for consideration as a monitoring parameter and provide the rationale for excluding any of these parameters from statistical screening.

Section #: Attach. A.5 Pg #: Fig A.5.5-3 Line #: 26

Comment: The text indicates that statistics were run on 10 parameters but does not discuss how these 10 were chosen. A cursory evaluation of the site database suggests that many more parameters were sampled at least eight times and were detected in more than 25 percent of the samples. For example, 1,1-dichloroethane was detected in three out of nine samples for a detection frequency of 33 percent. The list of  $\geq 25$  percent detects includes approximately 18 other chlorinated VOCs as well as other parameter types. DOE should summarize all parameters that meet the threshold for consideration as a monitoring parameter and provide the rationale for excluding any of these parameters from statistical screening.

30. Commenting Organization: Ohio EPA  
Section #: Figure A.5.1-22 Pg #: A.5.1-27 Line #: na  
Comment: Provide a detailed explanation of the CUSUM control charts explaining what each of the lines represent, such as, "h", "SCL", "CUSUM", "Standardized Mean", etc.
31. Commenting Organization: Ohio EPA  
Section #: A.5.2.1 Pg #: A.5.2-2 Line #: na  
Comment: The statement, "Arsenic is not detected in the LDS of Cell 2", is inaccurate. The LDS of Cell 2 was not sampled. It is dry.
32. Commenting Organization: Ohio EPA  
Section #: Table A.5.2-3 Pg #: A.5.2-7 Line #: na  
Comment: What is the definition for "Z" qualified data?
33. Commenting Organization: Ohio EPA  
Section #: Figure A.5.2-2 Pg #: A.5.2-9 Line #: na  
Comment: The figure indicates water in the Cell 2 LDS in 2006. Previous text indicates that Cell 2 LDS has been dry since 2005. Correct accordingly.
34. Commenting Organization: Ohio EPA  
Section #: Figure A.5.2-2 Pg #: A.5.2-11 Line #: na  
Comment: Put the upgradient and downgradient GMA wells on the same figure when showing uranium concentrations. (Comment applies for all cells).
35. Commenting Organization: Ohio EPA  
Section #: Figure A.5.2-21 Pg #: A.5.2-27 Line #: na  
Comment: Provide sample dates for the two closest data points on the bivariate plot.
36. Commenting Organization: Ohio EPA  
Section #: Figure A.5.3-2 Pg #: A.5.3-9 Line #: na  
Comment: The figure indicates water in Cell 3 LDS, the text states that it was dry. Correct accordingly.
37. Commenting Organization: Ohio EPA  
Section #: Figure A.5.3-21 Pg #: A.5.3-27 Line #: na  
Comment: Provide sample dates for the two closest data points on the bivariate plot.
38. Commenting Organization: Ohio EPA  
Section #: A.5.4.2 Pg #: A.5.4-2 Line #: last paragraph  
Comment: Cell 3 is referred to in this paragraph where this section is on Cell 4. Correct the typo.

39. Commenting Organization: Ohio EPA  
 Section #: Figure A.5.4-4 Pg #: A.5.4-11 Line #: na  
 Comment: There appears to be a correlation between water level and uranium concentration. A bivariate plot may be appropriate for trending upgradient and downgradient GMA wells. This may be a useful tool in evaluating fluctuating uranium concentrations. This plot is not necessary to be included in the SER.
40. Commenting Organization: Ohio EPA  
 Section #: Figure A.5.4-29 Pg #: A.5.4-31 Line #: na  
 Comment: Iron results appear "out of control". An explanation is warranted.
41. Commenting Organization: Ohio EPA  
 Section #: Figure A.5.6-14A Pg #: A.5.6-20 Line #: na  
 Comment: The iron results appear to be very chaotic. Explain the high variability in the results.
42. Commenting Organization: Ohio EPA  
 Section #: A.5.7.1 Pg #: A.5.7-2 Line #: 1<sup>st</sup> & 2<sup>nd</sup> paragraphs  
 Comment: The text is referring to Cell 5, where it should refer to Cell 7. Please correct.
43. Commenting Organization: Ohio EPA  
 Section #: Figure A.5.7-21 Pg #: A.5.7-27 Line #: na  
 Comment: Provide dates for the three LCS results that appear to be different from the rest of the data points.
44. Commenting Organization: OEPA  
 Section #: Attach. A.5 Pg #: Fig A.5.8-7 Line #: NA  
 Comment: This figure shows a plot of total uranium concentrations and water levels for Cell 8 Downgradient Monitoring Well 22216/22217. From the title, therefore, data from two wells should be displayed. Only data from one well is plotted, however. DOE should clarify what well is plotted on this figure. In addition, it is unclear where Well 22216 is and what the relevance of this well is to Cell 8.

Appendix B

45. Commenting Organization: Ohio EPA  
 Section #: B.2 Pg #: B.2-1 Line #: last paragraph  
 Comment: The FRL for uranium in sediment is 210 mg/kg. Please change the 200 to 210.

Appendix C

46. Commenting Organization: Ohio EPA  
Section #: C.1.1 Pg #: C.1-7 Line #: na  
Comment: The fact that site soils have been remediated to below FRLs is one reason the air concentrations are indistinguishable from background. The primary reason, however, is that vegetative cover on the site is preventing wind erosion of soils. See air monitoring results from 2006-2008. The soil concentrations have not changed over the past three years.
47. Commenting Organization: Ohio EPA  
Section #: C.3.0 Pg #: C.3-1 Line #: na  
Comment: Ohio EPA suggest that DOE consider measuring precipitation data onsite. Local data may be useful in interpreting SSOD data as well as OSDF data.

Appendix E

48. Commenting Organization: Ohio EPA  
Section #: E.1.0 Pg #: E-2 Line #: na  
Comment: Revise "*National*" to "*Natural*".

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References

- EPA, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530-R-09-007, March 2009.
- EPA, 1992. Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance, Draft, July 1992.
- Loftis, J.C., Hariharan, K.I, and Baker, H.J., 1999. Rethinking Poisson-Based Statistics for Ground Water Quality Monitoring, Ground Water, Vol. 37, No. 2, p. 275-281.