R-010-207.8

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EE/CA WASTE PITS - #2
U.S. DOE FERNALD
OH6 890 008 976

DOCUMENT DATE 07-02-90

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Pat Hopper

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Carr
Shirley
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Hopper

July 2, 1990

Mr. Bobby Davis
U.S. Department of Energy
Feed Materials Production Center
P.O. Box 398705
Cincinnati, Ohio 45239-8705

RE: EE/CA Waste Pits - #2
U.S. DOE Fernald
OH6 890 008 976

Dear Mr. Davis:

On February 2, 1990, the United States Department of Energy (U.S. DOE) submitted a preliminary version of a draft Engineering Evaluation/Cost Analysis (EE/CA) for a removal action (#2) for the control of contaminated storm run-off in the waste pit area of the Feed Materials Production Center (FMPC) site in Fernald, Ohio. The United States Environmental Protection Agency (U.S. EPA) provided comments on this preliminary draft on May 1, 1990, in order to provide guidance for the development of the draft that was submitted to U.S. EPA on May 30, 1990.

U.S. EPA has reviewed the May 30, 1990 draft EE/CA for removal #2 and is disapproving the document. The following deficiencies have been identified:

GENERAL COMMENTS

1. Overall, the EE/CA presents several viable alternatives for the removal of contaminated storm water run-off; however, the text lacks sufficient technical information for the sound and defensible selection of an alternative. The selected alternative is not supported by the EE/CA. The selected alternative essentially consists of collecting contaminated storm run-off and discharging it into the Great Miami River with little or no treatment, as stated in Section 5.0 page 17 of 25:

"As previously cited, only a maximum 10 percent uranium removal efficiency can be expected as a result of

settling in the biodenitrification surge lagoon. The degree of uranium removal in subsequent treatment units is unknown. Rather than actually being treated, the uranium is essentially being routed to the Great Miami River without first passing through Paddy's Run."

2. The major areas of the EE/CA that require more detailed information include the status and design information of the proposed advanced wastewater treatment (AWWT), status of the NPDES permit, applicable State and Federal standards and criteria, and design and cost analysis.

3. The EE/CA states that the AWWT facility will be added to the system to increase the uranium removal prior to discharge to the Great Miami River. However, the few and ambiguous statements about the proposed AWWT facility cannot support the selection of this alternative. Additional information needed to evaluate the alternative includes the volume of water to be treated, the level of treatment to be attained, and the time until this treatment facility can be brought on line. Until this facility is operational, it is misleading to refer to the preferred alternative as collection and treatment; it should be considered collection and discharge.

4. The objective of the removal action is stated in several different ways in the EE/CA. This discrepancy should be clarified. U.S. EPA does not view the purpose of this removal action to be a way of diverting contaminated water into another area.

5. The alternative selected in the EE/CA for the south plume also included the discharge of untreated water to the Great Miami River. The current release rates from the FMPC to the Great Miami River exceed the DOE-derived discharge limit by 15 percent. Therefore, selecting another alternative that will only add to the uranium loading in the Great Miami River does not appear to be environmentally sound. In addition, the concentration of uranium in storm water run-off after treatment through biodenitrification surge lagoon will probably exceed the current limit. This assumes that the uranium concentration cited in the EE/CA for untreated storm water run-off (1,700 g/L) is decreased by the 10 percent stated removal efficiency after treatment (settling of particulates).

6. The EE/CA should also address the potential for exposure to receptors via inhalation and ingestion of contaminated airborne particulate. Although not a

specific objective of this removal action, the potential for airborne particulates may have an significant impact on the effectiveness of the various alternatives.

7. The derivation of health risk estimates is not sufficiently developed in the document. Adherence to EPA's Risk Assessment Guidelines for Superfund would reduce much of the ambiguity regarding data preparation and calculation.

8. The EE/CA should stand alone for justifying the selection of the best remedy within the time constraints of the need for initiation of the removal action. All assumptions in the EE/CA must be explained and reliance on other documents must be justified and referenced. Copies of referenced materials should be provided with the EE/CA submittal.

9. The National Contingency Plan (NCP) mandates that actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) response actions be protective of human health and the environment. In selecting a protective remedy for toxicants, the remedy must not cause any immediate or long term adverse health effects. For carcinogens, the remedy must not cause any excess lifetime cancer risks in excess of 1x10-6. In addition, the remedy must meet Applicable or Relevant and Appropriate Requirements (ARARs) and should consider criteria and policy, such as To Be Considered (TCBs) requirements. The EE/CA does not satisfactorily address the protectiveness issue and is required to be revisited. Most of the analysis relies on the derived concentration guides (DCGs) from draft U.S. DOE guidance. The risks must be analyzed in accordance with U.S. EPA guidance including the "Superfund Compliance With Other Laws Manual" and the "Superfund Public Health Evaluation Manual".

10. The EE/CA must address the potential for exposure to receptors via inhalation and ingestion of contaminated airborne particulates.

11. Lining of the water collection system needs to be further evaluated in the EE/CA.

SPECIFIC COMMENTS:

12. Section ES, Page 1, Paragraph 4: The run-off surface 3,

areas around the storage silos are also included in this EE/CA.

13. Section ES, Page 2, Paragraph 2: The statement concerning sporadic excesses of established concentration guidelines is misleading. This statement indicates that an acceptable standard has been used and that the levels of contamination are only occasionally unacceptable.

14. Section ES, Page 2, Paragraph 1: Non-time critical removal actions are those which are initiated in response to a release or threat of a release that poses a risk to public health or the environment such that initiation of the response action may be delayed six months or more following approval of the action memo.

15. Section ES, Page 2, Paragraph 3: Further justification for excluding alternatives 3 and 5 before evaluation must be provided.

16. Section ES, Page 2, Paragraph 3: The EE/CA states that "the fundamental objective of the removal action is to protect public health and the environment by controlling the release of run-off with uranium concentrations exceeding the proposed U.S. DOE DCGs for surface water discharge." As discussed throughout this letter, the DCGs are not the only criteria with which to select the remedy. Evidence that the DCGs are considered protective under CERCLA is not presented. Additionally, the objective is defined too narrowly.

17. Section ES, Page 2, Paragraph 4: Study of the no action alternative is not required for removal actions.

18. Section ES, Page 3, Paragraph 4: The EE/CA should specify the mechanism to be used for segregating contaminated from uncontaminated run-off, how DOE will determine what is contaminated and whether specific sources can be identified.

19. Section ES, Page 3: The technical and cost considerations for the synthetic cap, compacted clay cap, and a cap that would meet current requirements of the Resource Conservation and Recovery Act (RCRA), must be presented.

20. Section ES, Page 4: A brief explanation should be provided to illustrate how capping will better satisfy overall environmental improvement by protecting "... the local environments downstream from the waste pit area and upstream from Paddys Run."

21. Section ES, Page 4, Paragraph 2: The EE/CA concludes that "... only the capping alternative and run-off collection alternative were judged to be effective and implementable as removal actions and to warrant further evaluation in the EE/CA." The increased effectiveness introduced by the lateral drainage collection system in Alternative 3 was not considered sufficient to off-set the increased cost and time required for installation. Also, while fully effective in meeting the removal action objectives, Alternative 5 far exceeds the scope of the other removal action alternatives and would satisfy the objectives to a comparable extent." The EE/CA provides insufficient support for these conclusions and this subject should further developed, with supporting documentation.

22. Section ES, Page 5, Paragraph 3: Use of the hypothetically maximum exposed individual is not in accordance with current risk assessment doctrine. A statistically supported, reasonable maximum exposed individual (RME) is the current accepted methodology (Risk Assessment Guidance for Superfund). (See previous comment regarding use of U.S. DOE DCGs.

23. Section ES, Page 5, Paragraph 3: See previous discussion regarding U.S. DOE DCGs.

24. Section ES, Page 5, Paragraph 4: A brief explanation should be provided to demonstrate how capping will better satisfy overall environmental improvement by protecting "...the local environments downstream from the waste pit area and upstream from Paddy's Run."

25. Section ES, Page 5, Paragraph 5: The text states that "The collection and treatment alternative is consistent with the final remedial actions for both the waste pits . . . and the regional environmental media." In order to make this determination, the text should also include the potential final alternatives under consideration.

26. Section ES, Page 5, Paragraph 5: CERCLA requires that removal actions contribute to the effective performance of long-term remedial actions to the extent practicable. This is only one of the factors required to be considered with respect to implementability. U.S. EPA's EE/CA guidance should be consulted. The alternative will not meet the removal requirement "to abate, ... a release or threat of release.

27. Section ES, Page 6: CERCLA provides for permit waivers for on-site activities, as long as substantive requirements of a permit are met. The site definition is defined by CERCLA and the 1990 Consent Agreement.

28. Section ES, Pages 6-7, Table ES-1: Please elaborate on the variety of special conditions that may require special considerations as stated under Alternatives 2 & 4, Implementability: Technical Feasibility.

29. Section ES, Pages 6-7, Table ES-1: Under Alternative 2, Public Health Effectiveness, the table states that "...all exposure pathways within acceptable risk limits." The concept of acceptability, however, is not defined in the Executive Summary.

30. Section ES, Page 8, Paragraph: The collection and treatment alternative will not mitigate the waste infiltration through the sides and bottoms of the waste pits.

31. Section ES, Page 8, Paragraph 6: The capping alternative will mitigate contaminant infiltration and transport, but would keep run-off from contacting the wastes. The collection and treatment alternative will do neither.

32. Section 1.0, Page 1, Paragraph 4: The NCP was finalized in April 1990; change April 1988 to April 1990 (55 Federal Register 8666).

33. Section 1, Page 2: The integration of National Environmental Policy Act (NEPA) requirements needs to be justified and explained.

34. Section 2.0: No topographic map of the waste pit area is included in this section. Therefore, it is difficult to fully evaluate the design changes discussed in this document. A topographic map of the waste pit area drawn to scale should be included. This is needed to provide the information necessary to properly evaluate the design changes that may be needed.

35. Section 2.1, Page 3: The discussion of the individual waste pits should include a figure showing the location of the 6 waste pits, the burn pit, and the clearwell. Figure 2-2 is inadequate for this purpose.

36. Section 2.1, Page 3: The discussion regarding the construction of the individual waste pits does not indicate that the native clay that comprises the bottom of these basins is not an engineered clay designed to

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permanently contain waste materials. The text should indicate the permeability characteristics of each pit description.

37. Section 2.0, Page 5, Paragraph 4: A full chemical analysis of the soil and waste materials in the bottom of the burn pit would seem appropriate based on this pit's functional history.

38. Section 2.0, Page 6, Paragraph 1: The statement that "...water of varying depth remains in the Clearwell at all times..." is confusing. The amount of discharge to and from the Clearwell needs to be presented.

39. Section 2.1, Page 6, Paragraph 2: The report should also note that the static water level in wells completed in the till indicated that the potential for ground-water movement is southwest towards Paddy's Run. Therefore, leachate can enter Paddy's Run by seeps and shallow ground-water discharge. Leachate can also enter the Great Miami aquifer by vertical movement through the till and infiltration of surface water from Paddy's Run to the aquifer.

40. Section 2.1, Page 6, Paragraph 4: The statement that storm run-off during major storm events may be discharged to Paddy's Run implies that this discharge is not tested prior to release, a violation of the NPDES requirements.

41. Section 2.1, Page 6, Paragraph 5: The first sentence indicates that storm water discharge from the Clearwell is regulated by an NPDES permit. However, the last paragraph on the previous page, states that NPDES-permitted discharge from the Clearwell was terminated. The status of discharge permits pertaining to the Clearwell should be clarified.

42. Section 2.1, Page 6, Paragraph 5: An appendix including the NPDES permit requirements for the facility would be appropriate.

43. Section 2.1, Page 6, Paragraph 5: It is not clear whether the phase "under one removal action" refers to the alternatives evaluated in this EE/CA or a EE/CA for another removal action at the site.

44. Section 2.1, Page 6, Paragraph 5: Pit 5, which discharges water to the Clearwell, contains RCRA hazardous waste Thus, the discharge may from Pit 5 to the Clearwell is not regulated under NPDES.

45. Section 2.1, Page 6, Paragraph 5: Although this pipeline was designed for pressure flow, the design was inadequate to handle the high river stage in the summer of 1989, resulting in the release of contaminated water at manhole 180. The EE/CA should indicate whether this discharge pipeline will be retrofitted.

46. Section 2.1, Page 6, Paragraph 5: The design of the discharged pipeline (see south plume EE/CA) is not adequate to handle 10 cubic feet per second (cfs). The minimum slope required to handle 10 cfs under gravity flow is approximately 2 percent.

47. Section 2.2, Page 7, Paragraph 2: The report should note that 660 pCi/L exceeds the U.S. DOE DCG limit of 550 pCi/L for total uranium by 20 percent.

48. Section 2.2, Page 7, Paragraph 2: The range of concentrations of uranium, as well as the average concentrations, should be referenced.

49. Section 2.2, Page 7, Paragraph 2: It is not clear what U.S. DOE orders are being referred to in this section. Since, U.S. DOE orders require daily sampling of radionuclides, summary information on the radionulcides other than uranium should be presented in the EE/CA. The range and detection limits should also be specified.

50. Section 2.2, Page 7, Paragraphs 3-4: The EE/CA should indicate the current status of the proposed advanced wastewater treatment (AWWT) facility and when it will be operational.

51. Section 2.2.1, Page 8, Paragraph 3: The one-year and ten-year 24-hour rainfall data should also be included.

52. Section 2.1, Page 8, Paragraph 4: Indicate whether the entire waste pit area is above the 100-year floodplain as described on Federal Emergence Management Administration (FEMA) maps and by the Corps of Engineers. Also indicate whether the diking engineered controls on this side of the facility were constructed to prevent flood level waters from entering the ancestral stream bed and thus undercutting the waste pits or increasing the contaminant load potential to the stream.

53. Section 2.2.2, Page 9, Paragraph 1: It is not clear how the discharge for Paddy's Run was calculated, since the text states that it is an ungauged, intermittent stream. The discharge data should be referenced.

54. Section 2.2.2, Page 9, Paragraph 2: A figure is needed showing the location of the storm sewer outfall ditch and Manhole 175.

55. Section 2.2.2, Page 9, Paragraphs 2-3: Retention basins may eliminate storm water runoff to the outfall ditch and Paddy's Run; however, uranium contamination is not removed by settling. This storm water runoff is still contributing uranium contamination to the Great Miami River.

56. Section 2.2.3, Page 10, Paragraph 2: A figure illustrating how the cone of depression affect groundwater flow should be presented.

57. Section 2.2.5, Page 13, Paragraph 4: The RI work being conducted for Operable Unit #5 should use the methods established in the "Biocriteria User's Manual". Ohio Water Quality Standards have biocriteria based on fish and invertebrate communities. For fish, the data collected should be evaluated using the Index of Biotic Integrity (IBI), which has been calibrated for Ohio streams. For invertebrates, the data collected should be evaluated using the Invertebrate Community Index (ICI). An invertebrate voucher collection must be established and verified by either U.S. EPA and OEPA. The study should also evaluate sediment toxicity.

58. Section 2.2.6, Page 13, Paragraph 2: Hamilton is a city (not a town) with a population of approximately 60,000. Furthermore, a significant portion of the city of Fairfield (population 40,000) is located within 5 to 6 miles of the FMPC. The estimated population surrounding the plant is based on a 5-mile radius from the center of the facility. However, a recent court ruling indicated that the 5-mile radius should be measured from the site boundaries. Thus, the estimated population within a 5-mile radius of the site is currently considered to be 30,000.

59. Section 2.3.1, Page 14, Paragraph 3: Based on Figure 2-4, surface water or surface soil samples were not collected in the drainage areas east of the waste pits but still within the K-65 waste pit area (i.e., Drainage Areas A and other undefined areas). None of these areas are considered in any of the alternatives and the report implies this surface water will discharge to Paddy's Run. Because this area has not been investigated and these areas may be contributing to contaminated storm water run-off, additional sampling should be conducted.

60. Section 2.3.1, Page 14, Paragraph 4: Twelve sampling locations are identified as being within the waste pit area. Table 2-1 (Westinghouse Data for Surface Water Runoff) shows results for only 11 sample locations. The data for location #12 is missing from Table 2-1, when compared to Figure 2-4 (Storm Water Runoff Sample Locations).

61. Section 2.3.1, Page 14, Paragraph 4: A discussion of detection limits and the meaning of the asterisk should be added to the footnotes in Table 2-2.

62. Section 2.3, Page 15: If Westinghouse analyzed samples for contaminants other than uranium, these should be included in Table 2-1.

63. Figure 2-4, Page 15: This figure is cluttered and difficult to read. The legend is incomplete, and no reference is provided. In addition, it is difficult to read and uses an unusual scale for an engineering drawing. Contour lines should be superimposed to show natural drainage patterns. It does not contain the ASI/IT sample location for ASIT-001. Two separate figures are recommended.

64. Figure 2-4, Page 15: This figure indicates that surface water or surface soil samples were not collected in the drainage areas east of the waste pits but still within the K-65 and waste pit area (i.e., drainage areas A and other undefined areas). None of these areas are considered in any of the alternatives. These areas need to be investigated because of the potential for them to be contributing to contaminated storm water run-off. The associated text should be modified and additional sampling proposed

65. Section 2, Pages 16-20: The sources of all data in Tables 2-1 through 2-4 should be properly cited in the Reference Section. Abbreviations in the tables (TOC, TOX, etc.) should be defined in the footnotes.

66. Table 2-1, Page 16: At certain sample locations, uranium concentrations vary considerably over time. For example, concentrations at location 27 range from 0.454 to 11.30 mg/L. The possible causes for this variability and the representativeness and comparability of the ASI/IT data should be discussed.

67. Section 2.3.1, Page 21, Paragraph 4: This paragraph is redundant. Additionally, the difference between

minimum detection limit and the method detection limit should be specified.

68. Section 2.3.1, Page 21, Paragraph 3: Sample locations are shown on Figure 2-4, not on Figure 2-2.

69. Section 2.3.2, Pages 21-27: For easier reference, it would be helpful to give sample numbers in the text.

70. Section 2.3.2.1, Pages 20-24: The analytical results presented in this section must include the range of concentrations detected, the location of the highest concentrations, any applicable limits including Safe Drinking Water Standards, Water Quality Standards, and NPDES permit requirements for each contaminant. It should be stated whether samples were analyzed for radon.

71. Section 2.3.2.1, Page 22, First paragraph: The use of the word "slightly" is inappropriate.

72. Section 2.3.2.1, Page 22: MCLs are not appropriate guidelines for comparison with run-off concentrations. Ambient Water Quality Criteria would be more suitable. If a specific exposure pathway is to be addressed, use a health-based number or a risk-derived concentration. Refer to Risk Assessment Guidance for Superfund for specific information.

73. Section 2.3.2.2, Page 22, Paragraph 1: TOX and TOC are analytical screening analyses. TOC values were reported to be 188 mg/L (188 ppm). Follow-up analysis should have been performed to further characterize the component organics reported in the TOC test.

74. Section 2.3.2.2, Page 22: The highest daily average concentrations detected for the four samples locations should be presented.

75. Section 2.3.2.3, Page 23, Paragraph 2: The word "somewhat" is not appropriate.

76. Section 2.3.2.3, Page 24: The conversions for piC/L to ppm needs to be presented.

77. Section 2.3.2.3, Pages 23-25: Section 2.3.2.3 (Radionuclides and Gross Radioactivity) discusses guidelines in terms of exposure to radioactivity. However, these compounds are also chemically toxic. This section should compare contaminant levels to non-radioactive toxicity guidelines.

78. Section 2.3.2.3, Page 23, Paragraph 6: The discussion of DCGs should either be expanded in this section or included as an appendix. This should include assumptions concerning exposure parameters, the calculations used to derive DCGs, and the basis for the DCG in terms of health risk. In addition, DCG's are not the sole criteria for setting appropriate site cleanup standards.

79. Section 2.3.2.3, Pages 24-25: In comparing DCGs for various uranium species with reported sampling results, only two of the four data sets (Weston and ASI/IT) are mentioned. The data from Dames & Moore and Westinghouse, which are presented in units of mg/L, are not compared with DCGs, which are in units of pCi/L. If it is assumed that one pCi of total uranium is equivalent to 1.5 g (as indicated in the South Plume EE/CA), and that the DCG for total uranium is approximately 550 pCi/L, then any level exceeding 825 g/L would violate the DCG standard. Given these assumptions, the data from Dames & Moore (Table 2-4) and Westinghouse (Table 2-1) clearly indicate that the level of contamination is more extensive than this section implies. This section would be clearer if the data were presented in comparable units. The discussion of exceedances of DCGs considers only the analytical data specifically for isotopic uranium and does not consider a DCG or an "effective DCG" for total uranium.

80. Section 2.3.2.3, Pages 24-25: Again, U.S. DOE DCGs are TCBs only, but the establishment of different derived concentration levels for removal actions versus final remediation must be justified. As presented here, DOE is using a 100-mrem/year exposure scenario for a projected pathway of run-off water used as a drinking water source, whereas a 50-year CEDE 4-mrem/year value was used for the South Plume groundwater. This is inconsistent with U.S. DOE 5400.5, which states that the CEDE limits shall apply to all off-site areas where water could be used as a drinking water source. It is reported in the EE/CA (p. 2-27) that the potential for contaminating drinking water supplies is relevant to this removal action. Therefore, the appropriate DCG should be 22 pCi/L rather than 550 pCi/L.

81. Section 2.3.2.3, Page 24, Paragraph 1: Dose equivalents should also be expressed as excess cancer risks, as suggested in the Risk Assessment Guidelines for Superfund. By consistently referring to U.S. DOE DCGs, the environmental effectiveness of alternatives (as defined by CERCLA in the NCP) is difficult to evaluate. 12

82. Section 2.3.2.3, Pages 23-26: Units (mg/L, pCi/L, and g/L) are not used consistently. The factor for converting between mg/L and pCi/L should be included in the text or an appendix.

83. Section 2.3.2.3, Page 25, Paragraph 2: The statement that "...the remaining ASI/IT samples ranged from 18 pCi/L to 365 pCi/L..." is misleading; only 8 of 13 samples were analyzed for Uranium 238. Furthermore, considering the relationship between total uranium concentration (in mg/L) and the activity concentration of Uranium 238 (in pCi/L), samples ASI/IT 27 and 28 would also exceed the DCG.

84. Section 2.3.2.3, Page 25, Paragraph 4: The EE/CA should also note that all the ASI/IT samples for gross alpha exceed the U.S. EPA Interim Drinking Water Standard.

85. Section 2.3.3, Page 26, Paragraph 1: Sample location DD-07 is cited as having the highest concentration of gross alpha and gross beta. However, the last sentence of this paragraph does not clearly indicate whether the source of this contamination is the waste pit area.

86. Section 2.3.3, Page 26, Paragraph 1: Sample location DD-07 is in the proximity of the waste pit area. While current drainage patterns may not indicate a connection, former patterns during pit construction and grading operations could have contributed waste materials directly to this area. Also, seepage laterally may be contributing to contamination in this area. The 1988 EPA-EPIC report documents the ancestral drainage patterns and should be used to evaluate historical waste pockets. The sample map as presented is useless for determining flow gradients and drainage pathways.

87. Section 2.3.3, Page 27, Paragraph 3: Rather than referring to Factors 1 and 2 as "secondary" justifications, it appears that they should be listed before Factors 4 and 5 since an actual release rather than a "threat of release" (Factor 4) has occurred.

88. Section 2.4, Page 28, Paragraph 1: The text refers to "natural drainage," but there are no topographic figures in the report that allow confirmation of drainage patterns.

89. Section 2.4.2, Page 28, Paragraph 3: Under "environmental fate" the text should mention the length of time that the radioactive contaminants at the site

remain hazardous. To put risks into perspective, data on half-lives of uranium and thorium isotopes should be included in this section. In addition, the specific properties of uranium (the contaminant of concern) should be discussed.

90. Section 2.4.3.1, Page 29, Paragraph 1: The text states that "all considered actions that account for public health and environmental protection will also provide protection against other radionuclides and chemicals, due to the low levels present." Although this statement is likely true given the quantities of wastes disposed in this operable unit, the text should provide some numerical comparison of these relative risks. The conclusion will be better supported, if for example, this comparison shows that the risks posed by uranium isotopes at the site far exceed (by several orders of magnitude or more) those posed by all other materials. Data must be presented to support these conclusions.

91. Section 2.4.3.1, Page 29, Paragraph 1: The statement that most radionuclides are at natural background levels is misleading. The text should indicate how normal background levels were established and what sampling locations were used.

92. Section 2.4.3.1, Page 29, Paragraph 2: Insoluble forms of uranium can also adsorb to clay or colloidal size particles and be ingested.

93. Section 2.4.3.2, Page 29, Paragraph 1: Ingestion of groundwater underlying Paddy's Run is a current exposure pathway, not a potential exposure pathway. The discussion of exposure pathways needs to consider inhalation of radon and its decay products that can be attributed to the waste pits.

94. Section 2.4.3.2, Page 29, Paragraph 1: The pathway discussion does not address environmental receptors such as indigenous plant and animal life in Paddy's Run. Further, recreational use of Paddy's Run and the Miami River, the contamination of sediments, and the additional receptors from these pathways are not addressed.

95. Section 2.4.3.3 Page 30: EE/CA should present information on the uses of groundwater downgradient from the site.

96. Section 2.4.3.2, Page 30, Continuing Paragraph: The statement that "...current releases...do not constitute an unacceptable level of risk..." is not defined in

terms of what is acceptable and what is not. Whether a release is within U.S. DOE guidelines should not be construed as the sole criteria for acceptability.

97. Section 2.4.3.2, Page 30, Paragraph 1: The statement that "...there is no known use of ground water for drinking water..." is misleading. Previous documents state that one of the sources of contamination to the south plume ground-water operable unit is infiltration of surface water from Paddy's Run. Ground-water users in this area now do not use the water because of the contamination.

98. Section 3.0, Page 1, Paragraph 1: Although not a principal objective, the elimination of potential release of contaminated airborne particulates should be investigated. Fugitive dust emissions can affect a large area and several receptors over a relatively short period of time.

99. Section 3.0, Page 1, Paragraph 1: The objective is to control stormwater run-off from the waste pit area.

100. Section 3.0, Page 1, Paragraph 3: Run-off from the Plant 1 drum storage pad contributes contaminants to both Paddys Run and the Great Miami River. Plant 1 storage pad run-off should be considered either under this removal action or accounted for as contamination in the FMPC storm sewer system.

101. Section 4.2.2, Page 2: Because several waste pits contain VOC-contaminated material, it may be appropriate to evaluate the potential build up of VOC vapors beneath the cap and the possible installation of a venting system.

102. Section 4.2.2, Page 2, Paragraph 2: The statement "...portions of the waste pit areas designed as Drainage Areas.." is not clear. The portions of each drainage area to be capped needs to be specifically identified.

103. Section 4.2.2, Page 2, Paragraph 2: The report should state why Drainage Area G will not be capped when sample location DD-07 was cited as one of the most contaminated area previously in the report. In addition, clarify the southern extent of Area G (is it west of the silos?).

104. Section 4.2.2, Page 2, Paragraph 2: As stated previously, Waste Pit 5 contains "listed" RCRA hazardous waste. The addition of flyash will create

additional RCRA waste because of the mixture rule causing administrative problems during future remedial actions.

105. Section 4.2.2, Page 2, Paragraph 2: The purpose of solidifying the wastes and capping waste pit 5 and 6 is not clear and the rationale should be discussed. The solidification of sludge and dewatering and capping of these pits does not fulfill the Removal Action Objectives in Section 3.0 because the report states (in Section 2.1) that "no storm water run-off of concern to this removal action originates from Waste Pit 5" or Waste Pit 6. Furthermore, this activity makes the capping alternative less cost effective.

106. Figure 2-4 shows the drainage areas, not figure 2-3.

107. Section 4.2.2, Page 2, Paragraph 1: This alternative includes capping Drainage Area F that, according to Figure 2-4, surrounds the K-65 silos. It is not clear how capping this area would be continuous with the other capped areas (D-E, J, and K). Furthermore, in Figure 4-1, no drainage patterns are shown around these silos, indicating that this area is not part of the capped area.

108. Figure 4-1, Page 3: Several contour lines on Figure 4-1 are improperly marked. In Zone 3, the flow arrows indicate outward flow; however, the inner contour line is 590 and the outer is 595.

109. Section 4.2.2, Page 4, Paragraph 1: The report needs to clarify two items concerning the infiltration rates. First, clarify why several areas between zones were not included in the HELP model. Second, explain why "natural topographic features" and "existing drainage contours" were used and not final design topography and drainage patterns. The use of existing topography, which is generally flatter than the proposed design grades, will result in greater estimates of surface water infiltration.

110. Section 4.2.2, Page 4, Paragraph 1: The results of the HELP model for the synthetic liner are noteworthy for Waste Pit 4, which underwent interim RCRA closure last year. The HELP model indicated that the synthetic cap allows approximately 0.5 inches of recharge a year into the waste pit.

111. Section 4.2.2, Page 4, Paragraph 1: The surface area of the drainage zones does not appear to be correct. For example, Zone 4 is listed as being 2.1 acres and Zone 3

is listed as 1.12 acres; however, from Figure 2-1, it appears that Zone 4 is 0.6 the size of Zone 3. This may have substantial ramifications for the HELP model as well as cost estimates. All area, volume, and rate parameters should be checked and consistent.

112. Section 4.2.2, Page 4, Paragraph 2: The volume of water infiltrating through the synthetic cap seems excessive. The infiltration of over 250,000 and 120,000 gallons of water through the clay and synthetic cap, respectively, is questionable. The mechanism of infiltration through a synthetic liner needs to be described.

113. Section 4.2.2, Pages 4-5: Since cost was an important factor in choosing among the three capping sub-alternatives, appropriate documentation should be included to support the significant differences in cost. Additional cost documentation is required for all alternatives.

114. Section 4.2.2, Page 5, Paragraph 1: The EE/CA states that "as an interim measure, it was determined that additional cost could not be justified." Supporting cost documentation regarding the costs associated with the different caps is required to be presented. The analysis regarding cap evaluation is not supported by the information presented in the EE/CA.

115. Section 4.2.4, Page 5, Paragraph 1: In its description of stormwater run-off treatment, the text states that "...suspended solids would be allowed to settle prior to treatment through the biodenitrification towers and effluent water system prior to discharge..." However, the text does not provide any engineering calculations relating to treatment efficiency. According to Table 5-1, a large percentage of the uranium contamination is not filterable (i.e., is present in its soluble ionic form). Thus, there is no justification as to the mechanism used in the existing biodenitrification surge lagoon for removal of heavy metal contamination through settling. Further, there is no discussion of precisely which mechanism is proposed for removing soluble uranium from this stream. In general, the technology screening used for selection of such a treatment train is not mentioned in this section.

116. Section 4.2.4, Page 5, Paragraph 1: In its description of storm water run-off treatment, the EE/CA states that "suspended solids would be allowed to settle prior to treatment through the biodenitrification towers and effluent water system prior to discharge ..." However the EE/CA does not provide any engineering calculations

relating to treatment efficiency. According to Table 5-1, a large percentage of the uranium contamination is not filterable because it is present in its soluble ionic form. Thus, there is no justification for use of the settling in the existing biodenitrification surge lagoon for the removal of heavy metal contamination. The EE/CA does not specify which mechanism is proposed for removing soluble uranium from this stream. In general, the technology screening used for selecting such a treatment train is not presented.

117. Figure 4-3, Page 7: See comments for Figure 4-1. Legend should include subsurface drains.

118. Figure 4-4, Page 8: This figure is too cluttered. Many of the lines are not defined in the legend, the drainage flow arrows are difficult to follow, and the drainage boundaries are not clear. The figure is far too small to adequately illustrate the remedial alternative. This alternative should be illustrated using standard scales, and put on a large fold-out page, if necessary.

119. Section 4.2.4, Page 10, Paragraph 1: The EE/CA does not provide data showing that surface water run-off originating in Area A in uncontaminated.

120. Section 4.2.4, Page 10, Paragraph 1: Run-off from Area A must be monitored for contamination prior to discharge to Paddys Run.

121. Section 4.2.4, Page 10, Paragraph 2: The integrity of the liner in the clearwell needs to be evaluated prior to continued use. It may be a continuing source of contamination.

122. Section 4.2.4, Page 10, Paragraph 3: The text states that "...the required isolation of Area C is accomplished by existing topography." As previously discussed, the figures in the report do not include adequate topographic information to confirm such conclusions.

123. Section 4.2.4, Page 11, Paragraph 4: Although no additional contamination will be discharged into Area G, residual contamination already present in Area G may contaminate Paddy's Run. This possibility, and appropriate controls, should be evaluated.

124. Section 4.2.4, Page 11, Paragraph 4: Data from Tables 2-1 and 2-4 (Sampling Locations DD-07, RO-13 and RO-17) indicate significant contamination in Area G. Will the

run-off from this area be discharged into Paddy's Run and, if so, will it be monitored prior to discharge?

125. Section 4.2.4, Page 11, Paragraph 5: As stated earlier, no data presented in the EE/CA supported the conclusion that run-off originating in Drainage Area A is acceptable for direct discharge to Paddy's Run.

126. Section 4.3, Page 12, Paragraph 3: The text should specify how the disposal volumes were determined, to what depth contaminated soils will be removed from the waste pits, and the level of "clean" that will be used to determine whether soil should be removed.

127. Section 4.3, Page 15: Regardless of the preferred alternative, monitoring of Paddy's Run should be included to indicate the reduction in uranium loading to the stream following the implementation of the removal action.

128. Section 4.3, Page 15, Paragraph 2: ALARA concerns should be further explained.

129. Section 4.3, Page 15, Paragraph 3: The phrase "...alternatives that would satisfy the objectives to an acceptable extent..." is not defined here or elsewhere in the report.

130. Section 5.1.1, Page 1, Paragraph 1: Protectiveness of public health and the environment should be defined.

131. Section 5.1.1, Page 2, Paragraph 1: Calculations should be referenced here to quantify the difference in magnitude between uranium risks and risks posed by other waste materials at the site. This is the only way that the conclusion in the text can be fully justified.

132. Section 5.1.1, Page 2, Paragraph 5: It is unclear why a 50-year CEDE limit of 25 mrem is justified for direct ingestion of contaminated water and sediments as opposed to 4-mrem limit for the ground water pathway. All pathways are based on direct ingestion. Furthermore, given that there are five operable units, a target value of 25 mrem/unit would exceed the 100-mrem limit set for all pathways.

133. Section 5.1.1, Page 3, Paragraph 1: The calculations used to derive the 50-year CEDE should be provided.

134. Section 5.1.1, Page 3, Paragraph 3: The source or

equation for converting mrem to pCi/L or g/L should be referenced in the text.

135. Section 5.1.1, Page 3, Paragraph 4: The Hazard Index is based on the estimated daily intake from all relevant pathways. This should be indicated in the text.

136. Section 5.1.1, Page 3, Paragraph 4: A health-based concentration for a child of 15 kg would be more appropriate to represent a higher risk population

137. Section 5.1.1, Page 4, Paragraph 2: An indication of the types of remedial actions under consideration would enhance the evaluation of each alternative.

138. Section 5.1.1, Page 4, Paragraph 2: CERCLA requires that removal actions should contribute to the efficient performance of long-term remedial actions to the extent practicable. Consistency with the final action is only one of the factors to be considered in the "Implementability" factor. U.S. EPA EE/CA guidance should be consulted.

139. Section 5.1.3, Page 5, Paragraph 4: The text uses a 5 year project duration to calculate total costs, stating that "even though the associated activities or structures may continue to function beyond this period, it has been assumed that they will be incorporated into the final remedial action after five years..." Although this may be the case, the EE/CA should include a sensitivity analysis to take into account a the possibility of a significantly later implementation of the final remedial action.

140. Section 5.2.1, Page 6, Paragraphs 3-4: All calculations and assumptions should be included either in the text or in an appendix. This includes the calculations for CEDEs and HIs. Assumptions should be referenced. Also, CEDE should be added to the list of abbreviations.

141. Section 5.2.1, Page 6, Paragraph 4: The EE/CA should report a concentration rather than an activity level and indicate the specific isotopes that contribute to this value. No sediments sampling values have been reported to validate this statement and the location of this reported sample has not been shown to justify its suitability as a representative sample.

142. Section 5.2.1, Page 7, Paragraph 1: The groundwater exposure pathway scenario described in this section

would benefit greatly by a figure showing mass rates and the model cell used in dilution concentrations.

143. Section 5.2.1, Page 7, Paragraph 2: Indicate the additional pathways that were evaluated to support the reported dose of 21 mrem.

144. Section 5.2.2, Page 8, Paragraph 1: Because uranium was detected in fish, the risk analysis should address the bioaccumulation potential of uranium, and compare the risk with the other risks posed by the site.

145. Section 5.2.2, Page 9, Paragraph 1: The EE/CA does not present data that supports the conclusion that fugitive dust emissions do not pose a potential risk to receptors.

146. Section 5.3.1, Page 9, Paragraph 5: The data table in Section 2.3 shows only two samples (WMCO #16 and R03) with total uranium below 10 g/L. The result for R03 (7 g/L) is suspect because subsequent WMCO samples collected in the same location had total uranium concentrations of 1,560 g/L and 3,400 g/L. Therefore, background or residual concentrations were not established in Section 2.3.

147. Section 5.3.1, Page 10, Paragraph 1: The "acceptable level of risk" needs to be defined.

148. Section 5.3.1, Page 10, Paragraph 3: The residual contamination has not been fully characterized in the drainage area east of the area to be capped. In addition, all areas not capped will continue to contaminate surface water run-off to above background levels. Although the report states this is within the acceptable risk, it should also be noted the areas of residual contamination will act as a continuing sources of contamination to Paddy's Run. Also, the level of acceptable risk should be defined.

149. Section 5.3.2, Page 10, Paragraph 1: The text states that "...By reducing the amount of contaminants entering storm water run-off, the implementation of the capping alternative would satisfy the principal environmental objective of reducing the mass loading of uranium to Paddy's Run." However, no engineering estimate or calculation presented as to the level of treatment provided by the proposed alternative. The report should state the effectiveness of this alternative in terms of percent removal of uranium or gross radioactivity. An alternative that costs several

million dollars that only removes a small percentage of the toxicity hazard should not be considered effective.

150. Section 5.3.2, Page 10: While capping will not significantly decrease the volume of storm water from the waste storage area to Paddys Run, it will decrease the amount of contaminated run-off. This option needs to be further evaluated in the EE/CA.

151. Section 5.3.3, Page 11: The objective of the removal is to reduce the impact of contaminated run-off on Paddys Run by reducing the volume of contaminated run-off that enters Paddys Run. Capping would be an effective alternative to achieve this objective. The need to treatment would not become a less significant or irrelevant factor.

152. Section 5.3.4, Page 11: This section should state that the volume of the cap material represents less than 1 percent of the total material to be excavated. The volume is an insignificant amount and adds little difficulty to implementing any of the future remedial alternatives considered.

153. Section 5.3.4, Page 11: The text states that the capping alternative is inconsistent with most of the alternatives under consideration for the final action. This point should be elaborated upon. No definite final action is known yet.

154. Section 5.3.9, Page 13: This section should include data on various stabilizing agents, and how they have been used on similar wastes. Without such data, it is not possible to properly evaluate the cost or effectiveness of stabilizing the contents of Pits 5 and 6.

155. Section 5.3.6, Page 12: It is not clear why the contents of Waste Pits 5 and 6 should be stabilized. Neither of these two waste pits currently contaminate surface water run-off. Therefore, the stabilization of these pits is not consistent with the removal action objectives.

156. Section 5.3.7, Page12, Paragraph 1: It is not clear what the permit-to-install is for. The actual permit should not be needed if the action is on-site.

157. Section 5.3.8, Page 12, Paragraph 1: The phrase "...aforementioned need for a change in course..." is unclear.

158. Section 5.3.9, Page 13, Paragraph 1: The "...materials necessary to stabilize waste materials..." should be specified in the text.

159. Section 5.3.9, Page 13, Paragraph 2: According to EPA EE/CA Guidance (p. 2-36) alternatives that include O&M after one year must be evaluated using two present worth analyses. Detailed present worth computations should be included in an appendix that is referenced in the text.

160. Section 5.3.9, Page 13, Paragraph 2: An annual O&M cost of $278,000 appears high for activities that "...include only the cost of cap maintenance...". Please justify the use of 5% of the direct capital costs as an estimate of O&M costs. In addition, for alternatives 2 and 4, there is no mention of monitoring Paddy's Run to indicate the effectiveness of the proposed removal. Monitoring costs should be included in O&M costs.

161. Section 5.4.2, Page 16: A 10 percent increase in mass loading of uranium to the Great Miami River is unacceptable. Current discharge rates already exceed the total annual permitted limits by 15 percent (see South Plume EE/CA).

162. Section 5.4.2 Page 16: Specify the current and projected mass loadings to the Great Miami River.

163. Section 5.4.2, Page 15, Paragraph 1: It is unclear why "...no environmental improvement..." would be seen upstream from the collection sump (because waste pits, etc. are not controlled). The purpose of Alternative 4 is to collect or divert and collect all contaminated storm water run-off.

164. Section 5.4.2, Page 16: The design and estimated operational contaminant (all applicable HSLs) removal efficiency for the AWWT facility and the projected mass loading to the Great Miami River should be presented. A chart showing current contaminant treatment should also be presented.

165. Section 5.4.6, Page 17, Paragraph 2: The EE/CA should discuss the types of "...modifications to existing ditches..." and "...good construction planning..." that will be implemented to minimize discharge during the changeover.

166. Section 5.4.8, Page 18, Paragraph 3: The collection and treatment alternative will only be "fully effective"

when a new waste water treatment facility is completed (as stated in Section 5.4.5).

167. Section 5.4.9, Page 18, Paragraph 1: Full implementation of the collection and treatment alternative requires the presence and operation of the advanced waste water treatment plant. The associated costs and time factors involved with this crucial phase of the alternative have not been addressed in the time and cost evaluation of this alternative.

168. Section 5.5.1, Page 19, Paragraph 3: The EE/CA states that "...where radionuclides are concerned, the process of coordinating DOE regulations with mainstream state and federal environmental regulations is required." Yet, nowhere in this report is this actually attempted. Rather, the analysis relies solely on TBCs derived from DOE 5400.5. Thus, compliance with only a very small fraction of the ARARs are actually evaluated in the report. Additionally, health-based criteria and exposure assessments are TCBs and are to be used to set cleanup levels. This needs to be clarified in the text.

169. Section 5.5.1, Page 19: Uranium is not excluded from regulation under Federal drinking water standards. While no Federal Maximum Contaminant Level (MCL) exists or has not been proposed for uranium, the Maximum Contaminant Level Goal (MCLG) is targeted at zero, which is consistent with U.S. EPA's policy regarding carcinogens. The tentative MCLG for uranium is zero. In addition, a recent U.S. EPA health advisory listed the tentative 10-4 cancer risk level at 160 pCi/l. Thus, the tentative MCLG is a TBC for cleanup standards analysis.

170. Section 5.5 and Tables: This section requires more detail. CERCLA requires that remedial and removal action meet applicable or relevant and appropriate requirements (ARARs) of other environmental laws. The selected alternative must attempt to meet or exceed all ARARs. For example, the present MCL for gross alpha and gross beta in several surface water samples exceeds limits. Therefore, the surface water discharge is not in compliance with ARARS. Radon requirements of 40 CFR 61, Subpart Q is a chemical ARAR. An action ARAR is the requirements to secure approval to construct prior to commencing a project that results in increase air emissions (radionuclides and non-radionuclies). 24

171. Table 5-2, Page 20: The EPA Interim Drinking Water Standards should be considered ARARs, especially when

concentrations in several surface water samples exceed the limits for gross alpha and gross beta.

172. Table 5-2, Page 21: Include the State of Ohio location standards for treatment, disposal, and storage facilities in the floodplain.

173. Table 5-2: This information should be presented in the format presented in U.S. EPA ARAR guidance.

174. Table 5-2: RCRA-regulated waste must be included in the list for action-specific ARARs or TBCs. See U.S. EPA's policy on "Environmental Review Requirements for Removal Actions".

175. Section 6-2, Page 1, Paragraph 4: It is unclear what "residual loadings" will exist if the capping alternative is implemented. It is also unclear how the environment upstream of Paddy's Run will be more protected by the capping alternative.

176. Section 6-2, Page 4: CERCLA requires that the toxicity, mobility, and volume be reduced to the maximum extent practicable. The statute gives preference to the treatment of the waste or the source material. Under this mandate, it would make more sense to prevent the water from becoming contaminated as part of this removal action.

177. Section 6-2, Page 5, Paragraph 1: The fact that cost of the alternative was previously approved for funding is not a justification or factor in selection of the best remedy to address the environmental and public health threat of the contaminated storm run-off.

178. Section 6-3: Based on the information presented in the EE/CA and other information available to U.S. EPA, the selected alternative is not justified.

179. Section 6.3, Page 5: The EE/CA sattes that the collection and treatment option is consistent with all final remedies being considered for both the waste pits (operable unit #1) and all other environmental media (operable unit #5). This should be demonstrated in the EE/CA.

180. Section 6.3, Page 5, Paragraph 1: The final statement of the text states that the preferred alternative (collection and "treatment") "...can be implemented for half the cost of the capping alternative, while providing equal or greater protection for public health and the environment." However, Section 5.4.3,

Reduction in Toxicity/Mobility/ Volume, states that ". . . rather than actually being treated, the uranium is essentially being rerouted to the Great Miami River without first passing through Paddy's Run." In contrast, the capping alternative is expected to greatly reduce the contact between the runoff and the radioactive waste materials, thus resulting in a significant decrease in mobility. Thus the report compares two options with widely varying effectiveness, and erroneously selects an alternative based on cost factors only.

181. Appendix A: The results of the HELP model depends upon some factor that are not consistent with the design assumption. For example, the text states that the simulations assume current topography. For Areas 1 through 5, a uniform slope of less than one percent is used. This is not consistent with the design slope of 5 percent. In addition, the design of the cap in Area 3 is three to six percent.

182. Appendix A: Cost estimate sources should be referenced. Each table should include a brief description of the alternative in its heading for purposes of clarity. It is unclear why cost estimates are required for Alternatives 3 and 5.

183. Appendix B, Alternative 2: Cost estimates should be more comprehensive to include items such as site preparation, etc. Mobilization/Demobilization costs of $5,000 are probably low, considering the decontamination required for all exposed equipment. A solidification cost of $4.00 ft-3 needs to be referenced. A design (engineering) cost of 20 percent, amounting to nearly a million dollars, appears high for a simple capping alternative. Annual O&M costs, mentioned in the text, should also be added to the table.

I. Pit 5 = 52,000 sq ft versus
II. Pit 5 = 47,500 sq ft
II. Pit 5: 5 x 47,500 = 237,500 not 236,250
III. Liner cost = 1,600,900 not 1,600,800
IV. Change "demolition" to demobilization.

184. Appendix B, Alternative 3: Mobilization/Demobilization costs are not listed. Disposal Costs of $324 ft-3 need to be referenced. Annual O & M costs also need to be added to this table.

185. Appendix B, Alternative 4: The cost estimate lacks sufficient detail for review. An estimate summary of

$699,391, and its six significant figures, is not appropriate for an EE/CA-level cost estimate. In addition, a basis is required for each of the line items in this cost estimate.

186. Appendix B, Alternative 5: A basis is needed for the $1,485 yd-3 disposal cost at NTS. A $50 million design cost also appears excessive for a remedial action consisting only of excavation and off-site disposal.

Both alternatives 2 and 4 can be shown to prevent further contamination of Paddys Run, thus reducing the risk to human health and the environment. However, alternative 4 (alone) is unsatisfactory because it does not reduce the potential for leaching of uranium and other hazardous substances from the waste pits to the underlying aquifer. Because of this continuing migration, only alternative 2 meets 11 the objectives of the action. A hybrid of alternatives 2 and 4 (combined) should be considered.

These comments are required to be addressed in a revised draft EE/CA that is to be submitted to U.S. EPA within thirty (30) days of the date of this letter.

Please contact me at (312 or FTS) 886-4436 if there are any questions.

Sincerely,

Catherine A. McCord

Catherine A. McCord
Remedial Project Manager

cc: Maury Walsh, OEPA
Graham Mitchell, OEPA-SWDO
Bruce Boswell, Westinghouse