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U-004-305 .46

**DISAPPROVAL OF THE OU #2 REMEDIAL INVESTIGATION REPORT
(FEBRUARY 18, 1994 SUBMITTAL)**

04/22/94

USEPA DOE-FN
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COMMENTS



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION 5
 77 WEST JACKSON BOULEVARD
 CHICAGO, IL 60604-3590

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REPLY TO THE ATTENTION OF:

APR 22 1994

Mr. Jack R. Craig
 United States Department of Energy
 Feed Materials Production Center
 P.O. Box 398705
 Cincinnati, Ohio 45239-8705

HRE-8J

RE: Disapproval of the OU #2
 Remedial Investigation Report

Dear Mr. Craig:

The United States Environmental Protection Agency (U.S. EPA) has completed its review of the Operable Unit (OU) 2 Remedial Investigation (RI) Report. Although the RI has adequate data to define the nature and extent of contamination in OU 2, U.S. EPA disagrees with several of the United States Department of Energy's (U.S. DOE) conclusions regarding interpretation of the data.

For example, U.S. DOE states that there is no significant impact of the Lime Sludge Ponds on the underlying soils. However, the radionuclides in the Lime Sludge Ponds pose a significant risk. Also, U.S. DOE failed to discuss the impacts of the Lime Sludge Ponds on soils and the perched groundwater.

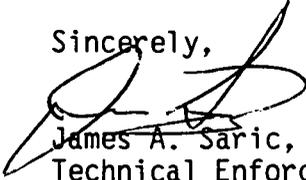
The basic approach of the baseline risk assessment appears to be technically valid and appropriately conservative. However, numerous errors and omissions in text, calculations, and references were found that prevented a complete and thorough review of the document. In addition, the summary and conclusions of the risk assessment provides little useful information for risk management decisions.

Therefore, U.S. EPA hereby disapproves the RI report pending incorporation of the attached comments into the document. U.S. DOE must incorporate these comments into the RI report and/or submit highlighted change pages within thirty (30) days receipt of this letter.

(WARNER(R)
 PARTIAL
 ACTION RESPONSE
 TO R-0901
 (7838) 000001

Please contact me at (312) 886-0992 if you have any questions.

Sincerely,



James A. Saric, Remedial Project Manager
Technical Enforcement Section #1
RCRA Enforcement Branch

Enclosures

cc: Tom Schneider, OEPA-SWDO
Pat Whitfield, U.S. DOE-HDQ
Don Ofte, FERMCO
Jim Thiesing, FERMCO
Paul Clay, FERMCO

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bcc w/o attachments:

William Muno->Norm Niedergang->Kevin Pierard, WMD
Brian Barwick, ORC
Cheryl Allen, OPA

bcc w/attachments:

Gene Jablonowski, ARD
Jean Michaels, PRC

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COMMENTS ON THE DRAFT "REMEDIAL INVESTIGATION REPORT FOR
OPERABLE UNIT 2 - FEBRUARY 1994"

U.S. EPA REGION 5 RADIATION SECTION

MARCH 1994

Commenting Organization: U.S. EPA, Radiation Section

Section #: Glossary Page #: G-1 Line #: 11 Code: E

Original Comment #: 1

Comment: It would be useful if the definitions for 2000 and 3000 series wells were included.

Response:

Action:

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.1.2 Page #: 4-4 Line #: 17 Code: C

Original Comment #: 2

Comment: Please clarify in text whether the method used to calculate the 95th percentile of RI/FS field investigation data sets, for purposes such as providing activity levels for air transport assessment (Tables 5-50 through 5-54), is the same as the method to calculate the 95th percentile background concentrations presented here.

Response:

Action:

Commenting Organization: U.S. EPA, Radiation Section

Section #: 4.2.2 Page #: 4-22 Table #: 4-3 Code: C

Original Comment #: 3

Comment: In the tables that present field investigation data such as this one, it would be useful to include columns indicating for each parameter's data set:

- 1) the statistical distribution type (normal, lognormal, or undetermined);
- 2) the mean concentration;
- 3) the standard deviation; and
- 4) the 95th percentile concentration.

There seems to be more than enough room for this inclusion, as it would make referencing the data for fate and transport and risk assessment purposes more convenient.

Response:

Action:

Commenting Organization: U.S. EPA, Radiation Section
Section #: 4.2.5 Page #: 4-98 Line #: 24 Code: C
Original Comment #: 4

Comment: In this section, as also in sections 4.3.5 and 4.5.5, please state the likelihood of remediation and whether the ecological impacts from these waste areas will be addressed in the Site-Wide Ecological Risk Assessment.

Response:
Action:

Commenting Organization: U.S. EPA, Radiation Section
Section #: 5.0 Page #: 5-1 Line #: 33 Code: C
Original Comment #: 5

Comment: Please clarify that technetium-99 and neptunium-237 are not the progeny of the uranium and thorium series isotopes, and that neptunium-237 is in fact a transuranic radionuclide.

Response:
Action:

Commenting Organization: U.S. EPA, Radiation Section
Section #: 5.5 Page #: 5-184 Line #: 4 Code: C
Original Comment #: 6

Comment: Please review the accuracy of the stated EPA guideline reference on this line and throughout the rest of this document. Also, most of the references noted in sections 5.5.3.1, 5.5.3.2, 5.5.4, and 5.5.4.1 are not listed in the references section at the end of this volume.

Response:
Action:

Commenting Organization: U.S. EPA, Radiation Section
Section #: 5.5.4 Page #: 5-192 Line #: 26 Code: C
Original Comment #: 7

Comment: Please explain here what a "worst case annual meteorological period" is.

Response:
Action:

Commenting Organization: U.S. EPA, Radiation Section
Section #: A.3.5.3 Page #: A-3-23 Line #: 11 Code: C
Original Comment #: 8

Comment: It is not clear how the limited erosion potential of the surface soil of the North Lime Sludge Pond and the Active Flyash Pile was determined and how it was quantified for emission rate determination.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.4 Page #: 4-72 Line #: 16 to 19
Original Specific Comment #: 5
Comment: The text states that one organic compound was detected for the Phase II sampling of 2000-Series wells. Table 4-15, page 4-92, contains two organic compounds. This inconsistency should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.6 Page #: 4-99 Line #: 14 and 15
Original Specific Comment #: 6
Comment: The text states that the sediment samples and surface water samples collected downstream of the Solid Waste Landfill indicate a possible impact from the Solid Waste Landfill. The conclusion in the text should be expanded to indicate the chemical constituents comprising the impact.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.6 Page #: 4-99 Line #: 24 and 25
Original Specific Comment #: 7
Comment: The text states that deeper pits may have been used for disposal in the southwest corner of the Solid Waste Landfill. Data to substantiate this conclusion should be provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.6 Page #: 4-99 Line #: 27 and 28
Original Specific Comment #: 8
Comment: The text states that concentrations of radionuclides and organic compounds were detected above background in leachate from two of the three test trenches. The text should state the comparison background media for the leachate. The text should specify which two trenches had elevated radionuclide and organic concentrations.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.6 Page #: 4-99 Line #: 30 and 31
Original Specific Comment #: 9
Comment: Lines 9 and 10 on page 4-72 state that strontium-90 was also detected at elevated levels in the perched groundwater downgradient from the waste unit. The conclusion in the text concerning perched groundwater does not state that strontium-90 was also detected at elevated levels. This inconsistency should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.6 Page #: 4-99 Line #: 30 through 35
Original Specific Comment #: 10
Comment: This section provides a summary of conclusions regarding the Solid Waste Landfill investigation. Groundwater results are only discussed in terms of thorium and uranium contamination. A thorough discussion of

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 4.4.3 Page #: 4-218 Line #: 13 to 15
 Original Specific Comment #: 26
 Comment: The text concludes that recharge to the regional aquifer is supplied by surface water from the west drainage and that the recharge water has elevated concentrations of uranium. This conclusion should be included in the summary in Section 4.4.6.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 4.4.3 Page #: 4-229 Line #: 3 to 5
 Original Specific Comment #: 27
 Comment: The text concludes that the Inactive Flyash Pile may be the source of semivolatile compounds detected in the Paddy's Run sediment. This conclusion should be included in the summary in Section 4.4.6.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 4.4.6 Page #: 4-255 Line #: NA
 Original Specific Comment #: 28
 Comment: This summary section does not discuss metals or organic compound contamination in surface water, sediment, perched and regional groundwater. The summary section should be expanded to discuss these issues.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 4.4.6 Page #: 4-255 Line #: 28
 Original Specific Comment #: 29
 Comment: The text refers to Hydropunch™ sample 11010. However, this sample number is not included in Table 4-42 on Page 4-238. This inconsistency should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 4.4.6 Page #: 4-255 Line #: 31
 Original Specific Comment #: 30
 Comment: The text states that the seepage in the drainage to the west may be associated with perched groundwater. Additional discussion should be provided.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 4.5.1 Page #: 4-256 Line #: 8
 Original Specific Comment #: 31
 Comment: The text presents the volume for the combined subunits of the Inactive Flyash Pile and South Field. It may be useful to also present the approximate volume for each subunit separately for remedial design purposes.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 4.5.4 Page #: 4-309 Line #: 14 through 18
 Original Specific Comment #: 32
 Comment: The discussion provided in the text regarding metals contamination in 1000-series wells is incomplete with regard

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.2 Page #: 4-332 Line #: 19
Original Specific Comment #: 38
Comment: The text states that in subsurface flyash, 11 organics were detected above background concentrations for subsurface soil during Phase I sampling. However, Table 4-61A contains 18 organics detected above background concentrations. This inconsistency should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.2 Page #: 4-332 Line #: 32
Original Specific Comment #: 39
Comment: The text states that one organic compound was detected above background concentration in subsurface soil during Phase I sampling. However, Table 4-62 contains four organics detected above background concentrations for soil. This inconsistency should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.2 Page #: 4-357 Line #: NA
Original Specific Comment #: 40
Comment: Table 4-64 presents the Active Flyash Pile toxicity characteristic leaching procedure (TCLP) results. The term "rejected" is used to describe data in the table. The term "rejected" should be explained in the table and text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.2 Page #: 4-360 Line #: 1
Original Specific Comment #: 41
Comment: The text states that three organic compounds were detected above background concentrations for soil in subsurface soil during Phase II sampling. However, Table 4-63 contains six organics detected above background concentrations for soil. This inconsistency should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.2 Page #: 4-360 Line #: 4
Original Specific Comment #: 42
Comment: The text presents a comparison between "surface samples" and "subsurface samples". It is unclear if soil or flyash samples are being compared. The text should clarify this issue.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.2 Page #: 4-360 Line #: 37
Original Specific Comment #: 43
Comment: The text presents an analysis of the data recorded in Table 4-64. This analysis does not correlate with the data presented in the table with respect to parameters detected. These inconsistencies should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 7.4 Page #: 7-8 Line #: 3
 Original Specific Comment #: 49
 Comment: The text states that the groundwater models have been calibrated to site conditions; however, Appendix A.2 states that the groundwater model was calibrated to 1986 and regional groundwater water levels. The groundwater model presented in the OU2 RI/FS should be calibrated to RI/FS measured water levels.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 7.4 Page #: 7-9 Line #: 30
 Original Specific Comment #: 50
 Comment: This line states that an excess carcinogenic risk from hazardous waste sites of 10^{-4} is acceptable. However, the text does not reference a source for this value. The text does not state that action may also be required for excess carcinogenic risks between 10^{-4} and 10^{-6} . The text should be revised to provide a reference for any allowable risk levels presented and clearly indicate at what risk level(s) action may be required.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 7.4.1 Page #: 7-13 Line #: 8
 Original Specific Comment #: 51
 Comment: The text states that the chemicals of concern (COC) for the Solid Waste Landfill consist of six radionuclides, three metals, and three organic compounds. However, Table 7-2 on Page 7-14 contains seven radionuclides. This inconsistency should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 7.4.1 Page #: 7-13 Line #: 15
 Original Specific Comment #: 52
 Comment: The text states that no impact has been observed in the GMA; however, according to Table 7-2, contaminants have been detected in 2000-Series wells screened in the GMA. The text should be revised to resolve this discrepancy.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 7.0 Page #: 7-13 Line #: 27
 Original Specific Comment #: 53
 Comment: Table B.4-7a on page B-4-19 identifies thorium-228 as a significant contributor to risk to trespassing youths through exposure to sediment. However, the text does not include thorium-228 as a significant contributor to risk for this type of receptor. This discrepancy should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Tables 7-2 Page #: 7-14 Line #: N/A
Original Specific Comment #: 54
Comment: Dibenzo (a,h)-anthracene is listed in Table 7-3 on
Page 7-15. However, it is not listed in Table 7-2. This
inconsistency should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.4.1 Page #: 7-14 Line #: NA
Original Specific Comment #: 55
Comment: Table 7-2 lists COCs detected in the Solid Waste
Landfill. Uranium-234, uranium-235/236, uranium-total,
carbazole, and indeno(1,2,3-cd)pyrene are shown as COCs for
the surface water pathway; however, in Appendix A.1, these
COCs are not listed. In addition, Appendix A.2 lists
technetium-99 (Tc-99) as a COC for the groundwater pathway;
however, it is not listed as a COC in Table 7-2. These
inconsistencies should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.4.2 Page #: 7-18 Line #: 5
Original Specific Comment #: 56
Comment: The text indicates the COCs for the Lime Sludge Ponds
consist of four radionuclides, two metals, and one organic
compound. However, Table 7-5 on Page 7-19 contains two
organic compounds. This inconsistency should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.4.3 Page #: 7-23 Line #: NA
Original Specific Comment #: 57
Comment: Table 7-8 lists COCs detected in the Inactive Flyash
Pile. Thorium-228, uranium-235/236, arsenic, beryllium, and
uranium-total are shown as COCs for the surface water
pathway for the Inactive Flyash Pile. These constituents
are not listed as COCs in Appendix A.1 for the Inactive
Flyash Pile. These inconsistencies should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.4.4 Page #: 7-29 Line #: NA
Original Specific Comment #: 58
Comment: Table 7-11 lists COCs detected in the South Field.
Radium-226, radium-228, thorium-228, uranium-235/236,
arsenic, beryllium, uranium-total, benzo(a)pyrene,
benzo(b)fluoranthene, benzo(k)fluoranthene, ideno(1,2,3--
cd)pyrene, and Aroclor-1254 are shown as COCs for the
surface water pathway for the South Field. These
constituents are not listed as COCs in Appendix A.1 for the
South Field. These inconsistencies should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.4.5 Page #: 7-34 Line #: NA
Original Specific Comment #: 59
Comment: Table 7-14 lists COCs detected in the Active Flyash Pile. Lead, uranium-235/236, and uranium-total are listed in Appendix A.1 as COCs for the surface water pathway. These COCs are not listed as COCs in Table 7-14. These inconsistencies should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.4.6 Page #: 7-37 Line #: 17 to 19
Original Specific Comment #: 60
Comment: The text states that the Active Flyash Pile was a major source of metal constituents in Paddys Run and the Great Miami River. According to Table A.1-7, which lists Paddys Run water contaminant concentrations resulting from contamination from the various subunits, the South Field was also a major source of metal contaminants to Paddys Run. This inconsistencies should be resolved.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.6.1 Page #: 7-46 Line #: 1 to 3
Original Specific Comment #: 61
Comment: The text states that OU2 subunits do not present a risk to current on-property or off-property receptors above allowable levels; however, according to Figure A.2-65, Tc-99 has been detected off-site at concentrations greater than 0.1 picocuries per liter (pCi/L), apparently posing a risk to off-site receptors. The figure should be reviewed to determine if risk to off-site receptors exists from Tc-99.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.3 Page #: A-1-4 Line #: 3 to 8
Original Specific Comment #: 62
Comment: The text states that the Modified Universal Soil Loss Equation (MUSLE) model uses event-specific runoff volume and flow rate parameters to calculate the soil loss for a single rainfall event. The lost soil becomes contaminated sediment in nearby surface water bodies and acts as a source of groundwater contamination in the GMA. Because the baseline risk assessment discusses contamination for the next 1,000 years, the cumulative amount of contaminated sediments would serve as a contaminant source, especially since Paddys Run and the Storm Sewer Outfall Ditch are intermittent and Paddys Run has a low flow rate. U.S. DOE should revise the text to state if it attempted to calculate cumulative amounts of contaminated sediments and not just event-specific amounts.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.2.5 Page #: A-2-39 Line #: 28, 29, and 30
 Original Specific Comment #: 73
 Comment: The text discusses longitudinal dispersion coefficients, interstitial seepage, velocity, and molecular diffusion coefficients; however, the text does not provide these values.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.2.7.1.1 Page #: A-2-52 Line #: 20 and 21
 Original Specific Comment #: 74
 Comment: The text discusses modifications to Darcy's Law to model flow for unsaturated conditions; however, these modifications are not discussed. The text should discuss the modifications to Darcy's Law, the values used in the modification, and how the values were determined.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.2.8 Page #: NA Line #: NA
 Original Specific Comment #: 75
 Comment: Graphs depicting contaminant loading to the GMA from various subunits (for example Figure A.2-15) show a sharp rise and then an exponential decrease in contaminant loading concentration with time. The loading decrease is based on the rate of depletion of the source. The document should be revised to explain how the depletion rates were calculated. Also, if the graphs need modification, then the figures showing contaminant concentrations at various time intervals will also need corrections based on the recalculated depletion rates.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.2.8.1 Page #: A-2-125 Line #: 8 to 12
 Original Specific Comment #: 76
 Comment: The text discusses hydraulic conductivity values for various layers in the groundwater model; however, the source of these values (such as slug tests or a literature search) is not provided.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.2.8.1 Page #: A-2-125 Line #: 25
 Original Specific Comment #: 77
 Comment: The text states that a recharge value of 2 inches per year (in/yr) was assigned to the developed and sewered areas of the site; however, the rationale of using 2 in/yr for the recharge value is not provided for each area.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.2.8.1 Page #: A-2-125 Line #: 28 to 33
 Original Specific Comment #: 78
 Comment: The text discusses the calibration of the groundwater flow model and that the arithmetic mean residual for the

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.3.5.3 Page #: A-3-20 and 21 Line #: 24-33; 1-11
Original Specific Comment #: 96

Comment: The discussion regarding the threshold friction velocity presented in these two paragraphs does not lead to any conclusions or inferences. The statement that OU2 has limited erosion potential was established earlier in Paragraph 3 on page A-3-20. Therefore, the text should include a discussion supporting the threshold friction velocity calculated in Attachment A-3-II.

ENCLOSURE 2

**TECHNICAL REVIEW COMMENTS ON THE DRAFT
REMEDIAL INVESTIGATION (RI) REPORT FOR OPERABLE UNIT 2 (OU2)
SECTION 6.0 AND APPENDIX B – BASELINE RISK ASSESSMENT**

(29 Pages)

exposure scenarios. Justification for calculating CT risks for only a portion of the exposure scenarios should be provided.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.3.0, Tables B.3.3-1 and B.3.4-1
 Page #: B-3-71, 72, 73, 101, 102, and 103
 Original General Comment #: 16
 Comment: Under future land uses, the tables state that exposure routes that require development time were included. It is unclear what development time is being referred to. An explanation for this statement should be provided in Section B.3.0.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.3.0, Tables B.3.3-1 and B.3.4-1
 Page #: B-3-71, 72, 73, 101, 102, and 103
 Original General Comment #: 17
 Comment: The future homebuilders receptor portion of the tables includes the following statement: "per Operable Unit 1." This seems to imply that this receptor was also included in the operable unit 1 risk assessment. The importance and relevance of this statement is unclear. An explanation for why this statement is included, as well as a reference, should be added to Section B.3.0.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.4.0 Page #: NA Line #: NA
 Original General Comment #: 18
 Comment: The summary presented in this section is quite abbreviated and seems to provide little information to assist in risk management decision making. The text and tables should be revised and expanded to clearly indicate (1) any subunit, receptor, pathway, and CPC associated with significant risk, (2) the subunits, receptors, pathways, and CPCs associated with the highest risks, and (3) the key sources of uncertainty in the risk assessment along with the potential effect on the estimated risk.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B-I Page #: NA Line #: NA
 Original General Comment #: 19
 Comment: DOE did not provide the sources for several parameter values used in this attachment. For example, DOE did not provide the source for the Ra²²⁶ concentration in soil that is used to estimate indoor radon concentrations. Also, the source establishing the values for the intrinsic permeability of the soil (k) was not referenced. The text should be revised to reference the source of these parameters.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.2.2.1 Page #: B-2-9 Line #: 25
Original Specific Comment #: 13
Comment: The first sentence in this section states that "Under current land use assumptions, the FEMP is assumed to remain as it currently exists." However, the Baseline Risk Assessment (RA) evaluates current land use scenarios with and without access controls. The first sentence should be revised to address access control assumptions.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.2.1 Page #: B-2-10 Line #: NA
Original Specific Comment #: 14
Comment: Table B.2-1 includes a column labeled "Previous OU2 Risk Assessment." It is not clear which previous assessment is being referred to.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.2.2 Page #: B-2-13 Line #: NA
Original Specific Comment #: 15
Comment: Table B.2-2 describes the direct contact medium each receptor is assumed to be exposed to under a variety of scenarios. The direct contact medium for the Future Homebuilder is described as "waste material/subsurface soil." However, the exposure point concentration for this receptor is described as "subsurface soil within subunit." For other receptors the direct contact medium is described as "soil" and the exposure point concentration is described as "surface soil within subunit." Table B.2-2 in particular and the OU2 RA in general should be revised to clarify whether particular exposures are assumed to be to soil (surface or subsurface) only or are assumed to be to some combination of waste material and soil.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.3.1.1 Page #: B-2-22 Line #: 30
Original Specific Comment #: 16
Comment: This line states that data from the Characterization Investigation Study and Environmental Survey investigations were not used in the risk assessment. However, because a risk assessment should include as much valid data as possible, the report should also indicate why the data from these investigations was not used in the risk assessment. Additional valid data would further support the risk assessment and better characterize the site.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.3.6 Page #: B-2-30 Line #: NA
Original Specific Comment #: 17
Comment: This section presents and refers to statistical methods applied to data used in the report. However, several of the methods are neither clearly presented nor referenced.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.2.4.2.3 Page #: B-2-65 Line #: 16
 Original Specific Comment #: 34
 Comment: Equation B.2-18 includes in part the product
 "(C_{asi})(Q_g)." This product should be revised to read
 "(C_{agi})(Q_g)."

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.2.4.2.3 Page #: B-2-67 Line #: 22 and 24
 Original Specific Comment #: 35
 Comment: Equations B.2-21 and B.2-22 are incorrect as written.
 In terms of calculating intake from ingestion of beef
 Equation B.2-21 needs to be revised to include
 multiplication by the parameter "CF." In terms of
 calculating intake from both ingestion of beef and milk,
 Equation B.2-21 needs to also be revised to include
 multiplication by the parameter "FI"; this parameter also
 needs to be defined. Similarly, Equation B.2-22 needs to be
 revised to include multiplication in the denominator by the
 parameter "FI."

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.2.4.2.4 Page #: B-2-68 Line #: 32 and 33
 Original Specific Comment #: 36
 Comment: These two lines present two equations to be used to
 calculate the value for the parameter "DA." The choice as
 to which equation to use depends on a comparison of the
 values for the parameters "ET" and "t*." Values for the
 parameter "ET" are presented in Tables B.2-3 and B.2-4.
 However, values for the parameter "t*" are not presented in
 Appendix B. Appendix B should be revised to include
 chemical-specific values for the parameter "t*."

The equations presented only apply to organic constituents.
 However, Table B.2-6B includes calculated values for the
 parameter "DA" for inorganic constituents. Section
 B.2.4.2.4 should be revised to include the equation(s) used
 to calculate values for the parameter "DA" for inorganic
 constituents.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.2.4.2.4 Page #: B-2-72 Line #: Table B.2-6A
 Original Specific Comment #: 37
 Comment: Footnotes "b", "c", and "e" include citations for the
 following references: "Webster et al. (1991)", "EPA 1993d",
 and "EPA 1992h", respectively. However, none of these
 references are included in the reference section.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.4.2.6 Page #: B-2-75 Line #: 1
Original Specific Comment #: 38
Comment: The definition of the parameter "I_{ER}" does not include units.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.4.3 Page #: B-2-77 Line #: 28 and 29
Original Specific Comment #: 39
Comment: These line indicate that blood-lead levels in children were calculated using the "UBK model." This approach is in contrast to the approach taken for other OUs, where an argument was made not to use the "UBK model." This section in particular and the OU2 RI/FS in general should be revised to also evaluate exposure to and risks associated with lead in a manner similar to other OUs. In addition, this section should be revised to present the rationale for using the UBK model in the OU2 RI/FS when DOE previously argued against its use.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.5.1.1 Page #: B-2-81 and 82 Line #: NA
Original Specific Comment #: 40
Comment: This table includes numerous lines with a chemical name followed by blanks. U.S. DOE should complete this useful summary table.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.7.1 Page #: B-2-103 Line #: 11 through 16
Original Specific Comment #: 41
Comment: This paragraph states that sampling procedures used to determine background concentrations may have high detection limits, which may have resulted in the erroneous inclusion of a chemical for further evaluation. The inclusion of additional chemicals would be a conservative approach. Uncertainties resulting in the erroneous exclusion of chemicals are of greater concern. Therefore, this discussion should include a statement about chemicals that may have been erroneously detected in background and are excluded from further evaluation.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.7.2 Page #: B-2-104 Line #: 17 and 18
Original Specific Comment #: 42
Comment: The total mass of uranium-238 was estimated from average concentrations. As a conservative approach, uranium-238 concentrations within the upper confidence limit, not average concentrations, should be used to estimate the total mass.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.7.2 Page #: B-2-104 Line #: 20 through 24
Original Specific Comment #: 43
Comment: The fate and transport modeling used a "70-year rule."
A reference for the "70-year rule" should be provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.7.2 Page #: B-2-1-5 Line #: 6 and 7
Original Specific Comment #: 44
Comment: This sentence states that "values chosen are intended
to be conservative." However, the values referred to and
the criteria for choosing these values is unclear.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.7.5 Page #: B-2-106 Line #: 2
Original Specific Comment #: 45
Comment: This sentence states that the 90th or 95th percentile
was used for "most" of the exposure parameters in this risk
assessment. A statement including the exposure parameters
for which the 90th or 95th percentile was not used and an
explanation for why these percentiles were not used should
be provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.7.5 Page #: B-2-106 Line #: 17 through 20
Original Specific Comment #: 46
Comment: The exposure parameters associated with the greatest
uncertainty include those regarding exposure time and
exposure via dermal contact. The rationale for the high
contribution to uncertainty by these parameters should be
discussed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.7.5 Page #: B-2-106 Line #: 31 and 32
Original Specific Comment #: 47
Comment: The range of risk from the CT to the RME scenarios
incorporates the range of uncertainty regarding intake
assumptions. The intake assumptions and the associated
uncertainties should be described.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.2.7.7 Page #: B-2-110 Line #: 3 through 5
Original Specific Comment #: 48
Comment: Using toxicity equivalency factors (TEF) assumes that
all dioxin and furan congeners are carcinogenic. However,
the text does not specify the type of bias that is
introduced to the risk assessment by this assumption. The
text should be revised to clearly state that this assumption
would introduce a high (conservative) bias to the risk
assessment.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.1.1 Page #: B-3-1 Line #: 22 to 33
Original Specific Comment #: 49

Comment: This paragraph explains that for the purposes of assessing risk due to contaminants present at the Active Flyash Pile, it was assumed that a receptor lived and farmed on the South Field. However, as defined elsewhere in Appendix B, a home could be constructed either on the South Field or the Solid Waste Landfill. This section needs to be revised to explain why it is assumed that the receptor lives and farms on the South Field rather than on the Solid Waste Landfill. Risks should be evaluated for the residence and farming location associated with the greatest risks.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.1.3.1 Page #: B-3-5 Line #: 18
Original Specific Comment #: 50

Comment: This line includes the phrase "Active Flyash Pile battery...." It is unclear whether the term "battery" in some way refers to a boundary of the subunit. Therefore, the term should be defined or removed from the sentence.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.1.3.1 Page #: B-3-5 Line #: 25
Original Specific Comment #: 51

Comment: This line includes the phrase "CPCs in soil...." Because surface soil and subsurface soil are considered separately at some points in the risk assessment, this phrase should be revised to read "CPCs in surface soil...."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.1.3.1 Page #: B-3-5 Line #: 26 to 28
Original Specific Comment #: 52

Comment: These lines summarize the risks associated with the contaminants that contribute most significantly to the total risk for the trespassing youth. The summary omitted the contributions of arsenic ($2.7E-06$) and beryllium ($4.8E-05$).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.1.2 Page #: B-3-6 Line #: Table B.3.1-3
Original Specific Comment #: 53

Comment: Table B.3.1-3 was compared to Tables B.3.1-2(a), (b), (c), (d), and (e). Numerous inconsistencies were identified. For example, in Table B.3.1-2(a) Th-Total and U-Total are identified as CPCs; however, these contaminants are not included in Table B.3.1-3. Table B.3.1-3 should be closely compared to Tables B.3.1-2(a) through (e) and all inconsistencies removed. Furthermore, Table B.3.1-3 should be revised to include a footnote explaining whether the CPCs for groundwater represent contaminants found in Series 1000, Series 2000, or both types of wells.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.3.1.3.2 Page #: B-3-7 Line #: 27
 Original Specific Comment #: 54

Comment: This line includes the phrase "risks were due to...."
 However, the chemicals referred to do not present to total
 risk. Therefore, this statement should be revised to read
 "risks were due primarily to...."

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.3.1.4.1 Page #: B-3-9 Line #: 16 and 17
 Original Specific Comment #: 55

Comment: These lines present the total risks associated with
 ingestion of homegrown produce. To provide additional
 useful information, the lines should be revised to indicate
 that the these risks are due primarily to the presence of
 arsenic in the homegrown produce.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.3.1.4.3 Page #: B-3-10 Line #: 29 to 31
 Original Specific Comment #: 56

Comment: These lines state in part that hazards for the on-
 property RME farmer are presented in Table B.3.1-18(a).
 However, this table only includes carcinogenic risks. Table
 B.3.1-18(a) should be revised to include noncarcinogenic
 risks for the on-property RME farmer.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.3.1.7 Page #: B-3-12 Line #: 19 to 22
 Original Specific Comment #: 57

Comment: These lines state that the risks for various receptors
 are in the range of 1.0×10^{-6} to 1.0×10^{-5} . However,
 risks associated with the trespassing youth ($6.8E-05$) and
 the groundskeeper ($9.2E-05$) exceed this range. These lines
 should be revised to indicate that the risks discussed are
 in the range of 1.0×10^{-6} to 1.0×10^{-4} .

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B.3.1.7 Page #: B-3-32 Line #: 18 to 22
 Original Specific Comment #: 58

Comment: These lines discuss the total HIs for the on-property
 RME farmer and on-property child. Specifically, the total
 HI for the farmer is stated to be 2.1, made up of risks from
 arsenic, beryllium, toluene, and zinc that contribute 49
 percent of the total hazard. This statement should be
 revised to indicate that arsenic and toluene in surface
 material contribute 42 percent and total uranium in
 groundwater contributes 42 percent of the total hazard.
 Similarly, the total HI for the child is stated to be 8.0
 made up of risks from arsenic in surface material which
 contributes 60 percent of the total hazard. This statement
 should be revised to indicate that arsenic and toluene in
 surface material contribute about 58 percent and total

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.5.6 Page #: B-3-142 Line #: 28
Original Specific Comment #: 81

Comment: This line states that the total hazard index (HI) for the on-property child is due to the presence of uranium-total in soil. However, it is the combined risk of uranium-total ($9.1E-01$) and arsenic ($3.1E-01$) that result in the total HI greater than 1. Therefore, the report should be revised to discuss the risk from both uranium-total and arsenic.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.3.0, Tables B.3.3-29 and B.3.4-34
Page #: NA Line #: NA
Original Specific Comment #: 82

Comment: Various portions of several rows in these tables are blank. For example, a trespassing youth exposed to cesium-137 in sediment in the inactive flyash pile is blank. The associated risks, percentages, or other appropriate symbols should be added to all blank rows in these tables.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.4.0 Page #: B-4-1 Line #: 6
Original Specific Comment #: 83

Comment: This line states that the report shows that radionuclides are the contaminants contributing most significantly to risks. However, this can lead to confusion in the use of the word significantly. Radionuclides may contribute the highest risks, but polynuclear aromatic hydrocarbons, arsenic, and beryllium also present significant risks. Therefore, the report should be revised to clearly indicate which CPCs contribute the highest risks and all CPCs with a carcinogenic risk greater than 1×10^6 or a HI greater than 1.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.4.1 Page #: B-4-3 Line #: NA
Original Specific Comment #: 84

Comment: Table B.4-1 shows no risk to the groundskeeper from neptunium-237 in soil. However, Table B.3.1-11 shows that this risk is $1.8E-06$. The tables should be revised to eliminate this inconsistency.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B.4.1 Page #: B-4-4 Line #: NA
Original Specific Comment #: 85

Comment: The following issues were identified regarding Table B.4-2: (1) the table does not present risks to the off property residential child, Greater Miami River user youth, or user of groundwater-affected beef and milk, as presented in Tables B.3.1-12(b), B.3.1-26(b), and B.3.1-21(b), respectively; (2) no table presenting the risk from expanded

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: B-II Page #: B-II-39 Line #: NA
Original Specific Comment #: 99
Comment: This section notes that neither a reference dose nor a reference concentration are deemed appropriate for lead. However, EPA uses a biokinetic uptake model in lieu of the usual toxicity standards. FEMP should add a brief discussion of the model here and use the model in its risk assessment.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B-III Page #: B-III-6 Line #: Table B.3.1-2(c)
Original Specific Comment #: 100
Comment: Footnote "d" to this table refers to "(Drinking Water Regulations and Health Advisories; EPA 1993)." The reference section does not include such a reference.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B-III Page #: B-III-8 Line #: Table B.3.1-2(d)
Original Specific Comment #: 101
Comment: For parameters whose distribution is undetermined, the concentration term should be the maximum concentration. Several errors were found in this table. For example, the concentration terms for acetone and bis(2-ethylhexyl)-phthalate were presented as 6.00 and 4.00, respectively. The maximum hits for these two parameters were 10 and 6, respectively. This table should be closely reviewed and the concentration terms corrected as necessary.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B-III Page #: B-III-11 Line #: Table B.3.1-4
Original Specific Comment #: 102
Comment: Intake calculations were checked for this table and several apparent errors were identified. The intake via ingestion of soil for NP-237, PU-238, and arsenic are presented as $8.5E+01$ and $1.1E+01$ pCi/g and $1.3E-06$ mg/kg, respectively. On the other hand, the intakes were recalculated as $6.5E+01$ and $8.5E+00$ pCi/g and $9.6E-07$ mg/kg, respectively. The calculations in this table should be reviewed and any errors corrected.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B-III Page #: B-III-13 Line #: Table B.3.1-4
Original Specific Comment #: 103
Comment: The intakes via ingestion of soil for noncarcinogenic hazard evaluation for barium and nickel are presented as $2.1E-05$ and $3.3E-06$ mg/kg, respectively. These intakes were recalculated as $1.6E-05$ and $2.5E-06$ mg/kg, respectively. The calculations in this table should be reviewed and any errors corrected.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B-III Page #: B-III-14 Line #: Table B.3.1-4
 Original Specific Comment #: 104

Comment: The intake via dermal contact with soil for nickel is presented as $5.6E-06$ mg/kg. This intake was apparently calculated using a value for the parameter "ABS" of $1E-02$. However, the correct value for this parameter for nickel is $5E-04$ (see Table B.2-6A). The intake was recalculated as $2.8E-07$ mg/kg. The calculations in this table should be reviewed and any errors corrected.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B-III Page #: B-III-15 Line #: Table B.3.1-5
 Original Specific Comment #: 105

Comment: The intake via ingestion of surface water for NP-237, U-235/236, and arsenic are presented as $7.8E-01$ and $3.0E-01$ pCi/g and $1.4E-08$ mg/kg, respectively. These intakes were recalculated as $5.8E+00$ and $2.2E-01$ pCi/g and $1.1E-07$ mg/kg, respectively. The calculations in this table should be reviewed and errors corrected.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B-III Page #: B-III-22 and B-III-24
 Line #: Table B.3.1-8(a) and B.3.1-8(b)
 Original Specific Comment #: 106

Comment: Under the sections for ingestion of milk the columns labeled as "Risk" should be revised to read "Hazard."

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B-III Page #: B-III-36 Line #: Table B.3.1-11
 Original Specific Comment #: 107

Comment: The intake of toluene via dermal contact with soil is presented as $5.7E-09$ mg/kg. This value was apparently calculated using a value for the parameter "ABS" of $1E-02$. The correct value is $3E-02$ (see Table B.2-6A). The intake was recalculated as $1.7E-08$ mg/kg. The calculations in this table should be reviewed and any errors corrected.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: B-III Page #: B-III-65 Line #: Table B.3.1-16
 Original Specific Comment #: 108

Comment: The intake for NP-237 via ingestion of soil is presented as $2.0E-01$ pCi. The intake was, recalculated as $1.8E+02$ pCi. A comparison of the intakes via inhalation of soil and the intakes via ingestion of soil indicates that the values are very nearly identical. It appears that the inhalation intakes were mistakenly also used as the ingestion intake values. The calculations in this table should be reviewed and any errors corrected. The same situation appears to have occurred in this same table on page B-III-67.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B-III Page #: B-III-71 Line #: Table B.3.1-17(a)
Original Specific Comment #: 109
Comment: This table presents intakes and risks associated with exposure to sediments for the future expanded trespasser. However, on page B-3-9 of Appendix B, the text states that risks associated with exposure to sediments were not evaluated for this receptor. This discrepancy should be eliminated.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B-III Page #: B-III-128 Line #: Table B.3.2-2(b)
Original Specific Comment #: 110
Comment: The CPC cell for phenanthrene is blank. This cell should be filled in with a "Y" or "N" and highlighted as appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B-III Page #: B-III-516 Line #: NA
Original Specific Comment #: 111
Comment: Table 3.5-2(c) refers to footnote "k". However, no such footnote is presented at the end of the table. Therefore, the table should be revised to eliminate this inconsistency.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: B-III Page #: B-III-724 Line #: NA
Original Specific Comment #: 112
Comment: Table B.4-19(a) does not follow the format of other similar tables presented in the report because it does not present the exposure point concentrations for each compound in the table. The table should be revised to be consistent with similar tables presented in the report.