

4011

**DISAPPROVAL OF THE OU #2 REMEDIAL
INVESTIGATION REPORT**

12/16/92

**USEPA/DOE-FN
105
LETTER**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD

CHICAGO, IL 60604-3590

LOG 9-01258
AR

DEC 13 2 53 PM '92

REPLY TO THE ATTENTION OF:

[REDACTED]

U-004-305.22

4011

DEC 16 1992

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. The RI Report has numerous deficiencies that must be addressed to not only revise the RI Report, but to address data gaps that exist in the investigation of OU #2 that are crucial to the ultimate selection of a remedy.

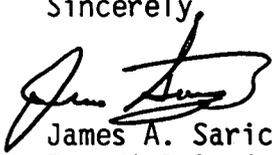
The data collected in the OU #2 Report is not adequate to characterize the sources of contamination, or determine if the sources are contributing to contamination of various media. The investigation of the sources not only was done with minimal sampling effort, but the samples did not fully characterize the presence or nature and extent, of inorganic, organic, or radionuclide contamination. Also the majority of data presented in the RI Report has not yet been validated. Data validation is necessary to assure the data is defensible in use in risk assessment analysis and remedy selection.

The OU #2 RI Report concludes that not enough information is available to determine if the various sources of contamination in OU #2 are contributing to groundwater contamination. The effects of various sources in groundwater are essential in remedy selection, in that no materials can be left in place without first determining their contribution to groundwater contamination. As a result data gaps exist throughout the OU #2 RI Report that must be addressed. These data gaps reflect uncertainty in modeling of contaminant transport and risk assessment calculation.

Therefore, U.S. EPA disapproves the OU #2 RI Report pending incorporation of the attached comments. Considering U.S. EPA's extensive comments, the fact that this Report is a primary document as defined in the 1991 Amended Consent Agreement, and the potential impacts of the comments on schedules, U.S. EPA requests a meeting between U.S. EPA and the United States Department of Energy to discuss the comments as soon as possible.

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

Sincerely,



James A. Saric
Remedial Project Manager

Enclosure

cc: Graham Mitchell, OEPA-SWDO
Pat Whitfield, U.S. DOE-HDQ
Nick Kauffman, FERMCO
Jim Theising, FERMCO
Paul Clay, FERMCO

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

4011

Review of the Draft Remedial Investigation Report, Operable Unit 2, Fernald Environmental Management Project (FEMP), Fernald, OH

I have reviewed the Draft RI Report for Operable Unit 2, concentrating on the Risk Assessment presented as Appendix A. At the review meeting for the Site-Wide Characterization Report, held October 5, 1992 in Chicago, we were made aware of the fact that new EPA guidance and comments received after the initiation of the OU 2 Report would not be incorporated in this Draft, but that they would be reflected in the Revised Draft. Most of the issues of concern were discussed at length at the Chicago meeting. Accordingly, I have noted below areas where the Draft Report is at variance with new guidance and with earlier comments. These comments should be addressed in the revised document to insure that there is consistency between Operable Unit Reports.

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section # 6.1.1 Pg. #: 6-3 Line #: 6 Code:C
Original Comment #

Comment: I do not recall that we had determined an acceptable frequency at which Chemicals of Concern could be eliminated from the risk assessment using the "frequency of detection" rule.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table 6-2 Pg. #: 6-8 Line #: Code:M
Original Comment #

Comment: Changes made in earlier comments are not reflected in this Table. The choice of parameter values will be discussed at length in the risk assessment (Appendix A).

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: 6.2.1 Pg. #: 6-13 Line #: 24 Code:M
Original Comment #

Comment: The use of the TEF approach, along with the benzo(a)pyrene approach, for PAHs is allowed by Region

V. This comment will be further addressed in the risk assessment (Appendix A).

Response:
Action:

4011

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.1.4 Pg. #: A-1-9 Line #: 3 Code:C
Original Comment #

Comment: Why was the geometric mean UCL chosen for small sample populations? Use of the arithmetic mean UCL would be a more conservative choice when the sample distribution is not known.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.1.1.2 Pg. #: A-2-3 Line #: 2 Code:M
Original Comment #

Comment: We have previously discussed whether the use of regional background data for soils is appropriate. As I recall, the radionuclide data is suspect. Background data should reflect the area of interest as closely as possible.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A-2.1 Pg. # A-2-4 Line #: Code:M
Original Comment #

Comment: The use of subsurface soil data as a substitute for surface soil data may lead to erroneous conclusions. Most metals and semi-volatile organic contaminants will remain bound in the surface soil. Risk calculations from exposure to these contaminants require the collection of surface soil data. Subsurface soil data is most appropriate for determining the likelihood of contaminant movement to groundwater.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.1.2.3 Pg. #: A-2-10 Line #: 25 Code:M
Original Comment #

Comment: We discussed the use of the UTL method at the Site-wide Characterization Report meeting. EPA feels that this method may bias the choice of Chemicals of Concern, and thus the method is not acceptable to EPA. See also the comments from Paul White, HQ statistician, submitted during the Workplan review. We agreed to review the use of this method for the Site-wide Characterization Report only.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.1.3.1 Pg. #: A-2-14 Line #: 9 Code:M
Original Comment #
Comment: Ditto the above comment. 4011
Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.2.2 Pg. #: A-2-20 Line #:16-24 Code:M
Original Comment #
Comment: The methods listed should not be used to "screen-out"
contaminants from the risk assessment. A qualitative
evaluation of the contaminants should be included and
the effect of elimination (underestimation of risk) of
this contaminants should be discussed in the
Uncertainties section.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.2.2 Pg. #: A-2-20 Line #: 27-36 Code:M
Original Comment #
Comment: How can pathways/chemicals be eliminated from the risk
assessment based on air modeling or modeling of runoff
to surface water and sediments when data is not
available on surface soil contaminants/concentrations
to permit accurate modeled predictions? Need to
collect some surface soil data to justify these steps.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.2.2 Pg. #: A-2-24 Line #: 1-2 Code:C
Original Comment #
Comment: What list is referred to here? Where is this list in
the document (cross-reference)?

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.2.3 Pg. #: A-2-24 Line #: 21-26 Code:C
Original Comment #
Comment: This paragraph is confusing. Background concentrations
are subtracted from radionuclide concentrations, but
not from chemical onsite concentrations. Both may be
carcinogens. Chemical carcinogens do not have a
threshold. Rewrite.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.2.3.1 Pg. #: A-2-25 Line #: 7-8 Code:M
Original Comment #
Comment: Subsurface soil concentrations are not likely to be an

adequate substitute for surface soil data.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.2.3.2 Pg. #: A-2-27 Line #: 2-3 Code:C
Original Comment #

Comment: Line 2: Are we talking about the ingestion of leachate here or leachate modeled to groundwater? Clarify.
Line 6: Given the 20% rule used here, the presence of five chemicals at this level who give a risk if they had the same target organ!

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.2.3.4 Pg. #: A-2-28 Line #: 2-5 Code:M
Original Comment #

Comment: The model assumes mass loading of surface soil to air, but we do not have surface soil data. Subsurface soil data is inadequate for this calculation. Can not use this logic to eliminate pathways (see p A-2-29, lines 1-3).

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A.2-5 Pg. #: A-2-31 - 34 Line #: Code:M
Original Comment #

Comment: Lots of problems with parameter values here. Some submitted in earlier comments and/or discussed at the Site-Wide Characterization Report meeting.

Soil:

IR for farmer should be 480 mg/d for RME and 50 mg/d for CT.

FI of 0.1 is too low given 4/16 hr/d in standard trespasser scenario.

EF for the trespasser scenario is usually considered to be 52 d/yr.

Veg Ingestion

How was the ingestion value of 0.305 kg/d derived?

Dermal contact

The SA values do not follow the Dermal Guidance or Supplemental Dermal guidance. Values should reflect 25% of the total body surface area for each population. Reference is incorrect.

EF value does not match the standard trespass scenario of 52 days/yr.

Cs is based on subsurface soil data. Need surface soil data.

Inhalation of Dust

Ca is modeled from subsurface soil data.

ET x EF value is probably too conservative for the trespass scenario and not conservative enough for an

on-site resident farmer.

External Radiation

ET and EF do not reflect the standard trespass scenario values.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A.2-6 Pg. #: A-2-35 - 37 Line #: Code:M
Original Comment #

Comment: Some errors noted in this table are listed below.

Water Ingestion

Note IR of 10 mg/d for Avg. Farmer

Beef Ingestion

IR differs between soil and water pathways. Need consistency.

Milk Ingestion

No "h" in this set of footnotes.

FI differs between soil and water pathways. Need consistency.

Dermal Contact

SA does not reflect guidance. See above comments.

Reference not correct.

EF does not reflect Region V standard trespass scenario.

See above.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.3.1 Pg. #: A-2-38 Line #: 30-32 Code:M
Original Comment #

Comment: Region V does allow the use of the TEF approach to be included for PAHs. See additional comments on this issue.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A.2-8 Pg. #: A-2-40 Line #: Code:M
Original Comment #

Comment: Table does not reflect the cancer slope factors for the date shown (8/92). For example, no oral SF is given for arsenic or antimony; oral SF for benzo(a)pyrene changed 6/92, inhalation SF for BAP withdrawn 6/92, etc.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A.2-10 Pg. #: A-2-46 Line #: Code:M
Original Comment #

Comment: There are no toxicity values for lead. Risk assessment methods available include the Lead Uptake Biokinetic Model and the EPA OSWER directives on lead.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.3.3.1 Pg. #: A-2-44 Line #: 30 Code:M
Original Comment #

Comment: The ATSDR Toxicological Profile for Uranium (ATSDR/TP-90/29) includes newer information on oral absorption. Data from Battacharrya et al, 1989, referenced on page 54, indicates that oral absorption for the fasting adult baboon is about 4.5% and that children are likely to have fasting absorption levels 3.6 times higher. Please correct text and any calculations that used a lower value.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A.2-11 Pg. #: A-2-66 Line #: Code:M
Original Comment #

Comment: I have no problem with the incorporation of risk calculations based on the TEF approach for BAP. The values in the Table should be rounded to one significant digit as the use of the values shown implies an accuracy that does not exist. The results of both methods can be discussed in the results sections and the uncertainties in both methods in the Uncertainties section.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.2.4.3 Pg. #: A-2-69 Line #: 26-31 Code:M
Original Comment #

Comment: As was discussed at the Chicago meeting, the develop of the Unit Risk Factors (URFs) and Unit Toxicity Factors (UTFs) are not fully described. This calculation method must be presented and reviewed before it is accepted.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.3.1 Pg. #: A-3-8 Line #: 5-8 Code:M
Original Comment #

Comment: I do not think that we agree with the interpretation of the histograms presented in this and other sections. You are considering elevated values (Some noted as often as 3/16 samples) as "outliers". I consider them "hot-spots", given the sparse sampling data. The risk calculations should consider risks based on hot-spot data for the future residential scenarios.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.3.1 Pg. #: A-3-8 Line #: 16-18 Code:C
Original Comment #

Comment: I assume that this discussion refers to carcinogenic PAHs, not "total" PAHs, but it is not clear. Clarify.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.4.3 Pg. #: A-4-7 Line #: 19-20 Code:C
Original Comment #

Comment: We do not believe that the future residential farmer scenario is "highly unlikely" given the recent policy of releasing government lands to the public. It seems reasonable that the site would support a resident farm family. The problem is how to proportion the risk for OU #2. This is a problem inherent in the OU methodology and should be discussed in the Uncertainties section. Need to stress that this OU risk may be lower than similar risks from other OUs, but may be significant when added to similar pathway risks from other OUs.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.4.3 Pg. #: A-4-7 Line #: 26 Code:C
Original Comment #

Comment: Actually the values used in the exposure calculations for the resident farmer are not very conservative. See above comment on exposure parameter values.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.4.3 Pg. #: A-4-10 Line #: 5-7 Code:M
Original Comment #

Comment: The use of other methods available for PAHs is discussed above.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.4.3 #: general Line #: Code:M
Original Comment #

Comment: I did not see a discussion of those omissions and methods that result in an underestimation of risks - e.g. there is no discussion of the elimination from the quantitative assessment of contaminants for which there are no toxicity values/absorption values/ etc. These chemicals should be discussed in the Results and Uncertainties sections in a qualitative manner, and an explanation of how they influence the risk assessment given. A discussion of TICs is also missing from this

OU assessment and from the Uncertainties section.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen

Section #: A.5.1 Pg. #: A-5-1 Line #: 13 Code:C

Original Comment #

Comment: The term "upper-bound" indicates worst case and it not really correct when referring to the RME calculations. It is better to simply refer to these risk calculations as RME calculations.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen

Section #: A.5.1.1 - .5 Pg. #: A-5-1 Line #: Code:M

Original Comment #

Comment: The results for all sources give HIs for lead. There are no toxicity values for lead. Risk evaluations should be based on the Lead Uptake Biokinetic Model or the EPA OSWER directives on lead.

Response:

Action:

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.5.3.1 Pg. #: 4-76 Line #: N/A Code: C
Original Comment # 14
Comment: Please explain why only one RI/FS surface media sample from the Inactive Flyash Pile was deemed adequate for surface media characterization. Also give some explanation as to why the uranium concentrations in CIS samples are drastically higher than uranium concentrations in ES and RI/FS samples.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.6.3 Pg. #: 4-97 Line #: 35 Code: C
Original Comment # 15
Comment: Please explain why only one RI/FS surface media sample was taken within the boundary of fill of the South Field.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.6.4 Pg. #: 4-128 Line #: 16 Code: C
Original Comment # 16
Comment: Please explain why there were no RI/FS surface water or sediment samples collected in the South Field.

Response:
Action:

Commenting Organization: USEPA Commentor: Gene Jablonowski
Section #: 5.1.2 Pg. #: 5-1 Line #: 27 Code: C
Original Comment # 17
Comment: Since surface water runoff is a viable transport pathway for all of the waste areas in Operable Unit 2, except for the Lime Sludge Ponds, it should then be explained why there were no surface water or sediment samples collected in the South Field, as stated in section 4.6.4, page 4-128.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 5.3.1 Pg. #: 5-8 Line #: 15 Code: C
Original Comment # 18
Comment: This section, Air Quality Modeling and Contaminant Transport, deserves to be as

Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: 5.3.2 Pg. #: 5-9 Line #: 22 Code: C
 Original Comment # 23

Comment: This section, Surface Water Modeling, deserves to be as descriptive and complete as Section 5.3.3, Groundwater Modeling and Transport Analysis being that the surface water pathway is a viable one for contaminant movement.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: 5.3.3.1 Pg. #: 5-13 Line #: 9 Code: C
 Original Comment # 24

Comment: It should be clearly stated how attenuation, the loss of contaminants from the plume, could be a factor that would affect radionuclides with relatively long half-lives (> 1000 years) or low mobility.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: 5.4.7 Pg. #: 5-61 Line #: 20 Code: C
 Original Comment # 25

Comment: This section should not only summarize the contaminant transport information for the individual waste areas, but also the cumulative contaminant transport effects, if they exist, of all the OU 2 waste areas combined.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: 6.1.2 Pg. #: 6-4 Line #: 21 Code: C
 Original Comment # 26

Comment: In Figure 6-2, Operable Unit 2 Receptor Locations, locations of the off-site resident maximum receptors via the air and groundwater pathways due to the cumulative effects of all the OU 2 waste areas should be indicated.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: 6.2.2 Pg. #: 6-14 Line #: 19 Code: C
 Original Comment # 27

Comment: Please explain how exposure point concentrations for contamination in surface soil can be determined from subsurface soil boring results. The one location for the RI/FS

surface soil sample has uranium concentrations higher than most of subsurface samples taken within the Solid Waste Landfill study area.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: A.1.2 Pg. #: A-1-8 Line #: 12 Code: C
 Original Comment # 28

Comment: The acronym, COC, stands for contaminants of concern, not chemicals of concern. Also, it seems appropriate to use the term "contaminants of concern," which encompasses radionuclides and chemicals, rather than "chemicals of concern" throughout the risk assessment so as not to confuse the reader.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: A.1.4 Pg. #: A-1-8 Line #: 29 Code: C
 Original Comment # 29

Comment: All deviations in preparing the baseline risk assessment from the Risk Assessment Work Plan Addendum should be explained for clarity.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: A.2.3.2 Pg. #: A-2-44 Line #: 17 Code: C
 Original Comment # 30

Comment: Please name both sources used to identify RfD values.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: A.3.1.1 Pg. #: A-3-1 Line #: 18 Code: C
 Original Comment # 31

Comment: Titling sections A.3.1.1, A.3.2.1, A.3.3.1, A.3.4.1, and A.3.5.1 "Chemicals of Concern" may be confusing to the reader since the text covers both chemicals and radionuclides. "Contaminants of Concern" seems more relevant.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: A.3.1.1.1 Pg. #: A-3-8 Line #: 7 Code: C
 Original Comment # 32

Comment: Such highly removed outliers also exist for B2 PAHs and OCDD; it may be prudent to

assume that these samples indicate localized areas of elevated contamination than just merely statistical outliers. The text should be revised to indicate this possibility.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: A.3.2.2.1 Pg. #: A-3-30 Line #: 17 Code: C
Original Comment # 33
Comment: Please state the approximate percentage by which the external radiation exposure pathway contributes to the total risk from U-238 via all pathways.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: A.4.2.1.2 Pg. #: A-4-4 Line #: 5 Code: C
Original Comment # 34
Comment: Please clarify how groundwater and subsurface soil samples were often collected from locations having the highest radiation measurements.

Response:
Action:

Commenting Organization: U.S. EPA, ORIA - Las Vegas Commentor: Barry Parks
Figure #: B.1-1 Pg. #: B-2 Line #: N/A Code: C
Original Comment # 35
Comment: The FEMP windrose in Figure B.1-1 uses a scale of wind speeds which is not consistent with the wind speeds reported on the following page in Table B.1-1. Figure B.1-1 uses wind speed class boundaries of 1.8, 3.3, 5.4, 8.5 and 11.0 meters per second, and Table B.1-1 uses average wind speed categories averaging 1, 3, 5, 7, 9, and 12 meters per second. It is not understood why two different systems of reporting the same data are used in this report.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Gene Jablonowski

Section #: B.1.3.1

Pg. #: B-4

Line #: 6

Code: M

Original Comment # 36

Comment: The equation to estimate the emission rate of entrained dust is stated as:

$$E = 1.7 \left(\frac{s}{15} \right) \left(\frac{d}{235} \right) \left(\frac{f}{15} \right)$$

where: E = emissions rate (pounds/day/acre)

s = percent silt content of aggregate material,

d = number of dry days per year, and

f = percentage of time wind speeds exceed 12 mph at 1 foot above the ground.

On the other hand, Equation 4-9 of Control of Open Fugitive Dust Sources (Cowherd, Muleski, and Kinsey, EPA 1988) states the equation to estimate emissions from wind erosion of active storage piles as:

$$E = 1.7 \left(\frac{s}{1.5} \right) \left(\frac{365-p}{235} \right) \left(\frac{f}{15} \right) (lb/day/acre)$$

where: E = total suspended particulate emission factor

s = silt content of aggregate, percent

p = number of days with ≥ 0.25 mm (0.01 in.) of precipitation per year

f = percentage of time that the unobstructed wind speed exceeds 5.4 m/s (12 mph) at the mean pile height.

The equation stated in the OU 2 RI reduces the emission rate by a factor of 10 due to the divisor of the variable "s." Also, §7.1.2 of Control of Open Fugitive Dust Sources (Cowherd, Muleski, and Kinsey, EPA 1988) states a method for estimating fugitive dust emissions from agricultural fields that takes vegetative cover into account. With this in mind, it seems prudent to use dust emission methodologies that are relative to the characteristics and surface media of the waste areas being modeled.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Gene Jablonowski

Section #: B.1.3.1

Pg. #: B-4

Line #: 13

Code: C

Original Comment # 37

Comment: Please clarify how a silt content of surface materials can be assumed to be invariably ~10% for all the waste areas, especially for the North Lime Sludge Pond, which is said to be usually covered with 2 to 3 feet of water, and the Active Flyash Pile, which is an uncovered flyash waste area. It should be stated how the silt content of the aggregate was determined for the surface media of the various waste areas.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: B.1.3.1 Pg. #: B-4 Line #: 16 Code: C
 Original Comment # 38
 Comment: Please state or specifically cite the wind power law, with variables and their values, used to adjust the observed speeds at a 10-meter height.

Response:

Action:

Commenting Organization: U.S. EPA, ORIA - Las Vegas Commentor: Barry Parks
 Section #: B.1.3.2 Pg. #: B-4 Line #: 26 Code: C
 Original Comment # 39
 Comment: Reference is made to the Industrial Source Concentration Long-Term (ISCLT) model for air dispersion. It is believed that the correct name is Industrial Source Complex Long-Term model.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
 Section #: B.1.3.2 Pg. #: B-4 Line #: 31 Code: C
 Original Comment # 40
 Comment: Please clarify that if 1989 is the only year for which complete on-site meteorological data is currently available, then what meteorological data was used for the annual radionuclide NESHAP, Subpart H compliance modeling for the FEMP site.

Response:

Action:

Commenting Organization: U.S. EPA, ORIA - Las Vegas Commentor: Barry Parks
 Table #: B.1-2 Pg. #: B-5 Line #: N/A Code: M
 Original Comment # 41
 Comment: During the review of the 1989 FEMP stability array (Table B.1-2), some unusual values were noticed that deserve attention. The array has a number of high wind speeds in both the unstable (A and B) and stable (E) stability categories. This is at variance with the definition of these categories; instability is defined as occurring with high positive insolation and low wind speed, and stability with high negative insolation and light winds. The neutrally stable categories, C and D, typically have higher wind speeds. Also reviewed were several stability arrays reported by NOAA for other locations near FEMP, and they did not have any occurrences of high wind speeds in unstable and stable categories. It is recommended that the calculations for generating the stability array be reviewed to verify that they are correct.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: B.1.4 Pg. #: B-8 Line #: 6 Code: C
Original Comment # 42

Comment: The results of fugitive dust modeling section should state the typical dust loading in ambient surface air and discuss the contribution from the OU 2 waste areas. Also, comparisons of the modeled radionuclide concentrations in ambient air to the results from ambient air monitoring at the FEMP perimeter should be made.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: B.1.4.2.1 Pg. #: B-8 Line #: 33 Code: C
Original Comment # 43

Comment: It should be stated why airborne concentrations for contaminants originating from the Solid Waste Landfill were calculated at receptor locations based on contaminant concentrations in subsurface soils, rather than surface soils, in the waste area.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Tables: B.2-1 → B.2-4 Pages: B-30 → B-37 Line #: N/A Code: C
Original Comment # 44

Comment: It would seem appropriate to express values relative to radionuclide contaminant loading in terms of activity (pCi) rather than mass (mg or g) or liquid concentration (ml).

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: NA

Pg. #: NA

Line #: NA

Code:

Original Comment # ADD4

Comment: Ground-water elevation data from each of the OU 2 study areas is adequate to identify the direction of ground-water flow in both the perched and Great Miami Aquifer as early as 1990, yet several study areas do not have sufficient wells located downgradient to detect the release of contaminants. Examples include no wells immediate downgradient of the inactive flyash pile in the Great Miami aquifer; no wells downgradient of the lime sludge ponds in the perched water table aquifer; no wells downgradient of the solid waste landfill in the Great Miami aquifer; and no wells downgradient in the south field area in the perched water table aquifer. DOE should address these data gaps.

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: NA

Pg. #: NA

Line #: NA

Code:

Original Comment # ADD

Comment: The concentration of uranium used for the fate and transport modelling source term for the inactive flyash pile and south field area is listed in Tables B.3.10 and B.3.11 as approximately 500 ug/L and 26 ug/L. This is far below the 4,000 ug/l concentration detected in a 1,000 series well in this area. DOE should reevaluate the source terms used and determine the impact on the fate and transport modelling and risk assessment calculations.

on the piles to reduce particulate emissions. Some organic compounds in the oils would show up as tentatively identified compounds (TIC) and not as the target analytes. While analyses of soil samples from beneath the piles indicate that VOC contamination is not pervasive, the flyash piles remain uncharacterized, and not using VOC data will result in a risk estimate that is biased low. DOE should address these issues in the RI report.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: General

Pg. #: NA

Line #: NA

Code:

Original General Comment #8

Comment:

Some of the organic analyses used by DOE (specifically the volatile and semivolatile analyses referenced to a U.S. Environmental Protection Agency (U.S. EPA) statement of work in Table 2-1) provide data on nontarget chemicals called TICs. It is essential that the site characterization discuss TICs. Also, the accompanying data tables in Appendix A should give total TICs (concentrations and number and types of compounds) for every sample. If there are significant concentrations of TICs, more discussion is needed. DOE should determine the significance of TICs in assessing site risks by determining their effect on the fate and transport of other compounds. DOE should include all available data, including TIC data, in its RI report.

Response:

Action:

GENERAL COMMENTS -- RISK ASSESSMENT

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: NA Pg. #: NA Line #: NA Code:

Original General Comment #9

Comment: In the discussion of the statistical analysis of data, the treatment of outliers is unclear. The text should clarify whether outliers were eliminated from both on site and background data sets prior to the statistical background comparison. Outliers in background data would result in unreasonably wide tolerance limits. The report should be revised to clearly discuss the treatment of outliers in on-site and background data. Also, in the discussion of selection of chemicals of potential concern (CPC), criteria are presented for eliminating chemicals from consideration. However, it may be appropriate to include chemicals known to be related to previous site activities even though they "fail" a statistical test. This section should discuss this issue and include CPCs as appropriate. In addition, throughout the document, the terms "chemicals of potential concern" and "chemicals of concern" are used. The term "chemicals of potential concern (CPC)" should be used throughout the report, and other similar phrases should be replaced.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: NA Pg. #: NA Line #: NA Code:

Original General Comment #10

Comment: In some cases, the discussion of the results of risk characterization states that certain chemicals or radionuclides present "the majority" of the risk. In other cases, the report presents the specific percentage of total risk or the actual risk posed by certain chemicals. The report should quantify risks consistently in terms of the specific percentage of total risk contributed by certain chemicals and should avoid terms such as "the majority" that require interpretation. Also, the summary of risk characterization results includes chemical-specific risks, but it does not include summaries of risks from exposure to multiple chemicals. The report should present and discuss the totals of all chemical-specific risks within each pathway and across all pathways. The report should also include subtotals for organic compounds, radionuclides, and inorganic compounds. In addition, many chemicals are reported as having hazard indices (HI) greater than 1. However, considering the uncertainty involved with estimating the HIs, it would assist the reader if the actual HIs were presented rather than just stating that the HIs are greater than 1. The report should include the actual HI values for all HIs exceeding 1.

Response:

Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: NA Pg. #: NA Line #: NA Code:

Original General Comment #11

Comment: The discussion of risk characterization presents risks calculated using unit risk or unit toxicity factors. Use of these factors reduces the effort necessary to estimate total pathway risks for a chemical or radionuclide. However, the report should include tables indicating the fraction of total pathway risk contributed by each route, which could be determined during the derivation of the unit risk or toxicity

factors. Also, in Superfund risk assessment reports, carcinogenic risks are usually presented with only one significant digit. Carcinogenic risks in the report should be presented with one significant digit.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original General Comment #12

Comment: The future land use scenario considers a future on-site farming adult. However, in some instances such as ingestion of contaminated soil, noncarcinogenic risks for children may be higher than for adults because a child's lower body weight may result in a greater dose per unit of body weight. The report should evaluate child exposure in these instances, or it should discuss the omission of such an evaluation. Also, the evaluation of risk via ground-water exposure ignores exposure via inhalation of volatile CPCs and dermal contact with CPCs during bathing. These may be significant routes of exposure and should be evaluated in the report. The total risk from ground water, including the sum of the risks for the inhalation, dermal contact, and ingestion routes, should be presented and discussed. In addition, the following potential routes of exposure to surface or subsurface soils are not addressed in the evaluation of trespasser exposure: (1) inhalation of resuspended particulates, and (2) ingestion of fruits from plants grown in on-site soil. The report should justify the omission of these pathways or evaluate the risk from them.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original General Comment #13

Comment: In the discussion of the risk characterization, many results are presented following a lengthy introduction detailing the uncertainty of the results. This presentation is confusing, and it reduces the perceived usefulness of the report. The report should be revised to discuss most of the uncertainties in the uncertainties section, or the report should discuss the uncertainties after each brief data summary. Also, the report does not discuss uncertainties contributed by data gaps identified in the RI report. If the nature and extent of contamination have not been fully characterized, the potential exists for severe underestimation of the risks associated with any contamination. As noted in previous comments, DOE will have to define the nature and extent of contamination to adequately assess OU 2 risks. DOE also should discuss the uncertainties associated with current data gaps.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original General Comment #14

Comment: In the discussion of uncertainties, reasonable maximum exposure (RME) risks are referred to as "actually exceeding high end risks" and "greater than the highest value of the range of actual expected risk." While RME risks can and should be presented with associated uncertainty and discussed as highly unlikely, they cannot

and should not be presented as impossible. The language in the report should be revised to eliminate this implication.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original General Comment #15
Comment: Throughout the report, the term "central tendency" is used interchangeably with other terms such as "typical average." This may confuse the reader and misrepresent the function of the evaluation of central tendency exposure. The term "central tendency" should be used consistently throughout the document.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original General Comment #16
Comment: Surface soil samples for several sources either were not taken or were not analyzed for all parameters. The report assumes that subsurface soil data may be reasonably substituted for surface soil data in these instances. However, chemical and radionuclide concentrations may differ significantly between surface and subsurface soils, especially in the case of radionuclides, which may be present as the result of wind-borne deposition. Therefore, the report should discuss the specific rationale for choosing not to sample surface soils or not to analyze samples for all parameters. Also, the effect of the data substitution should be discussed in the uncertainties section.

Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original General Comment #17
Comment: At several points in the discussion of the risk characterization results, only the chemical contributing the highest risk is discussed. The discussion usually points out uncertainties in estimating the risk from that chemical. This approach may ignore other chemicals with significant risk via the same pathway and route. All chemicals posing significant risk should be discussed.

Response:
Action:

GENERAL COMMENTS -- FATE AND TRANSPORT MODELING

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix B Pg. #: NA Line #: NA Code:
 Original General Comment #18

Comment: Fate and transport modeling presented in Appendix B describes the results of contaminant transport from individual source areas in OU 2. However, it does not describe the cumulative impact of all sources at any given on- or off-site location. The modeling should be modified to present the cumulative impact of all source areas for on- and off-site locations. The report should also present maximum on- and off-site concentrations of contaminants resulting from all source areas in OU 2 and the locations of their occurrences.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix B Pg. #: NA Line #: NA Code:
 Original General Comment # 19

Comment: Modeling results presented in Appendix B are qualified with a statement indicating that simulated resuspension rates are significantly higher than those that actually occur because the resuspension model does not account for surface vegetation, which significantly retards resuspension. DOE should calibrate its dispersion model with actual field data to simulate more realistic resuspension rates than those presented in Appendix B.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix B Pg. #: NA Line #: NA Code:
 Original General Comment #20

Comment: Many references cited in the text are not provided in full in the list of references. For example, full references are not included for "Cowherd et al. (1984)" and "Bohn et al. (1978)" cited on Page B-4; "DOE 1990b" cited on Page B-47; and "Barari et al. 1987," "Biggar and Nielson (1976)," and "Mills et al. (1985)" cited on Page B-58. DOE should provide the complete reference for each work cited in the document.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor:
 Saric
 Section #: Appendix B Pg. #: NA Line #: NA Code:
 Original Comment #

Comment: The mathematical equations used in model simulations, as presented in the document, seem to have many inaccuracies (see Specific Comments No. 207 through 214). If the equations presented in the document are exactly the same as those used in the model, the modeling results presented in the document may be questionable. DOE should (1) check all equations presented in the document and (2) correct them as well as the modeling results, if necessary.

Response:
 Action:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.0

Pg. #: NA Line #: NA

Code:

Original Specific Comment #6

Comment: Section 2 of the RI report presents a detailed description of the OU 2 RI methods. The approved work plan sections or addenda under which each activity was performed should be clearly cited. Also, any deviations from these approved plans should be clearly and specifically called out along with the reasons for such deviations and whether these changes resulted in data gaps.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.1.1.2, Table 2-1

Pg. #: 2-4 Line #: NA

Code:

Original Specific Comment #7

Comment: This table lists six different analytical methods used during the RI/FS. The report should clearly state whether the U.S. EPA Region 5 Quality Assurance Section (QAS) has approved the use of these six methods for the RI/FS.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.1.1.4, Table 2-1

Pg. #: 2-4 Line #: NA

Code:

Original Specific Comment #8

Comment: Some corrections are needed in this listing of analytical methods used in the studies of OU 2. First, some analyses of metals and inorganics are ascribed to organic statements of work (SOW). Second, all analyses for dioxins/furans and organophosphorus pesticides are ascribed to SOWs that apply to organochlorine pesticides and polychlorinated biphenyls (PCB) but not the listed analytes. Third, certain analyses, including those for asbestos (see Page 2-3), Resource Conservation and Recovery Act (RCRA) characteristics (see Page 2-7), and water quality parameters (see Page 2-20) are omitted from this table. DOE should make the necessary corrections and additions.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.1.2.2

Pg. #: 2-7 Line #: 14-16

Code:

Original Specific Comment #9

Comment: The text indicates that interval soil samples were composited at the off-site laboratory to create composite borehole samples for VOC analyses. Soil samples intended for VOC analyses should not be composited because a high degree of volatilization is likely. This method has likely biased the results low. VOC data and any other data from samples composited in this manner is therefore questionable. The issue of VOC data usability should be thoroughly discussed in the report because for many subsurface investigations, such as that for the Flyash Pile, the single composite sample provides the only VOC data available.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.1.2.3

Pg. #: 2-7 Line #: 36

Code:

Original Specific Comment #10

Comment: The text discusses scanning blocks, but it is not clear whether this means that readings were made at the nodes as in Section 2.1.2.1 or that the entire surface area of a block was scanned and the readings were in some way averaged to give a single result. DOE should clarify the methods used. If these methods involved area scanning and averaging, the method used should be described.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 2.1.3.1
Original Specific Comment #11

Commentor: Saric
Pg. #: 2-10 **Line #:** 12-22 **Code:**

Comment: The text presents the primary objectives for the site-wide RI/FS surface soil sampling program. Providing data to evaluate the potential for migration of contaminants via the ground-water pathway is absent from this list of objectives. This significant omission should be addressed because, according to subsequent RI sections, surface soils in many of the OU 2 units are the most highly contaminated media present. Leachate from these contaminated surface soils is a likely source of ground-water contamination, but it is not considered in the fate and transport modeling. Omitting consideration of leachate from contaminated surface soils will lead to underestimating the predicted contaminant concentrations in the Great Miami Aquifer. This data gap should be addressed in the RI report. This comment also applies to Section 2.1.3.2, where subsurface soil sampling objectives are presented.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 2.1.2.1
Original Specific Comment #12

Commentor: Saric
Pg. #: 2-10 **Line #:** 15 **Code:**

Comment: The RI report states that the primary objectives of RI and FS surface soil sampling were to characterize the nature and extent of contamination in the surface soil and to provide data for the baseline risk assessment. However, only seven RI/FS surface soil samples were collected for all OU 2 study areas. In addition, these samples were analyzed only for radionuclides. Because the CIS did not provide data on the nature and extent of nonradiological contaminants in the surface soil, the RI report fails to adequately characterize the nonradiological contaminants in surface soils. This data gap should be addressed.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 2.1.3.2
Original Specific Comment #13

Commentor: Saric
Pg. #: 2-11 **Line #:** 38 **Code:**

Comment: The RI report states that a regionally extensive clay layer divides the upper and lower portions of the Great Miami Aquifer. The elevation of the clay unit does distinguish the upper and lower portions of the Great Miami Aquifer; however, the clay unit is not regionally extensive and was not modeled as such by DOE in the three-dimensional ground-water flow models. DOE should describe the clay layer as a transgressive unit present in the northern portion of the site and absent in the southern portion.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.1.3.4

Pg. #: 2-22 Line #: 17

Code:

Original Specific Comment #14

Comment: The RI report states that ground-water monitoring wells installed as part of the RI/FS and wells installed to augment the RCRA program were sampled quarterly for parameters listed in Tables 2-2 and 2-3. The wells were sampled quarterly, and the samples were analyzed for radionuclides. However, samples were analyzed for hazardous substance list (HSL) organic compounds only during the initial sampling round. Although HSL organic compounds do not appear to be a pervasive ground-water contaminant in OU 2, basing future decisions on one round of sampling and analysis is questionable. DOE should consider collecting ground-water samples for full HSL analyses and incorporating the results into the OU 5 RI report.

Response:**Action:**

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.1.4

Pg. #: 2-27 Line #: 18

Code:

Original Specific Comment #15

Comment: The contract laboratory program (CLP) SOW includes specific procedures for laboratory data review; however, the data review required in the CLP SOW is not a substitute for an independent data validation. DOE should clarify how the data validation was conducted.

Response:**Action:**

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.1.4.2

Pg. #: 2-27 Line #: 32-42

Code:

Original Specific Comment #16

Comment: The text indicates that none of the CIS data has been validated but that documentation will support validation to level 3 or level 5 but not level 4. The report subsequently states that "consequently, the CIS data have been used both in the characterization of nature and extent of contamination and in the quantification of risk." Therefore, it is clear that nonvalidated CIS data, which was also collected without a U.S. EPA-approved quality assurance project plan (QAPjP), has been used in the RI report to quantify risk. The report should clearly state whether the use of this data alone without supporting RI/FS data to quantify risk has been approved by U.S. EPA or the Ohio Environmental Protection Agency (OEPA).

Response:**Action:**

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.1.4.3

Pg. #: 2-28 Line #: 17-27

Code:

Original Specific Comment #17

Comment: The text initially states that the RI/FS QAPjP contains no specific methods and requirements for radiological analysis and data documentation; however, the text states that "the validation process consisted of reviewing the documentation for completeness, consistency, and compliance with the quality control (QC) criteria established under the RI/FS QAPjP." These confusing and contradictory statements imply that RI/FS radiological data may not be appropriately validated. The fact that "the data packages did not contain information on sample preparation or instrument calibration and, until mid-1991, did not contain certificates of analyses" supports this argument. This discrepancy should be clarified, and the text should indicate the degree to which RI/FS radiological data has been validated and the degree to which data is usable.

Response:

Section #: 2.2.2

Pg. #: 2-31 Line #: 23

Code:

Original Specific Comment #23

Comment: The RI/FS surface soil sampling location is positioned on the opposite side of the drainage ditch that would collect any contaminated particulate runoff from the SWL. This sampling location may provide information concerning transport of contaminants via the air pathway but will not support characterization of the surface water runoff pathway. DOE should provide its rationale for this sampling location. U.S. EPA believes that the resulting data gap is significant and that DOE will have to collect additional samples downstream of the SWL.

Response:**Action:**

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.2.2

Pg. #: 2-31 Line #: 18-25

Code:

Original Specific Comment #24

Comment: The text indicates that a total of seven surface soil samples were collected in the SWL study area for radionuclide analyses during the CIS and RI/FS. However, only one of these samples was actually collected from within the boundary of the landfilled waste area. Also, no analyses were performed to characterize surface soils for metals or organics. Because of these two major data gaps, none of the surface soil sampling objectives stated in Section 2.2.2 of the RI report has been achieved. The nonfulfillment of these objectives should be identified in the RI report as a data gap, and DOE should identify future investigations that will meet the RI/FS data objectives.

Response:**Action:**

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.2.3

Pg. #: 2-31 Line #: 41-42

Code:

Original Specific Comment #25

Comment: The text states that Test Pit No. 8 was excavated west of the SWL on the northern side of the drainage ditch. Figure 2-2 shows the location of this test pit to be north of the landfill and south of the drainage ditch. Discrepancies regarding the location of Test Pit No. 8 should be addressed. Also, the text should indicate why the test pit was installed in an area located outside the boundaries of the landfilled waste area.

Response:**Action:**

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.2.3

Pg. #: 2-31 to 2-32 Line #: NA

Code:

Original Specific Comment #26

Comment: The DOE report entitled "Modification to the OU 2 Sampling and Analysis Plan," dated April 17, 1991, indicates that two distinct and separate borings would be advanced in the abandoned evaporation pond on the west side of the SWL. However, Lines 17 and 18 on Page 2-33 of the RI report state that a single boring (1718/1808) was advanced in the evaporation pond. In addition, Figure 2-2 indicates that this single boring was located 25 feet east of the evaporation pond. The nature and extent of contamination associated with the evaporation pond constitutes a data gap that should be identified in the RI report. Similarly, the locations of the CIS and RI/FS subsurface borings indicate that waste cells 1, 4, and 5 may not have been sampled. The RI report should identify the modification to the work plan and discuss potential data gaps resulting from this modification. The report should also discuss whether the data coverage is adequate to define the landfill's contents considering findings from the trenching activities and the lack of data for three of the disposal cells.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.4 Pg. #: 2-33 Line #: 35 Code:
Original Specific Comment #27

Comment: DOE collected sediment samples during the CIS and analyzed them for radionuclides. The issue of whether metals or organic contamination is present in surface water or sediment remains a data gap. At a minimum, additional samples should be collected from sediments downstream of the SWL to obtain data for metals and organics and to verify the usability of the CIS radionuclide data for this area.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.4 Pg. #: 2-35 Line #: 1 Code:
Original Specific Comment #28

Comment: DOE collected one RI/FS surface water sample from an area upstream of the SWL. DOE did not collect RI/FS surface water samples from a location that would have supported characterization of the potential impact of the SWL on surface water in this area. DOE should address this data gap.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.5 Pg. #: 2-35 Line #: 10-11 Code:
Original Specific Comment #29

Comment: This bulleted item states that one of the objectives of ground-water sampling is to "characterize perched ground water which could be encountered during remediation of the landfill." The meaning and purpose of this objective is not clear. The objective of the ground-water study should be to characterize the nature and extent of ground-water contamination associated with the landfill regardless of the eventual remediation activities. The objective should be clarified.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.5 Pg. #: 2-35 Line #: 15 Code:
Original Specific Comment #30

Comment: The RI report inaccurately states that ground water from several wells was sampled quarterly and analyzed for radionuclides, VOCs, semivolatile organic compounds (SVOC), pesticides/PCBs, metals, and general ground-water quality parameters. Samples from wells 1035 and 1037 were not analyzed for VOCs, SVOCs, or pesticides/PCBs. Samples from well 1038 were not analyzed for VOCs, SVOCs, or pesticides/PCBs (with the exception of one sampling round, when the sample was analyzed for six VOCs). Samples from well 2027 were analyzed in only two rounds for VOCs, SVOCs, or pesticides/PCBs, and sample from well 3037 was analyzed for VOCs, SVOCs, or pesticides/PCBs in only one sample round. The RI report should accurately present the sampling frequency and analytes for each well. The limited analyses for the parameters present a data gap that DOE should address.

Response:
Action:

Commenting Organization: U.S. EPA
 Section #: 2.3.5
 Original Specific Comment #41
 Comment: Specific Comment No. 29 regarding objectives for the characterization of perched ground water also applies here.
 Response:
 Action:

Commentor: Saric

Pg. #: 2-44 Line #: 24

Code:

Commenting Organization: U.S. EPA
 Section #: 2.3.5
 Original Specific Comment #42
 Comment: The RI report states that seven RI/FS wells are located in the vicinity of the Lime Sludge Ponds. However, both Figure 2-9 and Table 2-6 list nine wells in the vicinity of the sludge ponds. DOE should correct this discrepancy.
 Response:
 Action:

Commentor: Saric

Pg. #: 2-44 Line #: 27

Code:

Commenting Organization: U.S. EPA
 Section #: 2.3.5
 Original Specific Comment #43
 Comment: The text states that seven wells were completed in the vicinity of the Lime Sludge Ponds; however, Figure 2-9 indicates that DOE has only one well (4101) screened in the Great Miami Aquifer downgradient of the Lime Sludge Ponds, and this well was not sampled. Therefore, the nature and extent of ground-water contamination in this aquifer as a result of potential contaminant migration from the Lime Sludge Ponds have not been determined. The RI report should identify this issue as a remaining data gap.
 Response:
 Action:

Commentor: Saric

Pg. #: 2-44 Line #: NA

Code:

Commenting Organization: U.S. EPA
 Section #: 2.3.5
 Original Specific Comment #44
 Comment: The RI inaccurately states that water from seven wells in the vicinity of the Lime Sludge Ponds was sampled and analyzed quarterly for radionuclides, VOCs, SVOCs, pesticides/PCBs, metals, and general ground-water quality parameters. Samples from well 1039 were analyzed only for radionuclides and metals; samples from well 1134 were analyzed quarterly only for radionuclides and for VOCs in only one sampling round; well 1176 was never sampled; samples from well 1210 were analyzed in only one round for total uranium; samples from well 1042 were analyzed only for radionuclides and metals; samples from well 2042 were analyzed for radionuclides and metals quarterly and for VOCs and SVOCs in only one sampling round. The RI report should accurately present the sampling frequency and analytes for each well. The RI/FS work plan does not provide specific information regarding sampling frequency and does not contain any information concerning wells 1134, 1176, and 1220. Regardless, the data collected to date is not sufficient to determine whether specific analytes are not of concern. In addition, no 1000-series wells are located west of the sludge ponds to allow determination of whether ground-water quality has been impacted by the sludge ponds. The limited analyses for the parameters represent a data gap that should be addressed.
 Response:
 Action:

Commentor: Saric

Pg. #: 2-44 Line #: 29

Code:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.3.5

Pg. #: 2-44 Line #: 29

Code:

Original Specific Comment #45

Comment: None of the RI/FS ground-water data has been validated. Complete data validation to determine data usability for characterization and risk assessment purposes should be completed prior to submittal of the revised RI report.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.5.2

Pg. #: 2-55 Line #: 12-42

Code:

Original Specific Comment #46

Comment: DOE reports that PCB-contaminated oils were sprayed on the Inactive Flyash Pile to control dust (Page 2-55, Line 6); however, Section 2.5.2 does not indicate that samples were analyzed for PCBs in any of the surface soil investigations for the Inactive Flyash Pile. On Page 4-76, Line 4, the text indicates that four ES surface soil samples were analyzed for PCBs. This discrepancy should be addressed. If ES data is available, it alone cannot be used to quantify risk; therefore, none of the PCB-related objectives stated in Section 2.5.2 has been met. DOE should identify this issue as a remaining data gap in the RI report.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.5.2

Pg. #: 2-55 Line #: 29-42

Code:

Original Specific Comment #47

Comment: The text indicates that a total of only five surface soil samples were collected at the Inactive Flyash Pile during the CIS and RI/FS and that these samples were analyzed for radionuclides. However, no samples were collected during the RI/FS and analyzed for other parameters. Therefore, a data gap remains regarding organic and metals contamination in the surface soils because none of the objectives stated in Section 2.5.2 has been met with regard to these contaminants. Also, it is highly unlikely that these surface soil samples alone can be used to accurately define the nature and extent of radionuclide contamination in an area about 5 acres in size. Therefore, the nature and extent of radionuclide contamination in the Inactive Flyash Pile constitute a data gap that should be identified in the RI report.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.5.3

Pg. #: 2-57 Line #: 12-13

Code:

Original Specific Comment #48

Comment: The text states that two hand auger borings were advanced in the Inactive Flyash Pile during the ES; however, on Page 4-76, Line 15, the text states that "five borings were drilled." A discrepancy apparently exists, or information has been omitted. This discrepancy should be addressed.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.4.2

Pg. #: 2-47 Line #: 37-38

Code:

Original Specific Comment #49

Comment: The text indicates that surface soils in the Active Flyash Pile were not analyzed for PCBs even though the text in Section 2.4.1 indicates that PCB-contaminated oils were used to control dust on the Active Flyash Pile. This data gap should be

addressed in the RI report. DOE should clearly indicate that the RI has not met PCB-related objectives stated in Section 2.4.2, particularly those regarding the determination of the nature and extent of contamination, the potential for exposure via the direct contact pathway, and the evaluation of the potential for migration via the air pathway.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 2.4.2
Original Specific Comment #50

Commentor: Saric
Pg. #: 2-47 Line #: 38-39 Code:

Comment: The text states that surface soils from the Active Flyash Pile were not sampled during the CIS or RI/FS. DOE has acknowledged that only CIS or RI/FS data can be used to quantify risk (although it remains unclear whether CIS data alone can actually be used for these purposes). Therefore, a data gap regarding Active Flyash Pile surface soils remains because none of the objectives stated in Section 2.4.2 can be met with the existing data. DOE should clearly indicate this in the RI report.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: Figure 2-11
Original Specific Comment #51

Commentor: Saric
Pg. #: 2-49 Line #: Code:

Comment: Figure 2-11 indicates that nine surface soil samples were collected during the ES; however, on Page 2-47, Line 36, the text states that only eight samples were collected. This discrepancy should be addressed.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 2.4.3
Original Specific Comment #52

Commentor: Saric
Pg. #: 2-50 Line #: 2-31 Code:

Comment: The text indicates that no subsurface samples collected from the Active Flyash Pile were analyzed for PCBs despite the fact that the text on Page 2-47, Line 18, indicates that PCB-contaminated oils were used to control dust. Therefore, none of the PCB-related objectives stated in Section 2.4.3 has been met. DOE should indicate in the RI report that this remains a data gap.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 2.4.4
Original Specific Comment #53

Commentor: Saric
Pg. #: 2-50 Line #: 36 Code:

Comment: The RI report states that surface water runoff from the Active Flyash Pile is radial; however, DOE collected samples from only the west and northeast sides of the pile. Because surface water runoff does flow to the south and southeast toward the storm water outfall ditch, surface water and sediment samples should also be collected south and east of the Active Flyash Pile.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 2.4.4

Commentor: Saric
Pg. #: 2-50 Line #: 38 Code:

Original Specific Comment #54

Comment: The RI report inaccurately states that sediment samples were analyzed for radionuclides, VOCs, SVOCs, pesticides/PCBs, metals, and general water quality parameters. Sediment samples were analyzed for only radium 226, radium 228, and total uranium. The RI report should accurately present the relevant sampling frequency and analytes. The limited analysis presents a significant data gap that DOE should address because the Active Flyash Pile contains constituents other than those analyzed for that could enter the environment.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.4.4

Pg. #: 2-50 **Line #:** 38

Code:

Original Specific Comment #55

Comment: The RI report inaccurately states that sediment samples were analyzed for radionuclides, VOCs, SVOCs, pesticides/PCBs, metals, and general water quality parameters. Only one of the four sediment samples was analyzed for VOCs, SVOCs, pesticides/PCB, metals, and general water quality parameters. Data for this single sample has not been validated. The RI report should accurately present the relevant sampling frequency and analytes. The limited analyses for the parameters present a significant data gap that DOE should address.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.4.4

Pg. #: 2-50 **Line #:** 38

Code:

Original Specific Comment #56

Comment: The RI report inaccurately states that surface water samples were analyzed for radionuclides, VOCs, SVOCs, pesticides/PCBs, metals, and general water quality parameters. Only two of four surface water sampling locations were sampled. Samples from these two locations were analyzed only for radionuclides, metals, and general water quality parameters. The RI report should accurately present the relevant sampling frequency and analytes. The limited analyses for the parameters present a significant data gap that DOE should address.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.5.4

Pg. #: 2-58 **Line #:** 13

Code:

Original Specific Comment #57

Comment: During the RI/FS, DOE collected two surface water and sediment samples west of the Inactive Flyash Pile. Surface water runoff from the Inactive Flyash Pile also flows east and south, but no samples were collected in these areas. DOE should address this data gap.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 2.5.4

Pg. #: 2-58 **Line #:** 22

code:

Original Specific Comment #58

Comment: The RI report inaccurately states that two sediment samples collected west of the Inactive Flyash Pile were analyzed for radionuclides, VOCs, SVOCs, pesticides/PCBs, and metals. The two sediment samples were analyzed only for radium 226, radium 228, and total uranium. The RI report should accurately present the relevant sampling frequency and analytes. Because the Inactive Flyash

Pile contains several other radionuclides and potentially contains other contaminants that can enter the environment, the analysis of sediment samples did not characterize the nature of contamination in the Inactive Flyash Pile area.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 2.5.4
Original Specific Comment #59

Commentor: Saric
Pg. #: 2-58 Line #: 22

Code:

Comment: The RI report inaccurately states that two surface water samples collected west of the Inactive Flyash Pile were analyzed for radionuclides, VOCs, SVOCs, pesticides/PCBs, metals, and general water quality parameters. Only one surface water sample was analyzed for radium 226, radium 228, total uranium, metals, and general water quality parameters. Thus, this analysis did not characterize the nature of contamination in the Inactive Flyash Pile area. DOE should address this data gap.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 2.5.5
Original Specific Comment #60

Commentor: Saric
Pg. #: 2-58 Line #: 37

Code:

Comment: The RI report inaccurately states that water from six RI/FS monitoring wells in the Inactive Flyash Pile area was sampled quarterly and analyzed for radionuclides, VOCs, SVOCs, pesticides/PCBs, metals, and general water quality parameters. All wells were sampled quarterly and the samples were analyzed for radionuclides except for well 1711, which was never sampled. Water samples from well 1016 were analyzed only for VOCs, SVOCs, and pesticides/PCBs; none of the other well samples was analyzed for these parameters. DOE should address these data gaps.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 2.5.5 and Figure 2-17
Original Specific Comment #61

Commentor: Saric
Pg. #: 2-60 Line #: NA

Code:

Comment: Figure 2-17 shows the locations of monitoring wells near the Inactive Flyash Pile. The current monitoring well network includes no wells downgradient of the Inactive Flyash Pile. While DOE has acknowledged that the current system cannot determine this unit's effect on ground-water quality, U.S. EPA believes that monitoring wells placed between the Inactive Flyash Pile and the South Field may enable DOE to make this determination. Because Paddys Run, the Inactive Flyash Pile, and the South Field all exhibit separate and distinct source characteristics, their individual impact on ground-water quality should be determined before any remedial actions are implemented. DOE should acknowledge in the RI report that the degree to which the OU 2 units in this study area are affecting ground-water quality remains a major data gap. In addition, DOE should propose additional wells that could be used to determine whether OU 2 sources are responsible for ground-water contamination in the OU 2 area.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 2.6.1
Original Specific Comment #62

Commentor: Saric
Pg. #: 2-62 Line #: 36-37

Code:

Comment: The RI report states that a regionally extensive clay layer (the clay interbed) divides the upper and lower portions of the Great Miami Aquifer. The elevation of the clay unit does distinguish the upper and lower portions of the Great Miami Aquifer, but it is not regionally extensive and was not modeled as such by DOE in the three-dimensional flow model. This issue should be discussed in the RI. Additionally, Figure 3-7 indicates that the thickness of the clay interbed ranges from 10 to 20 feet; however, the text states that its thickness ranges from 5 to 15 feet. This discrepancy should be addressed.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 3.1.3.3
Original Specific Comment #77

Commentor: Saric
Pg. #: 3-23 **Line #:** 1-4

Code:

Comment: The text states that increases in runoff from Paddys Run have led to the formation of a ground-water mound near the K-65 silos. While this does appear to be occurring at this location, Figures 3-11 and 3-12 indicate that in May 1989 and December 1989, a large ground-water trough existed in the areas north of the K-65 silos. The characteristics of and reasons for this phenomenon should be provided if known.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 3.1.6.3
Original Specific Comment #78

Commentor: Saric
Pg. #: 3-39 **Line #:** 40-41

Code:

Comment: The text states that the 100-year flood plain of the Great Miami River extends north along Paddys Run to a point 2,000 feet south of the FEMP boundary. Figure 3-18 indicates that this point is actually only 600 feet south of the FEMP boundary. This discrepancy should be addressed.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 3.2.2
Original Specific Comment #79

Commentor: Saric
Pg. #: 3-46 **Line #:** 32

Code:

Comment: The description of waste in the SWL should be revised to include observations from the fall 1992 trenching investigation.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 3.2.2
Original Specific Comment #80

Commentor: Saric
Pg. #: 3-51 **Line #:** 25

Code:

Comment: Review of the well completion and boring logs indicates that well 1037 is screened below the zone monitored by wells 1035 and 1038. This may account for the large difference in ground-water elevations between wells 1038 and 1035 compared to well 1037. In addition, well 1037 is screened from 28 to 39 feet below ground surface (bgs) in soil classified as moist, low-plasticity clay. However, a unit of wet sand and gravel is present from 25 to 28 feet bgs. The screened interval should have intersected the sand and gravel zone. A replacement well for well 1037 should be installed to provide accurate data on ground-water flow and quality.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 3.3.2

Pg. #: 3-58 Line #: 27

Code:

Original Specific Comment #81

Comment: The text states that the ground-water elevation in the Great Miami Aquifer averages between 515 and 520 feet above mean sea level (msl) in the vicinity of the Lime Sludge Ponds. Figure 3-31 indicates that at well 2042 (the only well in the vicinity of the Lime Sludge Ponds screened in the Great Miami Aquifer), the ground-water elevation ranges between 521 and 525 feet above msl. This discrepancy should be addressed.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 3.6.2

Pg. #: 3-63 to 3-69 Line #: NA

Code:

Original Specific Comment #82

Comment: The text describes the geology and ground-water hydrology of the South Field Flyash Pile area. A map should accompany this text to delineate locations where the glacial overburden is absent. Potentiometric surface maps should also be constructed to show the direction of horizontal ground-water flow in both the upper and lower portions of the Great Miami Aquifer. This information can be used to determine whether any significant difference in flow direction occurs in the aquifer with increasing depth. This information could be easily added to existing maps.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 3.6.2

Pg. #: 3-63 Line #: 25

Code:

Original Specific Comment #83

Comment: The South Field disposal area contains disposal material up to 30 feet bgs; however, this is not shown on the cross sections. The cross sections should be revised to accurately indicate site conditions.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 3.6.2

Pg. #: 3-63 Line #: 25

Code:

Original Specific Comment #84

Comment: Borings into the geologic units underlying the fill material in the South Field are not deep enough to characterize the hydrogeology of these units. The existing borings sampled only the upper few feet of the till unit. Additional borings should be advanced at strategic locations and sampled through the entire till unit using a sampling technique such as the hydropunch; after this permanent and 1000 and 2000 series wells should be installed. The areal extent and thickness of the till in the South Field are unknown. This data gap should be addressed.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 3.6.2

Pg. #: 3-63 Line #: 25

Code:

Original Specific Comment #85

Comment: No wells are located within the boundary of the South Field. Characterizing the ground-water flow system and determining the impact of the South Field on

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.1.2

Pg. #: 4-2 Line #: 13-26

Code:

Original Specific Comment #88

Comment: This section discusses background concentrations for soils; however, the discussion does not mention background sampling locations or the number of samples represented by the various background data sets. In addition, it does not present or reference raw data or the calculations used to determine the background values. This information should be included in the RI report.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.1.2

Pg. #: 4-2 Line #: 29-31

Code:

Original Specific Comment #89

Comment: The text implies that different waste areas in OU 2 have different background soil concentration values. DOE should clearly state the rationale for using different background values and should include the different background soil concentrations used for the various OU 2 waste areas.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.1.2

Pg. #: 4-2 Line #: 14-17

Code:

Original Specific Comment #90

Comment: The text states that statistics used to calculate background values required that for background samples with nondetectable concentrations, one-half the value of the sample quantitation limit (SQL) was assigned to the nondetected result. However, Table 4-1 shows background concentrations for soils and ground water and implies that many of the background concentrations listed are SQLs, not one-half the SQLs. Review of the discussion and data tables in Section 4 indicates that OU 2 RI samples are compared to these SQLs, not one-half the SQLs as stated in Section 4.1.2. DOE should address this discrepancy, which has major impacts on the determination of the nature and extent of contamination as well as the risk assessment.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.1.2

Pg. #: 4-2 Line #: 38

Code:

Original Specific Comment #91

Comment: The text states that background values have not been calculated for on-site surface water. Because on-site surface water bodies constitute a medium of concern in the OU 2 RI report, the lack of background data remains a significant data gap. DOE should identify this as a data gap and should provide background surface water data.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.1.2, Table 4-1

Pg. #: 4-3 Line #: NA

Code:

Original Specific Comment #92

Comment: Table 4-1 lists calculated background concentrations for soils and ground water; however, the values presented for uranium, radium, thorium, and their isotopes

differ significantly from those proposed by DOE in its letter report to U.S. EPA entitled "Background Concentrations for Use in Operable Unit 2 Remedial Investigation Report," dated April 4, 1992. To alleviate the confusion caused by these discrepancies, DOE should clearly and thoroughly present the following: (1) how background values have been calculated; (2) all the data used to calculate these values; and (3) which values DOE intends to use.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.1.2, Table 4-1
Original Specific Comment #93

Commentor: Saric
Pg. #: 4-3 Line #: NA

Code:

Comment: Specific Comment No. 87 discusses the issue of estimated total uranium values. This issue should also be addressed here relative to the determination of, usability of, and uncertainty associated with the estimated background concentration of total uranium.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.1.2, Table 4-1
Original Specific Comment #94

Commentor: Saric
Pg. #: 4-4 Line #: NA

Code:

Comment: Table 4-1 gives background concentrations for metals in ground water in terms of upper tolerance limits (UTL); however, the UTLs listed for arsenic, barium, beryllium, cadmium, nitrate, and lead are above existing maximum contaminant levels (MCL). The use of such high UTL background levels is inappropriate and may lead to inaccurate risk assumptions. This issue needs to be thoroughly addressed in the RI report.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.1.2
Original Specific Comment #95

Commentor: Saric
Pg. #: 4-6 Line #: 11

Code:

Comment: The text implies that all OU 2 waste areas are hydraulically downgradient (in terms of ground water) from the former production area. This assertion is incorrect and should be rephrased or removed from the text.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.1.3
Original Specific Comment #96

Commentor: Saric
Pg. #: 4-7 Line #: 1-2

Code:

Comment: The text states that the major issue identified by the validation process was matrix interference with VOCs. The text should identify and discuss the media and samples (ES, CIS, or RI/FS) that were affected.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.2.3
Original Specific Comment #97

Commentor: Saric
Pg. #: 4-8 Line #:

Code:

Comment: The descriptions of the analyses in Section 4.2.3 and elsewhere in Section 4 do not agree with the corresponding discussions presented in Section 2. For example,

Section 2.2.2 states that the ES samples were analyzed for radionuclides, PCBs, and asbestos; Section 4.2.3 states that ES samples were analyzed for radionuclides, PCBs, asbestos, VOCs, and TCLP metals. These and subsequent discussions should be checked for accuracy and consistency and should be revised accordingly.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.3

Pg. #: 4-8

Line #: 24-34 Code:

Original Specific Comment #98

Comment: The text states that ES, CIS, and RI/FS surface soil samples were analyzed for radionuclides; however, data presented in Table 4-2 indicates that different suites of radionuclides were analyzed for in the various investigations. Therefore, the discussions in Section 4 and the corresponding discussions in Section 2 should be revised to clearly indicate which analyses were performed during the various studies.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.3.1

Pg. #: 4-10

Line #: 20-37

Code:

Original Specific Comment #99

Comment: Soil data from the SWL generally indicates that total uranium concentrations are higher in surface soils than in subsurface soils such as fill and underlying native soils. DOE should acknowledge these trends and attempt to explain them.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.3.1

Pg. #: 4-10 to 4-20

Line #: NA

Code:

Original Specific Comment #100

Comment: This section presents radionuclide data for subsurface SWL media. However, none of the CIS subsurface data is discussed. DOE should clearly indicate whether the CIS subsurface radionuclide data will be used to determine the nature and extent of contamination and to quantify risk. If DOE intends to use the data for these purposes, the data should be discussed in the RI report in the same manner that the RI/FS data is presented. If not, the CIS data included in Table 4-3 and Figure 4-3 should be removed from the RI report.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.3.1

Pg. #: 4-10

Line #: 27

Code:

Original Specific Comment #101

Comment: The RI report concludes that a non-OU 2 area is the source of surface soil contamination. While this conclusion may be accurate, significant levels of radionuclide contamination are present in the surface soils. The RI report should provide recommendations for characterizing the source area and the nature and extent of this contamination. In addition, the recommendation should identify the OU RI that will address this data gap.

Response:
Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.3.1
 Original Specific Comment #102

Commentor: Saric
 Pg. #: 4-10 Line #: 27

Code:

Comment: The RI report should discuss the uranium contamination present in boreholes 1035 and 49-06. These boreholes are outside the landfill area and below the base of the SWL.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.3.1
 Original Specific Comment #103

Commentor: Saric
 Pg. #: 4-10 Line #: 34-35

Code:

Comment: This line states that five of seven RI/FS measurements of total uranium in native soils underlying the fill were greater than background. Figure 4-3 and Table 4-3 indicate that only six native soil samples were collected in areas where fill overlies the native soils. These samples were taken from borings 1720, 1721, 1722, and 1718/1808. However, boring logs for 1718/1808 indicate that no fill was encountered at this location, possibly because it was located on a berm between landfill cells. At this location, total uranium concentrations in the two native soil samples were below background. The text should be modified to reflect the fact that all RI/FS native soil samples collected below fill show total uranium concentrations between 2 and 40 times background concentrations, suggesting substantial vertical migration of uranium. The CIS data confirms these trends.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.3.1, Figure 4-2
 Original Specific Comment #104

Commentor: Saric
 Pg. #: 4-12 Line #: NA

Code:

Comment: Figure 4-2 indicates that boring 620 is located outside the landfill cell area; however, Figure 2-2 indicates that this boring is located within the landfill cell area. This discrepancy should be addressed.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.3.1, Table 4-3
 Original Specific Comment #105

Commentor: Saric
 Pg. #: 4-16 Line #: NA

Code:

Comment: Boring logs for RI/FS borehole 1722 indicate that soil was recovered from the 7.0- to 8.5-foot interval; however, no analytical data for this deep fill sample is presented in Table 4-3. This data or the reason for its omission should be provided in the RI report.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.3.1, Table 4-3
 Original Specific Comment #106

Commentor: Saric
 Pg. #: 4-13 to 4-17 Line #: NA

Code:

Comment: In Table 4-3, the description for footnote (c) states that total uranium values for CIS samples are calculated estimates; however, five RI/FS samples presented at the end of this table are tagged with this footnote. This discrepancy should be addressed. DOE should clearly define which values are measured and which are estimated.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.3.2

Pg. #: 4-20 Line #: 12

Code:

Original Specific Comment #107

Comment: This text discusses the frequent presence of common laboratory contaminants in samples and associated blanks. As described earlier (Section 2.1.4.4), data validation converts possible blank contamination to either presumed artifact (qualified "U") or presumed site contamination. The text and supporting tables of this site characterization section should use only validated data. If a common laboratory contaminant is not found in any blank associated with a sample or group of samples but is found in numerous others, it may still be an artifact and may be dismissed as a CPC for the risk assessment. If this is done, it should be stated explicitly in the text. DOE should modify this and subsequent text to clarify which situation (prevalidation or postvalidation) is being discussed.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.3.3, Table 4-6

Pg. #: 4-25 Line #: NA

Code:

Original Specific Comment #108

Comment: The table gives the background concentration of mercury as 0.29 milligram per kilogram (mg/kg) and the site range as 0.14 to 0.20 mg/kg. It then says that all results exceed background. DOE should correct this error.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.3.2 and 4.2.3.3, Tables 4-5 and 4-6

Pg. #: 4-21 to 4-25 Line #:

Code:

Original Specific Comment #109

Comment: Tables 4-5 and 4-6 present subsurface organic and inorganic data, respectively. However, the method of data presentation, particularly with respect to the frequency of detection and the frequency above background, is misleading. Data for locations outside the fill areas and for native soils below the fill areas has been combined with data for actual fill material. Data for these three areas should be reported separately (as in the case of radionuclide data) so that the nature and extent of organic and inorganic contamination can be more readily evaluated.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.4.1

Pg. #: 4-26 Line #: 16

Code:

Original Specific Comment #110

Comment: DOE did not collect any sediment samples in the SWL area during the RI/FS for radionuclide analysis. This adds additional uncertainty to the estimation of risk derived from the existing data. At a minimum, an RI/FS sample should have been collected to verify the usability of the CIS data for this area. DOE should indicate how this data gap will be resolved.

Response:

Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.4.1

Pg. #: 4-26 Line #: 18

Code:

Original Specific Comment #111

Comment: The RI report states that a potential source of the radionuclide contamination in the sediment samples from the SWL area is from the northwest portion of the production area. U.S. EPA notes that the CIS data has been available for several years; DOE should have identified this data gap and collected RI/FS samples to address it. Additional sediment samples should be collected to determine the source of the radionuclide contamination and, more importantly, to determine whether the SWL is a source.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.4.1

Pg. #: 4-26 **Line #:** 24

Code:

Original Specific Comment #112

Comment: The one surface water sample collected from the drainage ditch north of the SWL was inadequate to characterize the nature and extent of surface water contamination or to determine whether the SWL is the source of the surface water contamination. As stated previously, the surface water sample was collected from an area upstream from the SWL. Collecting one sample from this location during the RI/FS constitutes an inadequate sampling strategy. Additional samples should be collected to characterize the nature and extent of contamination as well as to determine whether the SWL is the source of the contamination.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.4.1

Pg. #: 4-26 **Line #:** 23

Code:

Original Specific Comment #113

Comment: The text states that the single surface water sample collected at the SWL exhibited a total uranium concentration of 26.0 micrograms per liter ($\mu\text{g/L}$); however, Figure 4-4 indicates that two surface water samples were collected from this location that exhibited concentrations of 26.0 $\mu\text{g/L}$ and 42.0 $\mu\text{g/L}$. DOE should address this discrepancy and explain why only the lower value is reported in the text and data tables.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.4.2

Pg. #: 4-26 **Line #:** 33

Code:

Original Specific Comment #114

Comment: The RI/FS work plan states that a sediment sample would be collected and analyzed for organic compounds. DOE did not meet this requirement. DOE should discuss this deviation from the work plan, identify resulting data gaps, and take measures to correct them.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.4.3

Pg. #: 4-26 **Line #:** 36

Code:

Original Specific Comment #115

Comment: As stated above, collecting one surface water sample from upstream of the SWL constitutes an inadequate sampling strategy; additional locations should be considered for further sampling.

Response:
Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.4.3
 Original Specific Comment #116

Commentor: Saric
 Pg. #: 4-26 Line #: 36

Code:

Comment: DOE did not collect any sediment samples for metals analysis from the drainage ditch north of the SWL. The RI/FS work plan states that a sediment sample would be collected and analyzed for metals. DOE should discuss this deviation from the work plan, identify resulting data gaps, and take measures to correct them.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.5
 Original Specific Comment #117

Commentor: Saric
 Pg. #: 4-29 Line #: 10-13

Code:

Comment: The text states that ES Test Pit No. 8 is situated within the western boundary of the landfill. Although DOE acknowledges that ground-water samples collected using nonstandard methods are not comparable to ground-water samples collected from monitoring wells, DOE does not use the ground-water samples collected from Test Pit No. 8 as source terms in the ground-water modeling. Instead of this data being used as stated, the issue of determining source terms for SWL leachate remains a data gap. DOE should use the leachate as a source term or provide further justification for not using it.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.5.1
 Original Specific Comment #118

Commentor: Saric
 Pg. #: 4-29 Line #: 23

Code:

Comment: The RI report does not present the results of radionuclide analysis of ground-water samples from well 1037. Well 1037 is hydraulically downgradient from the SWL and is critical to characterizing the nature and extent of ground-water contamination in the SWL area. As noted above, a replacement well for well 1037 should be installed and sampled. In addition, if well 1037 was sampled, the results should be presented. If it was not sampled, DOE should discuss the rationale for this decision.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.5.1
 Original Specific Comment #119

Commentor: Saric
 Pg. #: 4-29 Line #: 25

Code:

Comment: The RI report inaccurately states that elevated levels of uranium in well 1035 were not confirmed in subsequent sampling rounds. In January 1990, ground-water samples collected from well 1035 had elevated levels of total uranium and thorium. The RI report should be revised accordingly.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.5.1
 Original Specific Comment #120

Commentor: Saric
 Pg. #: 4-29 Line #: 26-27

Code:

Comment: This line states that "because the upgradient well (2052) contains higher concentrations of uranium, an upgradient source is indicated for dissolved uranium in the Great Miami Aquifer at this location." Figure 4-5 indicates that

well 2052 is downgradient of the SWL. This discrepancy should be clarified, and the conclusion drawn should be re-evaluated.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.5.1

Pg. #: 4-29 Line #: 26

Code:

Original Specific Comment #121

Comment: The RI report concludes that there is a source upgradient of the SWL because ground-water samples from upgradient well 2027 have higher uranium concentrations than those from downgradient well 2037. Of the 17 samples collected from these two wells and analyzed, data validation was conducted for only one sample, and that data was rejected. Therefore, it seems inappropriate to draw conclusions regarding the source of ground-water contamination near the SWL. DOE should provide further support for its hypothesis or remove it.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.5.2

Pg. #: 4-35 Line #: 1

Code:

Original Specific Comment #122

Comment: No conclusions concerning the level of organic contamination in the perched water table can be drawn. Only one sample was collected from well 1038, and it was analyzed for only six VOCs. DOE should clearly indicate the limitations of the data and state that this is a data gap.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.2.5.3

Pg. #: 4-35 Line #: 7

Code:

Original Specific Comment #123

- Comment:
1. Ground-water samples from downgradient well 1037 were not analyzed; therefore, no conclusions can be drawn regarding ground-water contamination in the perched water table aquifer in the SWL area. DOE should collect additional samples and include the analytical results in the RI report.
 2. Ground-water samples collected from wells 1035 and 1038 were not analyzed for antimony or beryllium. Both of these metals were detected at levels above background in subsurface soil samples collected below the SWL. Additional ground-water samples should be collected and analyzed for these metals.
 3. The RI report should note that cadmium and chromium concentrations in ground-water samples collected from wells 1035 and 1038 show an increasing level of contamination. In addition, the RI report should note that both mercury and nickel are present at increasing concentrations in well 1038.

Response:
Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.7
 Original Specific Comment #124

Commentor: Saric
 Pg. #: 4-35 Line #: NA

Code:

Comment: The text provides a summary of data generated from the SWL studies; however, it does not summarize data regarding the lateral and vertical extent of contamination related to the SWL. Subsurface soil and surface soil data indicates that considerable contamination and possibly waste exist beyond areas of known waste disposal. DOE should state clearly whether the lateral and vertical extent of contamination has been fully determined. The existing data indicates that this objective has not been achieved. If this is the case, DOE should identify this issue as a remaining data gap.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.7
 Original Specific Comment #125

Commentor: Saric
 Pg. #: 4-35 Line #: 28

Code:

Comment: The conclusion that uranium concentrations in native soils are much lower than those in the overlying fill is accurate but misleading. Concentrations of uranium in the native soils indicate that contaminants have migrated out of the waste materials and into the underlying soils. In addition, DOE has not explained the uranium contamination in borings 1035 and 49-06, which are outside the boundary of the SWL. DOE should clarify these issues.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.7
 Original Specific Comment #126

Commentor: Saric
 Pg. #: 4-35 Line #: 35

Code:

Comment: The RI report does not draw any conclusions concerning the level of contamination in the perched water table aquifer. As indicated in previous comments, DOE has not collected sufficient data (no samples from well 1037) to adequately characterize the nature and extent of ground-water contamination in the perched water table aquifer. DOE should identify this as a data gap and discuss possible resolution.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.7
 Original Specific Comment #127

Commentor: Saric
 Pg. #: 4-35 Line #: 35

Code:

Comment: Because the data validation of radionuclide data for the 2000-series wells in the SWL rejected all the data reviewed, no conclusions can be drawn concerning the radionuclide contamination present in the Great Miami Aquifer in the SWL area. DOE should validate all the data before revising the RI report, state whether data is acceptable or not, identify resulting data gaps, and resolve them.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.2.7
 Original Specific Comment #128

Commentor: Saric
 Pg. #: 4-35 Line #: 36-38 Code:

Comment: The text states that the near-background level of uranium in the Great Miami Aquifer wells closest to the SWL further indicates that contaminants have not migrated from the waste into the aquifer. DOE has sampled only the two wells

immediately downgradient (east) of the SWL to monitor the 200-foot-long downgradient perimeter of this waste area. These wells (2037 and 3037) are actually nested, monitoring two portions of the aquifer, and located at a single point. The lack of lateral and vertical coverage of the areas downgradient of the SWL makes DOE's conclusion premature at best. Furthermore, wells 2037 and 3037 have shown uranium concentrations of 5.0 µg/L and 35.0 µg/L, respectively; both results are significantly above the background concentration of 1.5 µg/L. DOE should provide further support for its conclusions or alter them accordingly.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.2.7, Table 4-9
Original Specific Comment #129

Commentor: Saric
Pg. #: 4-36 Line #: NA

Code:

Comment: Table 4-9 shows uranium, cesium, and strontium concentrations in biota in the SWL. If available, background concentrations should be provided for comparison.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.2.7
Original Specific Comment #130

Commentor: Saric
Pg. #: 4-37 Line #: 5

Code:

Comment: The RI report cannot support conclusions regarding the level of organic contamination in the perched water table aquifer because DOE analyzed only one sample for VOCs. This sample, drawn from well 1038, was analyzed for only five VOCs. DOE should further support its conclusion or note the limitations of the data and the uncertainty of its conclusion.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.3.3
Original Specific Comment #131

Commentor: Saric
Pg. #: 4-38 Line #: 31

Code:

Comment: The RI report states that 10 surface media samples were collected as part of the CIS from media surrounding the Lime Sludge Ponds. This statement is not entirely correct; nine samples were collected from the southern half of the South Lime Sludge Pond, and only one sample was collected north of the North Lime Sludge Pond. Those collected from the southern half were actually collected to support the K65 Silo Slurry Line investigation. The RI report should present the rationale for this sampling strategy and evaluate whether the coverage is sufficient.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.3.3
Original Specific Comment #132

Commentor: Saric
Pg. #: 4-40 Line #: 12

Code:

Comment: The text states that samples were collected from two RI/FS borings; however, the number of samples taken is not stated. DOE should clearly indicate here and in all applicable portions of the RI report precisely how many samples were collected and what they were analyzed for.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 4.3.3.1 Pg. #: 4-40 Line #: 20 Code:
 Original Specific Comment #133
 Comment: Data presented in the RI report is not sufficient to support a conclusion about the extent of surface soil contamination. The extent of surface soil contamination around the North Lime Sludge Pond has not been adequately investigated. This data gap was identified with the CIS data, but it was left unaddressed by the RI/FS. DOE should resolve this data gap.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Table 4-11 Pg. #: 4-42 Line #: NA Code:
 Original Specific Comment #134
 Comment: Table 4-11 inaccurately indicates that samples 23-012 and 23-012 were not collected within the boundary of the Lime Sludge Ponds. This discrepancy should be addressed.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 4.3.4.3 Pg. #: 4-50 Line #: NA Code:
 Original Specific Comment #135
 Comment: Table 4-16 indicates that mercury was detected twice in North Lime Sludge Pond subsurface media; however, the column containing detected ranges gives only one value. The table should provide the range of detections.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 4.3.5.1 Pg. #: 4-52 Line #: 16-23 Code:
 Original Specific Comment #136
 Comment: This section discusses radionuclides in ground water and states that elevated levels of uranium are likely attributable to upgradient sources. Such a determination is premature. DOE has noted elevated concentrations of uranium in the 1000-series wells adjacent to the Lime Sludge Ponds; these concentrations may or may not be attributable to the ponds themselves. However, the Great Miami Aquifer is not monitored at locations immediately downgradient of the Lime Sludge Ponds. Therefore, at the present time, no determination can be made regarding whether the ponds have affected the Great Miami Aquifer water quality. This issue should be identified in the RI report as a remaining data gap.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 4.3.5.1 Pg. #: 4-52 Line #: 20 Code:
 Original Specific Comment #137
 Comment: The RI report concludes that an upgradient source of radionuclide contamination is responsible for contamination in samples collected from well 1042. Well 1042 is directly downgradient from the Lime Sludge Ponds. Wells 1041 and 1039, which are upgradient from the Lime Sludge Ponds, have shown lower or nondetectable levels of radionuclide contamination during the same time period. This data suggests that the Lime Sludge Ponds are the source of ground-water contamination detected in well 1042. DOE should provide further justification for the conclusion that there is an upgradient source or appropriately alter its conclusion.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.5.2 Pg. #: 4-52 Line #: 25-29 Code:
Original Specific Comment #138

Comment: The text indicates that only two Great Miami Aquifer (2000-, 3000- or 4000-series wells) ground-water samples taken from the Lime Sludge Ponds area were analyzed for organic compounds. DOE should indicate in the RI report that the nature and extent of possible organic contamination in the Great Miami Aquifer in the Lime Sludge Ponds area remain a data gap.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.5.2 Pg. #: 4-52 Line #: 26 Code:
Original Specific Comment #139

Comment: The RI report cannot draw any conclusions about the nature or extent of organic contamination in the perched water table aquifer because no ground-water samples from the "1000-series" wells were analyzed for organic parameters. This data gap should be addressed.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.5.3 Pg. #: 4-52 Line #: 32-33 Code:
Original Specific Comment #140

Comment: This section discusses metals in ground-water samples collected from the Lime Sludge Ponds area and states that chromium was not consistently detected in any of the wells. The term "not consistently detected" is vague and should be more explicitly defined. Also, all ground-water metals data should be included in a table and discussed in the text.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.3 Pg. #: 4-57 Line #: 35 Code:
Original Specific Comment #141

Comment: The text states that five additional RI/FS borings were advanced in the Active Flyash Pile. Figure 2-11 indicates that six such borings were drilled. Boring 1725 was apparently omitted from the discussion. This discrepancy should be addressed.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.3 Pg. #: 4-60 Line #: 2 Code:
Original Specific Comment #142

Comment: The DOE OU 2 RI/FS work plan addendum, dated March 1991 and approved by U.S. EPA, indicates that samples from each boring would be analyzed by the Simulated Rainwater Leaching Procedure. However, the RI report does not indicate that these analyses were performed, and the analytical data is not presented. DOE should address this issue.

Response:

Action:

Commenting Organization: U.S. EPA
Section #: 4.4.3.3

Commentor: Saric
Pg. #: 4-66 Line #: 1-2

Code:

Original Specific Comment #143

Comment: The text states that arsenic concentrations in Active Flyash Pile native soils were lower than those in both the shallow and deep fill. This statement is misleading. The arsenic concentrations should be compared to established background levels.

Response:

Action:

Commenting Organization: U.S. EPA
Section #: 4.4.4.1

Commentor: Saric
Pg. #: 4-69 Line #: 7

Code:

Original Specific Comment #144

Comment: The RI report states that most of the surface drainage from the Active Flyash Pile flows into the storm water outfall ditch. However, DOE did not collect samples of surface water or sediment in the storm water outfall ditch to determine the impact of the Active Flyash Pile on this surface water body. DOE should address this data gap.

Response:

Action:

Commenting Organization: U.S. EPA
Section #: 4.4.4.1

Commentor: Saric
Pg. #: 4-69 Line #: 8

Code:

Original Specific Comment #145

Comment: Radionuclide contamination present in sediment samples is not completely characterized. Sediment samples were analyzed for only radium 226, radium 228, and total uranium. Analytical results for the Active Flyash Pile reveal the presence of other radionuclides that may contribute to the contamination present in the sediments. This limited data may result in underestimation of the risk in this area. This data gap should be addressed.

Response:

Action:

Commenting Organization: U.S. EPA
Section #: 4.4.4.1

Commentor: Saric
Pg. #: 4-69 Line #: 10

Code:

Original Specific Comment #146

Comment: Very high levels of radionuclides have been detected in surface water samples. However, DOE has not determined the source of the surface water contamination. This data gap should be addressed.

Response:

Action:

Commenting Organization: U.S. EPA
Section #: 4.4.4.2

Commentor: Saric
Pg. #: 4-69 Line #: 15-18

Code:

Original Specific Comment #147

Comment: This section should summarize the results of organic analyses of surface water samples.

Response:

Action:

Commenting Organization: U.S. EPA
Section #: 4.4.4.3

Commentor: Saric
Pg. #: 4-69 Line #: 20-23

Code:

Original Specific Comment #148

Comment: This section should summarize the results of metals analyses of sediment samples.
Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.4.4.3

Pg. #: 4-69 **Line #:** 19

Code:

Original Specific Comment #149

Comment: The RI report does not discuss the results of sediment sampling and analysis activities. Because above-background concentrations of several metals were detected in the flyash, surface soils, and sediment, the RI report should present this information. Results from sample ASIT-007 are probably not sufficient to characterize the level of metals contamination present in the sediment. Sample ASIT-007 had the lowest level of radionuclide contamination of the four sediment samples collected in this area. Because only the results for sample ASIT-007 were used, the estimation of risk may be biased low. DOE should collect additional samples to determine the extent of the SWL's impact on sediment in the intermittent stream.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.5.3

Pg. #: 4-76 **Line #:** 28

Code:

Original Specific Comment #150

Comment: The text lists seven additional RI/FS borings that were drilled in the Inactive Flyash Pile. However, data for boring 1850 is not presented in any figures or data tables, and the data is not summarized in text. This omission should be addressed.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.5.3.1

Pg. #: 4-82 **Line #:** NA

Code:

Original Specific Comment #151

Comment: Table 4-26 presents radionuclide data samples from RI/FS borings. Footnote "b" indicates that RI/FS total uranium values were estimated based on measured values of U-235 and U-238. Soil samples from borings 1791 and 4016 were not analyzed for the uranium isotopes; however, a total uranium value is still presented. This discrepancy should be explained.

Response:
Action:

Commenting Organization: U.S. EPA

Commentor: Saric

Section #: 4.5.4.1

Pg. #: 4-90 **Line #:** 9

Code:

Original Specific Comment #152

Comment: Surface water runoff flows from the Inactive Flyash Pile to the east; however, DOE did not sample surface water or sediment in this direction. This data gap should be addressed.

Response:
Action:

Commenting Organization: U.S. EPA
 Section #: 4.5.4.1
 Original Specific Comment #153

Commentor: Saric
 Pg. #: 4-90 Line #: 9

Code:

Comment: Surface water sampling location ASIT-009 receives surface water runoff from only a small portion of the Inactive Flyash Pile; therefore, this location is not adequate to support characterization of the level of surface water contamination. Surface water samples should have been collected from both upstream and downstream locations. In addition, samples were not analyzed for antimony, beryllium, or cyanide, which were consistently detected at levels above background in surface and subsurface media. This data gap should be addressed.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.5.4.2
 Original Specific Comment #154

Commentor: Saric
 Pg. #: 4-90 Line #: 13-14

Code:

Comment: The text states that no surface water or sediment samples from the Inactive Flyash Pile were analyzed for organic constituents. DOE should identify this issue as a remaining data gap.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.5.4.3
 Original Specific Comment #155

Commentor: Saric
 Pg. #: 4-90 Line #: 17-18

Code:

Comment: This section discusses metals in surface water and sediment in only one sentence. The text should include a more detailed discussion of the data, and the data should be summarized in data tables.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.5.4.3
 Original Specific Comment #156

Commentor: Saric
 Pg. #: 4-90 Line #: 17

Code:

Comment: No sediment samples were collected from the Inactive Flyash Pile area. Eight metals were detected at levels consistently above background in surface and subsurface media. Sediment samples should be collected to determine the extent of metals contamination.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.5.5.1
 Original Specific Comment #157

Commentor: Saric
 Pg. #: 4-90 Line #: 36

Code:

Comment: There is no well completion information in the appendix for well 2016. This information is required to assess the usability of the ground-water data. The appendix should include well completion information for well 2016.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.5.5.1
 Original Specific Comment #158

Commentor: Saric
 Pg. #: 4-90 Line #: 34

Code:

Comment: Only one well is screened in the perched water table aquifer in the Inactive Flyash Pile area. Therefore, it is not possible to characterize the ground-water flow system in this area or to determine the impact of the Inactive Flyash Pile on the ground-water quality in this area. The data gap should be addressed.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.5.5.1
 Original Specific Comment #159

Commentor: Saric
 Pg. #: 4-93 Line #: 3

Code:

Comment: Results presented in the RI report indicate very high levels of uranium contamination in well 2046. This well is over 300 feet downgradient of the Inactive Flyash Pile, and the RI report states that the source of the uranium contamination may be the Inactive Flyash Pile. This well was sampled in April 1990, and no further investigation is described in the RI report. This significant data gap should be addressed.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.5.5.2
 Original Specific Comment #160

Commentor: Saric
 Pg. #: 4-93 Line #: 12-15

Code:

Comment: This section summarizes organic ground-water data for the Inactive Flyash Pile. DOE has not identified the nature and extent of organic ground-water contamination associated with the Inactive Flyash Pile. DOE did not collect samples from any 2000-series wells to the east (downgradient) of the Inactive Flyash Pile for organic analyses. DOE should identify this issue as a remaining data gap and should collect the data necessary to determine the nature and extent of ground-water contamination.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.5.7
 Original Specific Comment #161

Commentor: Saric
 Pg. #: 4-93 Line #: 36

Code:

Comment: The RI report states that a definite conclusion cannot be drawn regarding the Inactive Flyash Pile as a measurable source of uranium in the ground water. This significant data gap should be addressed.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.6.3
 Original Specific Comment #162

Commentor: Saric
 Pg. #: 4-97 Line #: 21

Code:

Comment: The amount of surface water and sediment sampling conducted in the South Field is limited. At a minimum, both upstream and downstream surface water and sediment samples should have been collected. In particular, downstream samples should be collected in the South Field area along the east side of the Inactive Flyash Pile.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.6.3.1
 Original Specific Comment #163

Commentor: Saric
 Pg. #: 4-100 Line #: 1

Code:

Comment: The central portion (disposal areas) of the South Field has not been adequately sampled or characterized. The highest uranium concentration has been detected in this central portion (sample 24-081), and the CIS identified a large radionuclide-related anomaly during the surface screening investigation. However, during the CIS, only one surface soil sample was collected and only one borehole was installed in this area. None of the trenches excavated during the RI/FS is located in the central portion of the South Field. This lack of sampling in the central portion of the South Field represents a data gap that should be addressed.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.6.5
 Original Specific Comment #164

Commentor: Saric
 Pg. #: 4-128 Line #: 19

Code:

Comment: The RI report concludes that the perched water table aquifer system is present beneath the South Field, but that no evidence suggests that this system intersects the South Field. This conclusion is questionable because no wells that might provide such evidence are located within the boundary of the South Field. In addition, only one boring (boring 1793) appears to have been used to sample below the fill material at any significant depth. The hydrogeology beneath the South Field as presented in the RI report is mostly uncharacterized. DOE should identify this as a data gap and indicate how the data gap will be addressed.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.6.5.1
 Original Specific Comment #165

Commentor: Saric
 Pg. #: 4-128 Line #: 36

Code:

Comment: The RI report should state that uranium concentrations in well 1046 were above background concentrations for all sampling rounds.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.6.5.1
 Original Specific Comment #166

Commentor: Saric
 Pg. #: 4-128 Line #: 36

Code:

Comment: Although the RI report describes the contamination in wells 1516 and 1517, it does not discuss the potential source area for this contamination or its possible connection to the uranium contamination detected in well 2014. The RI report should discuss these items.

Response:
 Action:

Commenting Organization: U.S. EPA
 Section #: 4.6.5.1
 Original Specific Comment #167

Commentor: Saric
 Pg. #: 4-128 Line #: 36

Code:

Comment: The RI report inadequately characterizes the hydrogeology of the perched water table aquifer and does not address sampling of 1000-series wells in the South Field area. Adequate hydrogeological characterization and well sample analytical results are needed to define ground-water quality and to determine whether the South

Field is a potential source for contamination found in deeper aquifers. This data gap should be addressed.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.6.5.1
Original Specific Comment #168

Commentor: Saric
Pg. #: 4-140 Line #: 19

Code:

Comment: The RI report presents the hypothesis that Paddys Run may be a major source of uranium contamination for the 2000-series wells in the Great Miami Aquifer. Paddys Run may be contributing to the uranium contamination in the Great Miami Aquifer; however, the RI report should note that the two 2000-series wells downgradient from Paddys Run but upgradient from the South Field (wells 2047 and 2016) have consistently shown lower concentrations of uranium than most of the 2000-series wells downgradient from the South Field. This data seems to place the source area downgradient of Paddys Run and probably in the South Field. DOE should provide further support for its conclusion and provide direct evidence that the South Field is not a possible source.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.6.5.2
Original Specific Comment #169

Commentor: Saric
Pg. #: 4-140 Line #: 33

Code:

Comment: The RI report concludes that no waste-related metals were detected in any of the 1000-series wells in the South Field. While this is accurate, only samples from wells 1046 and 1048 analyzed for metals. Neither of these analyses was performed for antimony or beryllium, which were both detected at above-background concentrations in over half of the subsurface samples. Ground-water samples from wells 1516, 1517, and 1518 were not collected for metals analysis. These data gaps should be addressed.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 4.6.7
Original Specific Comment #170

Commentor: Saric
Pg. #: 4-142 Line #: 20

Code:

Comment: The RI report states that no conclusion can be drawn concerning the possibility that the South Field is the source of contamination in the Great Miami Aquifer. This data gap should be addressed.

Response:
Action:

Commenting Organization: U.S. EPA
Section #: 5.0
Original Specific Comment #171

Commentor: Saric
Pg. #: 5-1 Line #: 1

Code:

Comment: The fate and transport models used to predict future concentrations of contaminants in the Great Miami Aquifer are based on the assumption that OU 2 did not contribute to the contamination currently present in the Great Miami Aquifer. This assumption does not appear to be supported by the data presented in the RI report, especially the data for the South Field, the Active Flyash Pile, and the Inactive Flyash Pile areas. In these areas, modeling predicted that the maximum total uranium concentration in the future would be less than 10 $\mu\text{g/L}$. However, these areas appear to have contributed at least that level of contamination in a much shorter period of time. Therefore, the models do not

Section #: 6.2.1 Pg. #: 6-13 Line #: 24 Code:
 Original Specific Comment #176
 Comment: The text implies that all polynuclear aromatic hydrocarbons (PAH) for which no risk factors were available were assumed to have the same carcinogenic effects as benzo(a)pyrene. The report should clarify whether all PAHs were considered this way or only PAHs classified as B2 carcinogens were considered this way.
 Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 6.2.1 Pg. #: 6-14 Line #: 4 Code:
 Original Specific Comment #177
 Comment: The text states that the future land use scenario for a resident farmer does not necessarily reflect future realities. By definition, any assumptions regarding future land use do not necessarily reflect future realities. This statement should be deleted.
 Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 6.2.1 Pg. #: 6-14 Line #: 13 Code:
 Original Specific Comment #178
 Comment: The text states that ground-water risks are not discussed because risks from ground-water exposures were lower than risks from soil exposures. However, because ground water has a higher potential to migrate than soil, ground-water risks should also be discussed.
 Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 6.2.1 Pg. #: 6-17 Line #: 5 Code:
 Original Specific Comment #179
 Comment: The text introduces the use of ground-water screening levels. The source and exact use of these screening levels should be discussed in this section.
 Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: 6.2.4 Pg. #: 6-22 Line #: 28 Code:
 Original Specific Comment #180
 Comment: The text states that although Aroclor-1260, dichloroethene (DCE), and benzene were detected in the Active Flyash Pile, their presence is uncertain. Further discussion should be added to support this statement, or it should be removed from the report. Also, the report should indicate whether the compound identified as DCE is 1,1-DCE; 1,2-DCE; or total DCE.
 Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.1.1 Pg. #: A-1-2 Line #: 10 Code:
 Original Specific Comment #181
 Comment: The text indicates that landfill cells were covered with a layer of soil. If the average thickness of this layer of soil is known, it should be included in the report. If not, the report should state that the thickness is unknown.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.1 Pg. #: A-1-2 Line #: 15-22 Code:
Original Specific Comment #182
Comment: The text lists materials reportedly disposed of in the landfill. This section should be revised to include other wastes that may have been disposed of in the landfill based on general knowledge of past site operations.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.1.3 Pg. #: A-1-6 Line # 6 Code:
Original Specific Comment #183
Comment: The text states that the disposal area is located "each of and adjacent to" the south field. It appears that the word "each" should be replaced with the word "east."

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.1.3 Pg. #: A-1-6 Line #: 10-13 Code:
Original Specific Comment #184
Comment: The text contends that PCB- and uranium-contaminated oil may have been applied to the Active Flyash Pile to control dust. This section should discuss whether sampling data supports this contention.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.4 Pg. #: A-1-9 Line #: 3-5 Code:
Original Specific Comment #185
Comment: The text states that constituent concentrations from small sample populations fewer than seven samples are calculated as the 95 percent upper confidence limit (UCL) of the geometric mean. It is not clear why these small populations are assumed to be log normal. If insufficient data exists to determine a population's distribution, it would be more conservative to assume that the data is normally distributed and use the UCL of the arithmetic mean to represent constituent concentrations. Also, recent EPA guidance specifically states that using the geometric mean to estimate exposure point concentrations is not appropriate. All constituent concentrations should be expressed as the 95 percent UCL of the arithmetic mean.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.1.4 Pg. #: A-1-9 Line #: 6 Code:
Original Specific Comment #186
Comment: The text states that dermal contact models and parameters have been revised to reflect the most recent guidance from U.S. EPA. This section should reference the specific guidance documents or correspondence.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.1.4 Pg. #: A-1-9 Line #: 8 Code:
 Original Specific Comment #187
 Comment: The text states that slope factors are taken from the Health Effects Assessment Summary Tables (HEAST) Annual Report for fiscal year 1992. However, because (1) the Integrated Risk Information System (IRIS) is the primary source of risk factors and (2) HEAST often refers to IRIS as the source of risk factors, IRIS was probably the source of many slope factors used in the report. A reference to IRIS should be added to this section.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.2.1.1.1 Pg. #: A-2-3 Line #: 5 Code:
 Original Specific Comment #188
 Comment: The text states that several inorganic chemicals were not detected in background samples and that literature values for the Ohio and Indiana region were used to generate background UTLs. If any of these chemicals can be related to site activities, they should be included as CPCs if they are detected on site. Site-specific data should take precedence over regional literature data.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.2.1.2.2 Pg. #: A-2-8 Line #: 25-29 Code:
 Original Specific Comment #189
 Comment: The text presents an outlier test used to evaluate sample analytical data. However, no specific reference for the test is cited. The report should cite a reference for the outlier test. Also, the report should discuss the possibility that an identified outlier actually represents a "hot spot" area that should be further evaluated.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.2.2.2 Pg. #: A-2-23 Line #: NA Code:
 Original Specific Comment #190
 Comment: The table compares modeled ambient air concentrations of CPCs with Maximum Allowable Ground Level Concentrations (MAGLC). This comparison is not appropriate for eliminating chemicals as CPCs for the following reasons: (1) if the MAGLC values are prepared for occupational health considerations, the exposure assumptions will not accurately reflect the values for a resident receptor; and (2) using the beryllium concentration presented and a conservative inhalation exposure scenario results in a carcinogenic risk of 2×10^{-6} for an on-site receptor. Therefore, these criteria should not be used to exclude chemicals as CPCs. The conservative on-site inhalation scenario includes an air intake of 20 cubic meters per day (m^3/day), an exposure duration of 30 years, a body weight of 70 kg, and an average time of 70 years.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: A.2.2.3 Pg. #: A-2-44 Line #: 20 Code:
 Original Specific Comment #191

Comment: The text presents toxicity profiles for chemicals that are "prevalent throughout the waste area." Toxicity profiles should be presented for all CPCs at the site.

Response:

Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: A.2.2.3.1 **Pg. #:** A-2-25 **Line #:** 3-7 **Code:**
Original Specific Comment #192.
Comment: The text states that when surface soil sample size was insufficient to construct a UCL, subsurface soil data was substituted. This substitution may result in a significant underestimation of risk if concentrations of CPCs differ significantly between surface and subsurface soils. This may very likely be the case with windborne contaminants such as radionuclides. Therefore, when any surface soil data is available, maximum detected surface soil values should be used instead of subsurface soil values.

Response:

Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: A.2.2.3.2 **Pg. #:** A-2-27 **Line #:** 9 **Code:**
Original Specific Comment #193
Comment: The text states that results should not be confused with "what will actually occur." It is not possible at this time to accurately project what will actually occur. Therefore, this statement should be removed or reworded.

Response:

Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: A.2.2.3.3 **Pg. #:** A-2-27 **Line #:** 23-25 **Code:**
Original Specific Comment #194
Comment: The text states that modeling results indicate that OU 2 will not contribute above-background levels of radionuclides to surface water or sediment in Paddys Run. This observation is irrelevant to selecting CPCs or exposure pathways, especially if "background" concentrations do not truly represent uncontaminated conditions. Further justification for the omission of the surface water and sediment exposure pathway should be provided, or the pathway should be evaluated.

Response:

Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: A.3.2.2.1 **Pg. #:** A-3-21 **Line #:** 19-21 **Code:**
Original Specific Comment #195
Comment: The text states that soil boring data from the North and South Lime Sludge Ponds was combined based on the assumption that the same waste streams were placed in both ponds. However, this section should include a comparison of the sample analytical results for each pond to justify combining the data. If sample analytical results for the two ponds are significantly different, the data should not be combined.

Response:

Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: A.3.2.2.1 **Pg. #:** A-3-30 **Line #:** 17 **Code:**
Original Specific Comment #196

Comment: A value for the appropriate percentage of the total risk presented by U-238 via all pathways appears to have been omitted. The text should be revised to include the omitted value.

Response:
Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: A.3.3.1.1 **Pg. #:** A-3-34 **Line #:** 15-23 **Code:**
Original Specific Comment #197
Comment: The text compares analytical results for subsurface soil in the Active Flyash Pile to levels normally found in coal bottom ash or flyash. The purpose of this discussion within the risk assessment is unclear. The purpose of the discussion should be clarified, or the discussion should be moved to a more appropriate section of the RI report.

Response:
Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: A.3.4.1.1 **Pg. #:** A-3-48 **Line #:** 16-17 **Code:**
Original Specific Comment #198
Comment: The text states that at least one pocket of elevated concentrations is present in the Inactive Flyash Pile. The text should state whether elevated concentrations of chemicals or radionuclides other than U-238 were detected in the sample collected.

Response:
Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: A.3.4.1.1 **Pg. #:** A-3-48 **Line #:** 20-22 **Code:**
Original Specific Comment #199
Comment: The text states that concentrations of several CPCs are "several times background levels." It is not clear how this relates to the statistical comparison discussed earlier in the report. This relationship should be clarified, or the text should be deleted.

Response:
Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: A.3.5.2.2 **Pg. #:** A-3-70 **Line #:** 26 **Code:**
Original Specific Comment #200
Comment: The text states that PCBs, PAHs, and dioxins represent chemicals included with "extreme conservatism" in the toxicity assessment. Use of the word "extreme" implies a quantitative assessment of uncertainty that should be presented with other uncertainties (some of which may lead to an underestimation of risk) in the uncertainties section. The word "extreme" should be omitted.

Response:
Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: A.4.2.1.1 **Pg. #:** A-4-4 **Line #:** 1-3 **Code:**
Original Specific Comment #201
Comment: The discussion regarding uncertainties contributed by the CPC selection process is inadequate. The selection of CPCs is a major step in the risk assessment process and may profoundly contribute to uncertainty. This discussion should be revised

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-41 Line #: NA Code:
Original Specific Comment #207
Comment: In the equation used to compute the available quantity of adsorbed contaminant (Ss), the term "c" is not defined. Considering other terms in the equation, it seems that "c" should be "C," the cover factor. DOE should correct the typographical error, or the term "c" should be defined.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-41 Line #: NA Code:
Original Specific Comment #208
Comment: The equation used to compute Ss is dimensionally incorrect. Assuming "c" is actually "C," and inserting the provided units of other terms in the equation, the units of Ss are "g·hr-cm/ha," not "g" as indicated in the text. DOE should correct this discrepancy.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-41 Line #: 14 Code:
Original Specific Comment #209
Comment: The units of contaminated volume (A) presented as "hr-cm" do not appear to be correct. Considering other terms used to compute the available quantities of dissolved and adsorbed contaminants (Ms and Ss, respectively), the units of contaminated volume should be "ha-cm," where "ha" represents area in hectares. DOE should correct this discrepancy.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-41 Line #: NA Code:
Original Specific Comment #210
Comment: The equation used to compute Ms is dimensionally incorrect. Inserting the provided units of terms in the equation, the units of Ms are "g·hr-cm/ha," not "g" as indicated in the text. DOE should correct this discrepancy.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-41 Line #: 18 Code:
Original Specific Comment #211
Comment: In the equation used to compute the mass of adsorbed contaminants in the source area, term "Y(S)e" is not defined. If it is supposed to be "Y(S)_E," DOE should correct the typographical error. Otherwise, the term "Y(S)e" should be defined.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric

Section #: Appendix B Pg. #: B-41 Line #: 18 Code:
 Original Specific Comment #212
 Comment: The equation used to compute the mass of adsorbed contaminants in the source area (PXi) appears to be incorrect. If the term "Y(S)e" is assumed to be "Y(S)_E" and if some units are converted, the correct equation would be as follows:

$$PX_i = [100 \cdot Y(S)_E / \rho A] S_s$$

DOE should check and correct this equation if necessary.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix B Pg. #: B-41 Line #: 27 Code:
 Original Specific Comment #213
 Comment: In the equation used to compute the contaminant concentrations in the sediment of the receiving water body, the term "Y(S)e" should be "Y(S)_E." DOE should correct this typographical error.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix B Pg. #: B-41 Line #: 31 Code:
 Original Specific Comment #214
 Comment: The term "CS" should be "Cs." DOE should correct this typographical error.
 Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix B Pg. #: B-44 Line #: 12 Code:
 Original Specific Comment #215
 Comment: In the phrase "from source volumes," it appears that the term "volumes" should be replaced with the term "areas." DOE should check and correct the text, if necessary.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix B Pg. #: B-50 Line #: 1 and 2 Code:
 Original Specific Comment #216
 Comment: The text states that "although the velocities are relatively large, the contaminant flux may be small because the Darcy flux is small." If the contaminants are being transported through fractures in till, Darcy flux is not important. DOE should clarify the text to more fully explain this reasoning.

Response:
 Action:

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix B Pg. #: B-50 Line #: 11 Code:
 Original Specific Comment #217
 Comment: The text states that "the exact nature of the attenuation in fractured till is highly site specific." For a given site, the exact nature of attenuation is also event-specific. For a given fracture, attenuation depends on the ratio of the volume of

contaminated water flowing along the fracture surface to the total volume of contaminated water flowing through the fracture. Because this ratio varies from event to event, attenuation is event-specific in addition to being site-specific. The text should be revised to reflect this fact.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-50 Line #: 15 Code:
Original Specific Comment #218
Comment: The text states that "within the till deposits, there are numerous water-bearing zones that have limited interconnection." This statement is confusing, especially in light of the text preceding the statement, which emphasizes the highly fractured nature of the till. DOE should revise the text to explain how water-bearing deposits can have only limited connection if the till in which these deposits occur is highly fractured and deposits are numerous.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-52 Line #: 5 Code:
Original Specific Comment #219
Comment: The text states that the glacial overburden generally has "sufficient organic carbon content to cause retardation of organic constituents." DOE should provide the actual percentage of organic carbon in the glacial overburden.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-52 Line #: 8 Code:
Original Specific Comment #220
Comment: The text states that "it is unlikely that adsorption/attenuation breakthrough would occur." This statement should be supported by relevant quantitative information such as the organic carbon content and thickness of the till. DOE should support such qualitative statements with relevant data from the site and available literature.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-52 Line #: 37, 38 Code:
Original Specific Comment #221
Comment: The text states that conceptual models were used to simulate ground-water flow. This statement appears to be inaccurate because only one model was used to simulate ground-water flow at the site. DOE should check and correct this statement, if necessary.

Response:
Action:

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-58 Line #: 14 Code:
Original Specific Comment #222
Comment: The text refers to "Table B.3-7." The reference should be to Table B.3-2.
Response:

Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: Appendix B **Pg. #:** B-79 **Line #:** 25 **Code:**
Original Specific Comment #223
Comment: The text reading "values were be used" should be revised to read "values will be used."

Response:
Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: Appendix B **Pg. #:** B-82 **Line #:** 23 **Code:**
Original Specific Comment #224
Comment: The text should define the term "normalized concentration."
Response:
Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: Appendix B **Pg. #:** B-97 **Line #:** 10 **Code:**
Original Specific Comment #225
Comment: DOE should provide examples of the constituents referred to in the statement.
"peak concentrations of some constituents . . . can be expected to be quite low."
The range of the expected low concentrations should also be provided.

Response:
Action:

Commenting Organization: U.S. EPA **Commentor:** Saric
Section #: Appendix B **Pg. #:** B-157 **Line #:** 18 **Code:**
Original Specific Comment #226
Comment: The phrase "of the contaminant plume" should be revised to read "of the concentrations in the contaminant plume."

Response:
Action: