U-004-306.20

4106

RESPONSES TO U.S. EPA AND OHIO EPA TECHNICAL COMMENTS ON THE DRAFT OU2 REMEDIAL INVESTIGATION REPORT FEBRUARY 1993

02/05/92

DOE-FN/EPA
150
RESPONSES

RESPONSES TO

U.S. EPA AND OHIO EPA

TECHNICAL COMMENTS

ON THE

DRAFT OU 2 REMEDIAL INVESTIGATION REPORT

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FERNALD, OHIO

FEBRUARY 1993

U. S. DEPARTMENT OF ENERGY

FERNALD FIELD OFFICE

RESPONSES TO
U.S. EPA AND OHIO EPA
TECHNICAL COMMENTS
ON THE
DRAFT OU 2 REMEDIAL INVESTIGATION REPORT

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FERNALD, OHIO

FEBRUARY 1993

U. S. DEPARTMENT OF ENERGY

FERNALD FIELD OFFICE

TABLE OF CONTENTS

RESPONSES TO U. S. EPA AND OHIO EPA TECHNICAL COMMENTS ON THE DRAFT OU 2 REMEDIAL INVESTIGATION REPORT

	Comment/ Response No.	Page No.
A. U.S. EPA COMMENTS/DOE RESPONSES		
1. General Comments/Responses		
a. General Comments #1-21 (Commentor: Saric)	1-21	1
b. Additional Comments #ADD1-5 (Commentor: Saric)	22-26	12
2. Specific Comments/Responses		
a. Specific Comments # 1-226 (Commentor: Saric)	27-252	14
b. Specific Comments #(1-31) (Commentor: Van Leeuwan)	253-283	95
c. Specific Comments #1-44 (Commentors: Jablonski et al)	284-327	106
B. OHIO EPA COMMENTS/DOE RESPONSES		
1. General Comment - #1-4 (Commentor: Ohio EPA)	328-331	120
2. Specific Comments - #1-119 (Commentors: Ohio EPA and GeoTrans)	332-450	122
Attachments		

A. U.S. EPA COMMENTS/DOE RESPONSES

1. General Comments/Responses

a. General Comments # 1-21 (Commentor: Saric)

1. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4 Pg. #: NA Line #: NA Code: M
Original General Comment #1
Comment: Each of the summary sections in Section 4 of the remedial investigation (RI) report indicates that the data collected to date in the operable unit (OU) 2 areas is inconclusive and cannot be used to determine whether OU 2 is the source of the contamination. The RI report should identify each specific data gap and should present recommendations for addressing the data gaps.

Response: **The approach for conducting the revised RI will accommodate the DOE proposed strategy for developing a Group 1 Interim ROD and a Group 2 ROD. Group 1 would consist of the above-grade flyash component of the Active Flyash Pile and the Lime Sludge Ponds. Group 2 would consist of the below-grade component of the Active Flyash Pile, the Inactive Flyash Pile, the South Field, and the Solid Waste Landfill. This strategy recognizes that selection of a remedy for Group 1 subunits requires significantly less field data. An Interim ROD can be developed for these units without additional field investigation, although additional characterization may be required to support the development of the OU 2 baseline risk assessment in the Group 2 ROD. Development of a ROD for Group 2 will require supplemental characterization and subsequently a longer project duration, therefore a Phase II RI will be required for remedy selection and development of the ROD.**

It should be noted that in the remainder of this document, responses pertaining to the Active Flyash Pile and the Lime Sludge Ponds reference additional field data collection activities. These activties are proposed mainly to support the risk assessment to specify the final acceptable exposure levels for the Group 2 ROD.

Action: **The OU 2 RI specific data gaps will be identified and addressed in the OU 2 Phase II RI Project Specific Plan (PSP).**

2. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.2 Pg. #: NA Line #: NA Code:
Original General Comment #2
Comment: The text states that if an analyte exceeds background concentrations in ground water but not in the overlying soils, it is assumed that the source of this constituent is not OU 2. This assumption will prove valid only if the overlying soils (and waste) have been thoroughly and completely characterized with respect to the nature of contamination and if usable, validated data exists for all compounds known or suspected to be present at a specific waste area. As noted in the following comments,

this is not the case because many data gaps remain. Therefore, this screening method is not appropriate for many constituents. The RI report will need to be revised accordingly.

Response: **Agreed. A Phase II RI is planned to address data gaps.**

Action: **Additional sampling and analysis is planned for the overlying soils and waste to characterize the nature and extent of contamination. The Phase II RI will provide validated data for all compounds known or suspected to be present at the specific waste units. The scope of the sampling and analysis program will be presented in the OU 2 Phase II RI PSP.**

3. Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original General Comment #3
Comment: Each section that discusses hydrogeology and ground-water flow briefly summarizes the data collected to date but does not interpret or describe the flow system for each disposal unit. The RI report should describe the flow systems by defining ground-water flow directions and rates and by presenting potentiometric maps for each of the aquifer systems in each area investigated.

Response: **Agreed.**

Action: **The revised (Phase II) RI Report will provide a description and interpretation of the flow system for each disposal unit including defining ground-water flow directions and rates, if possible, and by presenting potentiometric maps.**

4. Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original General Comment #4
Comment: Many media in each OU 2 study area are incompletely characterized. For example, sediment samples in the Active Flyash Pile area were analyzed for only radium 226, radium 228, and total uranium. Several other radionuclides have a high probability of being present in the sediments. Incomplete characterization results in underestimating the total risk to receptors. This data gap may result in unsupportable conclusions for the source terms used in risk characterization and inadequate definition of the nature and extent of contamination. The U.S. Department of Energy (DOE) should adequately characterize the nature and extent of contamination for all constituents; this may require additional investigation of OU 2.

Response: **See Comment/Response No. 1. Agreed. DOE is planning to perform a Phase II RI to adequately characterize the nature and extent of contamination and to evaluate risks.**

Action: **The OU 2 RI specific data gaps will be identified and addressed in the OU 2 Phase II RI PSP.**

5. Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original General Comment #5
Comment: Most data presented in the RI report has not been validated, which leads to considerable uncertainty regarding the conclusions that describe the nature and extent of contamination as well as the risk assessment. In addition, the RI report describes the data validation process, which erroneously leads the reader to believe that all the data has been validated. However, the remedial investigation and feasibility study (RI/FS) and Characterization Investigation Study (CIS) data tables in the appendices have footnotes indicating that the data has not been validated. DOE should ensure that all data is validated. The report should be revised to include a discussion of data usability. If data validation indicates that there are data gaps, the data gaps should be addressed.

Response: **All data related to OU 2 is being reviewed as part of the scoping of the Phase II RI to determine validation status and usability. At the time the draft OU 2 RI was submitted validation of the CIS data and some of the RI data was incomplete. The chemical CIS chemical data validation has subsequently been completed, and the validation qualifiers will be added to the data base. These data will continue to be used to supplement the RI data. The CIS radiological data were not validated at the time the RI Report was prepared. On a preliminary basis it has been recently determined that adequate documentation for validation of the CIS radiological is not available. Pending further evaluation these data will only be used to help define the nature and extent of contamination and not to quantify risk. All OU 2 RI/FS data has been validated as of this point and the validation qualifiers will be added to the database.**

Action: **The OU 2 Phase II PSP will provide the results of the data evaluation. The Phase II RI will fully discuss the data validation process and the usability of all OU 2 related data and data gaps.**

6. Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original General Comment #6
Comment: There are many data gaps in the RI report with regard to determining the sources and the extent of contamination. These data gaps are the result of not collecting samples from critical areas or not analyzing samples for critical parameters. Examples of these deficiencies fall into two categories. The first category is where DOE collected and analyzed samples in accordance with the approved work plan but data gaps still exist and should be addressed. An example is the lack of surface water and sediment sampling around the active and inactive flyash piles. The second category is where DOE reviewed the existing data from previous studies and erroneously determined that the data was adequate to meet the objectives. Review of the data presented in the RI identified data gaps in the previous studies that should have been addressed in the RI. An example is the lack of subsurface characterization and sampling in the disposal areas of the South Field. Several additional examples are provided in the following

general and specific comments. To adequately assess risk and to evaluate or implement remedial action, data gaps will have to be corrected by collecting additional data.

Response: **It is agreed that additional data is required to adequately assess risk and to evaluate or implement remedial action, although interim actions can be implemented at some units using the available data. To provide the necessary data a Phase II RI is planned.**

Action: **A considerable amount of data has been collected during the previous investigations. Data presentation and analysis is complicated by the data volume, different analytical procedures, varying data quality, and by the complexity of the waste units. To assist in interpreting the data for purposes of scoping the Phase II RI computer based solid block models of the OU 2 waste units will be prepared. Using this tool all usable OU 2 chemical, radiological, and physical data can be analyzed to determine data gaps that will be addressed by the Phase II RI. Results of the solid block modeling analysis will be presented in the Phase II RI PSP.**

7. Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original General Comment #7
Comment: The RI report states that many of the volatile organic compound (VOC) analyses of the Active and Inactive Flyash Pile were rejected due to matrix interference problems and that this does not represent a significant data limitation. Review of the data indicates that only 2 of 13 samples provide usable data from the flyash material. The rest of the VOC analyses of the flyash material were rejected. The matrix interference is usually caused by other organic compounds present at high concentrations. In the case of the flyash piles, it was reported that oil was sprayed 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: **See Comment/Response No. 1. The data validation process rejected some VOCs in the RI/FS flyash data set due to deficiencies attributable to matrix interference. The matrix effect is suspected to be a result of the internal standards having a high affinity for carbon in the flyash. The matrix effect was not reported for samples of the native soil taken at depth. A review of the TICs may be useful if identification is possible (see Comment/Response No. 8).**

Action: **A modification of the analytical method to analyze VOCs in flyash is being investigated during scoping of the Phase II RI. The TIC information will also be reviewed.**

8. 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: **Typically TIC data for this method is reported for the ten nontarget compounds of largest apparent concentration in each fraction, excluding PCBs/pesticides. Tentative identification of these compounds may not be possible. For the EPA analytical method referenced, the TIC information is reported with the target compound results.**

Action: **Appendix A of the revised (Phase II) RI Report will include a table to provide TIC information (concentrations and number and types of compounds) for every sample (provided the TIC data is recovered). Significant concentrations of TICs will be discussed relative to risk assessment.**

9. 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: **DOE agrees that outliers in background data can skew the tolerance limits. Therefore, outliers are eliminated from background data sets. On the other hand, the outlier discussion is not appropriate when on-site data are being evaluated.**

Action: **Outliers will be eliminated from the background data sets prior to comparison with on-site upper confidence limits (UCL) concentrations. The UCL**

concentrations of contaminants on site will be calculated using all data points, and all discussion of outliers in on-site samples will be omitted from the revised (Phase II) RI Report.

The text that discusses the selection of CPCs will be modified to eliminate the effects of the automated selection process previously used. Given the limited knowledge of some onsite activities, it may not be possible to determine whether isolated occurrences of chemical contaminants result from past site activity, therefore DOE does not propose to include those chemicals that fail the statistical test unless there is strong evidence to the contrary.

Finally, the term CPC will be substituted for COC, however, in deference to G. Jablonowski's comments (see Comment/Response No. 311), it will stand for "contaminant of potential concern".

10. 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: **Agreed.**

Action: **Quantitative statements will be inserted where required to clarify the report, and editorial qualifiers removed. Also, the risks will be totalled across receptors. Since risks are generally not separated for inorganics and organics, these risks will be summed, and will be presented separately from the total radionuclide risks in the revised (Phase II) RI Report.**

11. 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: **DOE believes that the presentation of proportional risks by exposure route will lend little to the final conclusions of the risk assessment, unless one or two routes of exposure consistently present the majority of the risks.**

DOE agrees that RAGS calls for risks to be presented to only one significant figure, although typically, two have been used.

Action: **Discussion of risks attributable to particular exposure routes will be discussed in the text if a limited number present the majority of the risk. Otherwise, this issue will not be addressed. DOE will to present carcinogenic risks to one significant figure.**

12. 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: **DOE agrees in principle with this comment, with the exception of the additional exposure routes proposed for trespassers. Given the short duration of exposure and the limited amount of fruits and vegetables available at the site throughout the year, these exposures would be minimal.**

Action: **The soil ingestion scenario will be modified to incorporate 6 of 70 years as a child with higher ingestion rates. However, separate risk numbers will not be presented. The risks associated with the future resident are already unacceptable**

in most instances and this task would add no material value to the conclusions of the assessment. Inhalation of volatile emissions and dermal contact during showering/bathing will be added for residential receptors. No additional exposure routes will be evaluated for trespassers.

13. 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: **Agreed.**

Action: **The uncertainties discussion will be presented in a separate Uncertainties Section of the revised (Phase II) RI Report. This section will include a discussion of the uncertainty associated with the present data set gaps as well as or other uncertainties identified in the assessment process. since a supplemental data collection program is planned to define nature and extent of contamination, the uncertainties associated with the present lack of definition will be mitigated.**

14. 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: **Agreed.**

Action: **The revised (Phase II) Report will be modified as requested.**

15. 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: **Since there is no guidance as to what the central tendency is, it may be more appropriate to use the terminology of "typical average". However, should additional guidance become available from the agency, "central tendency" would be more appropriate.**

Action: **The term selected for use in the report will be defined and, thereafter, used consistently.**

16. 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.

Response: **Agreed.**

Action: **The risk assessment will incorporate additional surface soil data that will be acquired during the Phase II field investigation program.**

17. 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: **In the interest of brevity, section 6 of the RI was intended to provide supplemental information on only "major" contaminants. However, DOE agrees that the risk discussions in the appendix could include additional chemicals as appropriate.**

Action: **The risk assessment appendix will be modified to include discussions of multiple "significant" contaminants as required.**

18. 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: **Agreed.**

Action: **The modified modeling procedures will be presented in the Phase II RI PSP. Depending on the final risk assessment approach, the groundwater fate and transport modeling procedure will be modified to support the needs of lower screening levels for individual contaminant and accumulated effects from all the contaminants and waste areas. Issues regarding the appropriate modeling protocol and procedures used in the air transport analysis are still pending. Appendix B of the revised (Phase II) RI Report will reflect the modified procedures.**

19. 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: **DOE makes this statement because many of the OU 2 waste areas have vegetative cover and as a result the concentrations calculated in the draft RI Report are conservatively high and represent a worst case scenario for resuspension. Calibration of the dispersion model is not possible because, field data is not provided for some of the waste sites. Representative resuspension emission rates can be calculated using other procedures given in the reference document <u>Control of Open Fugitive Dust Sources (Cowherd, Muleski and Kinsey, EPA 1988)</u> which addresses vegetative cover.**

Action: **The procedure for handling vegetative cover in air modeling applications will be addressed in the OU 2 Phase II RI PSP.**

20. 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: **Agreed. Some of the references are either not included in the list of references or are incorrectly referenced.**

Action: **All references cited in the revised (Phase II) RI Report will be clearly indicated within the text and List of References.**

21. Commenting Organization: U.S. EPA
Commentor: Saric
Section #: Appendix B Pg. #: NA Line #: NA Code:
Original Comment #21
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: **Agreed. DOE has conducted a review of the air transport analysis and the cited deficiencies. Based on this review, it appears that the air transport results given in Appendix B of the draft RI may be incorrect.**

Action: **The air transport analysis will be revised as part of the Phase II RI to address these deficiencies.**

b. **Additional Comments #ADD1-5 (Commentor: Saric)**

22. **Commenting Organization: U.S. EPA Commentor: Saric**
Section #: NA Pg. #: NA Line #: NA Code:
Original Comment # ADD1
Comment: The OU 2RI and risk assessment for future use risk scenarios is based on the fate and transport modelling presented in Section 5 of the RI report. The fate and transport modelling assumes that there is no current OU 2 source of contamination impacting the Great Miami aquifer. The data presented in the RI does not support this assumption. For example, ground-water samples from many 2000 series wells in the South Field study area have detected uranium contamination above background levels and DOE has not determined the source of contamination. The lack of characterization and lack of confirming source areas has far reaching implications into the accuracy of the fate and transport modeling and the resultant future use risks presented in the base line risk assessment. Additional field characterization and source identification must be conducted to validate the conclusions of the fate and transport modeling and support the conclusions in the risk assessment.

Response: Agreed.

Action: **The OU 2 Phase II RI will include a hydrogeologic investigation to determine if the OU 2 waste units are presently a source or potentially a future source of groundwater contamination. This investigation will involve installation of additional monitoring wells in the perched zones and the shallow aquifer. The conclusion regarding the OU 2 waste units impacts on the groundwater will be evaluated by modeling with corrected source loading rates (see Comment/Response No. 197). Calibration of the transport model with measured contaminant concentrations around the OU 2 waste units will be conducted. The risk assessment will be revised accordingly. The results will be reported in the revised (Phase II) RI Report.**

23. Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original Comment # ADD2
Comment: The data presented in the RI does not characterize the source areas. A fundamental assumption in characterizing contamination in OU 2 is that any contaminant detected in a "nonsource area" sample but are below background concentration in the defined source area are assumed not to have originated in the defined source area. This is a reasonable approach if the defined source area is adequately characterized. However, DOE has not presented data in the RI which adequately characterized the source areas. At a minimum, DOE should provide a table for each OU 2 study area of the contaminants detected but omitted from discussion. In addition, to this table DOE should provide recommendations of how and where this contamination will be addressed.

Response: **Agreed.**

Action: **The Phase II RI will provide additional data to adequately characterize the source areas. The scope of the sampling and analysis program will be presented in the OU 2 Phase II RI PSP.**

24. Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original Comment # ADD3
Comment: Several of the areas of contamination in the OU 2 RI were partially characterized by data collected in the RI/FS but left data gaps which should have been addressed by subsequent sampling efforts. Examples include (1) antimony and beryllium detected in over half the subsurface samples above background levels and not analyzed for in surface water, sediment, or ground water samples near the inactive flyash pile; (2) uranium and VOC contamination identified in the Great Miami aquifer east of the inactive flyash pile; additional wells should have been installed to determine if the source of the contamination is the in active flyash pile or another source. DOE should address these data gaps.

Response: **See Comment/Response No. 1. Agreed.**

Action: **The data gap examples cited above will be addressed by the OU 2 Phase II RI; details of the field investigation will be provided in the PSP.**

25. 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.

Response: **See Comment/Response No. 1. Agreed.**

Action: **Installation of additional monitoring wells and sampling of existing monitoring wells is planned under the OU 2 Phase II RI to determine the impact of the waste units on perched water and the shallow aquifer. Details of the proposed sampling and analysis program will be presented in the Phase II RI PSP.**

26. Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Pg. #: NA Line #: NA Code:
Original Comment # ADD5
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.

Response: **Agreed. Additional information regarding the source terms for the Inactive Flyash Pile and the South Field areas will be available for the fate and transport modeling and risk assessment calculations for revised (Phase II) RI Report.**

Action: **See action for Comment/Response No. 22.**

2. Specific Comments/Responses

a. **Specific Comments #1-226 (Comentor: Saric)**

27. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.1.1 Pg. #: 1-4 Line #: 13-14 Code:
Original Specific Comment #1

Comment: The text states that the work plan and sampling plan were developed before the OUs were formulated and that no specific OU plans guided the RI activities. The text should clearly reference all applicable work plans, work plan addenda, and sampling plans under which OU 2 RI activities were performed so that the RI activities performed can be evaluated against the work proposed.

Response: **Agreed. Applicable work plans, work plan addenda, and sampling plans under which OU 2 RI activities were performed are being assembled as part of the Phase II RI planning process.**

Action: **The work plans, work plan addenda, and sampling plans under which OU 2 RI activities were performed will be referenced in the revised (Phase II) RI Report.**

28. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.1.1 Pg. #: 1-6 Line #: 17 Code:
Original Specific Comment #2

Comment: The RI report states that the criteria for selecting a remedial alternative include effectiveness, implementability, and cost. The RI report should also state that the selection criteria must include overall protectiveness of human health and the environment; compliance with applicable or relevant and appropriate requirements (ARAR); long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; and state and community acceptance.

Response: **Agreed.**

Action: **The remedy selection criteria will be provided in the revised (Phase II) RI Report.**

29. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.3.1.1 Pg. #: 1-14 Line #: 37-38 Code:
Original Specific Comment #3

Comment: The text states that the evaporation pond was used to collect storm water runoff. The text should clearly indicate the areas that the storm water runoff originated from.

Response: **Agreed. A review of OU 2 related historical records and information is being conducted as part of the Phase II RI planning. Further interviews with operations personnel and analysis of historical photographs are also being performed. The source areas for runoff in the evaporation pond is a topic of this research. The intended function of the evaporation pond was to collect drainage from the area where waste was being dumped. In 1974, a ditch was installed along the east side of the pond to divert surface runoff away from the pond.**

Action: **The text of the revised (Phase II) RI Report will be revised accordingly.**

30. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.3.1.1 Pg. #: 1-16 Line #: 3 Code:
Original Specific Comment #4
Comment: The RI report does not accurately describe the contents of the Solid Waste Landfill (SWL). Trenching activities completed in fall 1992 identified "yellow cake-like" material. More recent data from the trenching activities should be discussed in the revised RI report.

Response: **Agreed. Results of the trenching activities were unavailable at the time the draft RI Report was prepared.**

Action: **DOE will consider the SWL trenching results in the development of the Phase II RI Project Specific Plan and report the results in the revised (Phase II) RI Report.**

31. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.3.3.2 Pg. #: 1-21 Line #: 29-30 Code:
Original Specific Comment #5
Comment: The text states that surveying for additional hot spots in the South Field area was completed on June 30, 1992. However, the text does not state whether this data will be included in the revised RI report. The report should describe the ongoing data gathering activities, and available data should be included in the revised RI report. If this data is not intended for use in the RI report, the intended use of the data should be discussed.

Response: **Agreed.**

Action: **The radiological survey data referenced will be reviewed in the development of the Phase II RI PSP and will be incorporated into the revised (Phase II) RI Report to the extent useable.**

32. 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: **Agreed. Information detailing the work plan requirements and the justification for deviation is available.**

Action: **The work plan references and deviation information will be incorporated into the revised (Phase II) RI Report.**

33. 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: **Since the FEMP Work Plan, the Sampling Plan, and the Quality Assurance Project Plan of March 1988 were approved by EPA Region V, it is DOE's understanding that the Quality Assurance Section of EPA Region V would have reviewed those planning documents.**

Action: **DOE will coordinate with EPA Region V to assure that this review will take place for future documents.**

34. 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: **Agreed.**

Action: **Table 2-1 will be revised to accurately reflect all analytical methods used during the various studies.**

35. 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: **See Comment/Response No. 1. Agreed.**

All of the CIS subsurface soil samples collected for chemical analyses were composited across the length of the boring. The samples collected for VOC analyses were composited in the laboratory, while the samples collected for the other analyses were composited in the field. During the preparation of the RI Report, these data were used only if compounds detected in the CIS samples were not found in the RI samples.

Action: **The text will be rewritten to clarify that all of the subsurface soil samples collected during the CIS for chemical analyses were composited across the length of the boreholes. In addition, the text will be revised to include a discussion of how the data was used in the preparation of the RI report.**

The collection of additional samples is planned for the flyash piles during the Phase II RI to supplement the VOC data collected during the CIS and the RI.

36. 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: **Agreed.**

According to Section 2.1.2 of the CIS Report, "Radiological Survey of Surface Soils", measurements were made with the FIDLER at 50-ft grid intersections (FIDLER grid measurements). Following these measurements, the 50-ft grid blocks were subdivided into four quarters, each 25 ft by 25 ft. These subdivided blocks were scanned for anomalous radioactivity concentrations (FIDLER scan measurements).

These FIDLER scan measurements were taken by setting an Eberline Model PRS-1 ratemeter/scaler coupled to the FIDLER to integrate FIDLER counts for a 1-minute counting period. The field technicians were trained to walk and scan a 25-ft subdivided grid in that time. The scans started in one corner of the grid block and progressed in a serpentine pattern over the entire area. The technician recorded each integrated count on the FIDLER scan measurement logbook form. The PRS-1 output is an audible tone which indicates higher activity. When a grid block having an increased audible signal was detected, a mark was made on the FIDLER scan measurement logbook form to indicate the probable presence of a hot spot somewhere in that grid block.

When subgrid blocks having anomalies were noted, they were subdivided into 6.25-ft interval grids and measurements were taken on that grid with the FIDLER (FIDLER on-surface measurements).

Action: **The revised (Phase II) RI Report will include the above information.**

37. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.1.3.1 Pg. #: 2-10 Line #: 12-22 Code:
Original Specific Comment #11

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: **Direct leaching of contaminants from surface soil outside the waste units to the Great Miami Aquifer is not considered significant when compared to the potential impact of subsurface contamination in the waste units.**

Action: **Phase II RI fate and transport modeling of the contaminants detected in the surface soil will include air dispersion and surface runoff pathways. Impacts on the water and sediment in Paddy's Run, and subsequent loading from Paddy's Run into the Great Miami Aquifer will be included.**

38. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.1.2.1 Pg. #: 2-10 Line #: 15 Code:
Original Specific Comment #12

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: **Agreed.**

Action: **Additional surface soil sampling and analysis is being planned under the OU 2 Phase II RI to address this data gap. The samples collected will be analyzed for both radiochemical and chemical parameters. The specifics of the additional samples will be provided in the OU 2 Phase II RI PSP.**

39. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.1.3.2 Pg. #: 2-11 Line #: 38 Code:
Original Specific Comment #13

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: **Agreed.**

Action: **The text will be revised to indicate that the clay layer dividing the upper and lower portions of the Great Miami Aquifer is a transgressive unit present in the northern portion of the site and absent in the southern and eastern sections of the site.**

40. 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: **See Comment/Response No. 1. Agreed.**

Three wells in the South Field area, two wells in the Inactive Flyash Pile area, two wells in the Lime Sludge Pond area, and three wells in the Solid Waste Landfill area were sampled and analyzed for the organic portion of the FEMP RI/FS Hazardous Substance List (HSL). With the exception of several wells at the Solid Waste Landfill (1038, 2027, 2037, 2052, 3037), these wells were sampled and analyzed only once for the organic portion of the FEMP RI/FS HSL. However, multiple rounds of samples for the inorganic portion of the FEMP RI/FS HSL have been analyzed.

Action: **Additional groundwater sampling and analysis for the organic portion of the FEMP RI/FS HSL are being proposed under the Phase II RI. Some samples may also be analyzed for the inorganic portion of the FEMP RI/FS HSL. Additional wells may also be added in areas where data gaps have been identified.**

41. 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: **Agreed.**

Action: **The text will be revised to more clearly indicate the process used to validate the data. The text will define the difference between the laboratory's data evaluation and the independent data validation. The peer review of the data validation will also be described.**

42. 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: **Agreed. The chemical data generated during the CIS for the subsurface borings were not validated at the time the RI Report was prepared. This data was used only to supplement the RI data by identifying compounds detected in the CIS samples, but not in the RI samples. Compounds meeting the criteria were then included as chemicals of concern. The CIS chemical data has subsequently been validated and the validation qualifiers will be added to the data. This data will continue to be used to supplement the RI data.**

The radiologic data generated during the CIS were not validated at the time the RI Report was prepared. Recently it has been determined on a preliminary basis that the CIS radionuclide data for OU 2 could not be validated for use in quantitative risk assessment. Pending the outcome of further evaluation, this data will only be used to help define the nature and extent of contamination.

Section 3.0 of the final Risk Assessment Work Plan Addendum states that, "Existing databases generated by WEMCO and its subcontractors in routine environmental monitoring and in the Characterization Investigation Study (CIS) (Weston 1987) will be considered as secondary sources because the QA/QC procedures on these data are not as well documented. ... Secondary sources will only be used when primary

sources do not contain the data sought. If a secondary data source is used, the source of the data will be clearly identified."

Action: **The report will be revised to indicate that the use of CIS chemical data as a secondary source is supported by the final Risk Assessment Work Plan Addendum.**

43. 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: **Agreed.**

Action: **See action to Comment/Response No. 41.**

44. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.1.4.3 Pg. #: 2-28 Line #: 27 Code:
Original Specific Comment #18
Comment: The RI/FS QAPjP, dated March 1988, does not contain procedures for data validation. DOE should clarify how the data validation was conducted.

Response: **Agreed.**

Action: **See action to Comment/Response No. 41. The text will also be revised to clarify the validation process used to validate the radiological data.**

45. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.1.4.4 Pg. #: 2-30 Line #: 7 Code:
Original Specific Comment #19
Comment: The text gives the acceptance ratio for the ratio of uranium 234 (U-234) to U-238 as about 1 percent. However, these two isotopes should be in secular equilibrium, as described in Section 5.2.1, with a ratio of about unity. DOE should correct the text.

Response: **Agreed.**

Action: **The text will be corrected to clarify the U-234 and U-238 ratios.**

46. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.1.4.4 Pg. #: 2-30 Line #: 10-11 Code:
Original Specific Comment #20
Comment: This line states that data was flagged as unusable if holding times were grossly exceeded or where severe QC deficiencies were observed. The terms "grossly" and "severe QC deficiencies" should be specifically defined. The discussion suggests that data was rejected solely on a nonquantitative basis. DOE should more clearly describe the data validation procedures.

Response: **Agreed.**

Action: **See Comment/Response No. 41.**

47. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2 Pg. #: 2-30 Line #: 18-19 Code:
Original Specific Comment #21
Comment: The text states that the evaporation pond and the landfill cells have been covered with on-site soils. The on-site source of this cover material should be identified, and the text should discuss whether the cover material is contaminated as a result of site-related activities. The thickness of the cover layers should also be provided.

Response: **According to a long-time employee of the site, a compacted layer 6-12 inches thick of cover material was placed over exposed waste materials at the end of the work day during which the material was disposed. This soil was excavated from adjacent areas to provide space for more disposal. The final cover is approximately 2 feet thick and may have been obtained from other stockpiles of fill. Records do not exist to verify where the cover soil came from. Uranium contamination on the surface of the landfill is shown in Figure 4-2.**

Action: **Line 18-19 of Section 2.2 will be revised to read, "The five cells and the adjacent disposal area have been covered with roughly two feet of on-site soils and the evaporation pond has been backfilled, although the exact origin of the cover soils is not known."**

48. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.2 Pg. #: 2-31 Line #: 15-16 Code:
Original Specific Comment #22
Comment: The text states that environmental survey (ES) surface soil samples were analyzed for radionuclides, PCBs, and asbestos; however, on Page 4-8, Line 25, the text indicates that VOCs and toxicity characteristic leaching procedure (TCLP) metals were also analyzed for. This discrepancy should be addressed.

Response: **Agreed.**

Action: **Line 15-16 of Section 2.2.2 will be revised to read, "These four samples were analyzed for radionuclides, PCBs, asbestos, and TCLP metals. Three of these samples were also analyzed for VOCs."**

Lines 24-25 of Section 4.2.3 will be revised to read, "The four Environmental Survey samples were tested for radionuclides, PCBs, asbestos, TCLP metals. Three of these samples were also analyzed for VOCs."

These sections will then be consistent with the results reported in Appendix C.

49. Commenting Organization: U.S. EPA Commentor: Saric
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: **Agreed.**

Action: **Additional surface water (if present) and additional sediment samples will be collected under the Phase II RI in an attempt to define off-site migration via surface water runoff. These samples will be analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

50. 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: **Agreed.**

Action: **Under the planned Phase II RI scope, additional soil samples will be collected and analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters. Specific information will be provided in the OU 2 Phase II RI PSP.**

51. 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: **Environmental Survey sample locations were not surveyed so the location has been estimated for the RI Report. The approximate location of Test Pit #8 is north of the cell boundary and south of the drainage ditch. Although the trench was excavated outside of the boundaries of the cell disposal area, wood and roofing debris was encountered in the trench which indicates that disposal activity occurred in this area also. The Environmental Survey report does not give justification for the location of this test pit.**

Action: **The text will be changed to read, "...southern side of the drainage ditch."**

52. 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: **Agreed.**

Action: **Under the current Phase II RI scope, soil borings will be advanced within the expected boundaries of the evaporation pond and soil samples will be collected from each soil boring to characterize contamination in the area of the evaporation pond. These samples will be analyzed for the FEMP RI/FS HSL analytes and for radiological parameters.**

In addition, borings are planned to define the location and contents of the cells (trenches). Samples from each of the borings will be collected and analyzed for the FEMP RI/FS HSL analytes and radiologic parameters to chemically classify waste materials within the trenches. Specific information will be provided in the OU 2 Phase II RI Project Specific Plan.

53. 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: **Agreed.**

Action: **See action to Comment/Response No. 49.**

54. 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: **Agreed.**

Action: **See action to Comment/Response No. 49.**

55. 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: **Agreed.**

Action: **The text will be revised to reflect that one of the objectives outlined in the RI Work Plan for sampling groundwater was to "Determine the extent (both vertically and horizontally) of groundwater contamination..."**

56. 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: **Agreed.**

Action: **The text will be revised to indicate that the wells were sampled quarterly for a variety of parameters. A table (Attachment A) will be prepared for each waste unit to indicate the sampling frequency and analytes.**

Additional wells are being planned under the Phase II RI. Once these wells are installed, groundwater samples from these wells and from existing wells will be collected and analyzed for the FEMP RI/FS HSL analytes and radiologic parameters.

57. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.5 Pg. #: 2-35 Line #: 15 Code:
Original Specific Comment #31
Comment: None of the RI/FS ground-water data for any of the analytical parameters (radiological, HSL, or general ground-water quality) was validated. DOE should address this deficiency to determine data usability and to identify future actions for obtaining critical data where data gaps are evident.

Response: **The groundwater data has been validated and the qualifiers have been added to the database.**

Action: **The Appendices will be revised to include the data validation qualifiers and the footnotes noting that samples were not validated will be removed. In addition, any samples used to supplement the RI data will also be validated before use.**

58. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.5 Pg. #: 2-35 Line #: 21 Code:
Original Specific Comment #32
Comment: Perched ground water and three leachate samples were not collected from the portion of the SWL that exhibited the highest levels of contamination. Samples should be collected from locations where screening instruments indicated the highest levels of contamination; otherwise, sampling will result in an inaccurate estimate of the level of contamination in the SWL.

Response: **Agreed.**

Action: **Under the scope of the planned Phase II RI, additional subsurface soil samples will be collected and analyzed for the FEMP RI/FS HSL parameters and for radiologic parameters. The locations of these**

subsurface samples will be such that the level of contamination in the SWL can be defined.

59. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.5 Pg. #: 2-35 Line #: 24 Code:
Original Specific Comment #33
Comment: Analytical results for ground-water and leachate samples collected during the recent trenching activities should be incorporated into the revised RI report. The data appears to be critical to fate and transport modeling for determining the risk to future receptors. Presenting this information solely in the FS is inadequate.

Response: **Agreed.**

Action: **The data from the recent trenching activities will be validated and incorporated into the revised (Phase II) OU 2 RI Report.**

60. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.6 Pg. #: 2-35 Line #: 27-37 Code:
Original Specific Comment #34
Comment: The text refers to a wetland adjacent to the SWL. This wetland area and all site wetlands should be thoroughly inventoried and classified according to U.S. Fish and Wildlife standards using the Cowardian System of Wetland and Deepwater Habitat Classification. The locations of all site wetlands should also be presented on a map.

Response: **Agreed.**

Action: **A wetlands delineation study is currently being performed and is expected to be completed in February 1993. The results of this study will be incorporated into the revised (Phase II) OU 2 RI Report as necessary.**

61. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.7 Pg. #: 2-35 Line #: 39-40 Code:
Original Specific Comment #35
Comment: The text states that a composite sample was collected from a depth of 0 to 18 feet in the SWL. Figure 4-1 indicates that the depth of fill at the location of the composite sample is about 13 feet. This indicates that the composite sample includes both landfilled waste and underlying native soil. The usefulness of this sample is questionable. The rationale for collecting this type of sample and the intended data uses should be presented in the RI report.

Response: **The boring was drilled to a depth of 18 feet to conclusively determine that the fill/native soil interface had been reached. The rationale for collecting a composite sample consisting of both landfilled waste and underlying native soils is not known.**

Action: **The validation of the CIS data, which will take into account the nature of this sample, will determine its usefulness. It is not anticipated that the**

CIS composite samples will be used for any purpose other than indicating areas of potential contamination.

62. Commenting Organization: U.S. EPA Commentor: Saric
Section #: Figure 2-4 Pg. #: 2-36 Line #: NA Code:
Original Specific Comment #36
Comment: The direction of ground-water flow should be indicated on the figure.

Response: **Agreed.**

Action: **The revised (Phase II) RI Report will provide figures to depict groundwater flow directions as appropriate.**

63. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.2 Pg. #: 2-40 Line #: 23-28 Code:
Original Specific Comment #37
Comment: Although the waste description in Section 2.3.1 indicates that VOCs and metals were disposed of in the sludge ponds, the objectives stated in Section 2.3.2 indicate that for surface soils, only the nature and extent of radionuclide contamination will be characterized. Samples were not analyzed for metals and organics during the CIS or RI/FS. DOE should identify the lack of organic and metals data for sludge pond surface soil as a data gap. In addition, only one surface soil sample was collected within the boundary of the sludge ponds for radionuclide analyses during either the CIS or RI/FS. This sample provides the only data collected at a defensible data quality level; such data alone cannot be used to quantify risk. With such a limited set of data, the stated objectives for sludge pond surface soil sampling have not been met.

Response: **See Comment/Response No. 1. Agreed.**

Action: **Under the Phase II RI, additional surface soil samples will be taken. These samples will be analyzed for the FEMP RI/FS HSL parameters and for radiological parameters. The status of the RFA data will be determined and used accordingly.**

64. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.2 Pg. #: 2-42 Line #: 1-2 Code:
Original Specific Comment #38
Comment: The text states that surface soil samples were collected for "more extensive" radionuclide analyses from the "north-central vicinity of the North Lime Sludge Pond." Figure 2-7 indicates that no surface soil samples were collected from the North Lime Sludge Pond. This discrepancy should be addressed.

Response: **Agreed. Some sentences were inadvertently omitted from this section, making the text difficult to understand. Lines 40 of page 2-40 and 1-2 of page 2-42 will be changed to read, "Surface media samples were analyzed for cesium-137, radium-226, ruthenium-106, thorium-232, and uranium-238 at the on-site gamma spectroscopy laboratory. As a result of the on-site screening, nine of the samples from the Lime Sludge Ponds were selected for more extensive radiological**

analyses. An additional surface media sample (46-187) was collected about 50 feet north of the North Lime Sludge Pond for the more extensive radiochemical analysis (Figure 2-7).

Action: **The revised (Phase II) RI Report will include the missing text.**

65. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.3 Pg. #: 2-42 Line #: 34-36 Code:
Original Specific Comment #39
Comment: The analytical parameters listed in the text do not agree with those listed for the same study on Page 4-40, Lines 12 through 14. This discrepancy should be addressed.

Response: **Agreed.**

Action: **Lines 35-36 on page 2-42 will be changed to read, "...and analyzed for radionuclides, VOCs, SVOCs, pesticides/PCBs, dioxins/furans, herbicide organics, organophosphorus pesticides, metals, and TCLP metals/organics."**

Lines 12-14 of page 4-40 will be changed to read, "Samples from these two borings were analyzed for radionuclides, VOCs, SVOCs, pesticides/PCBs, dioxins/furans, herbicide organics, organophosphorus pesticides, metals, and TCLP metals/organics."

These sections will then be consistent with the results reported in Appendix D.

66. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.3 Pg. #: 2-42 Line #: 38 Code:
Original Specific Comment #40
Comment: Data collected as part of the RCRA facility assessment (RFA) program is not included in Section 2.1.4 (Data Validation). DOE should discuss the quality of the RFA data either here or in Section 2.1.4.

Response: **This data has not yet been validated so the quality of it is unknown. Once the data is validated, an assessment will be made as to its usability in the RI Report.**

Action: **The quality and uses of this data will be discussed in this section.**

67. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.5 Pg. #: 2-44 Line #: 24 Code:
Original Specific Comment #41
Comment: Specific Comment No. 29 regarding objectives for the characterization of perched ground water also applies here.

Response: **Agreed.**

Action: **See Comment/Response No. 55.**

68. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.5 Pg. #: 2-44 Line #: 27 Code:
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: **Nine wells are located in the vicinity of the Lime Sludge Ponds, but only eight were sampled. Well 1176 was not sampled; the reason is not known.**

Action: **The text will be revised to state that 9 wells were installed, but that Well 1176 was not sampled.**

69. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.5 Pg. #: 2-44 Line #: NA Code:
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: **See Comment/Response No. 1. Well 4101 was sampled during the RI and the results are reported in Appendix D, Table D-9. In addition, results are also reported for well 4102, which is also screened in the Great Miami Aquifer.**

Action: **Additional samples are planned from these wells, other existing wells, and from proposed wells under the Phase II RI to supplement the FEMP RI/FS HSL data for groundwater samples.**

70. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.5 Pg. #: 2-44 Line #: 29 Code:
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: **See Comment/Response No. 1. Agreed.**

Action: **The text will be revised to indicate that the wells were sampled quarterly for a variety of parameters. A table (Attachment A) will be prepared for each waste unit to indicate the sampling frequency and analytes.**

Under the scope of the Phase II RI, additional wells will be installed. Groundwater samples from these wells and from existing wells will be collected and analyzed for the FEMP RI/FS HSL analytes and radiologic parameters.

71. 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: **The RI/FS groundwater laboratory results were in validation at the time the draft OU 2 RI was submitted. The RI/FS groundwater data has been validated and the qualifiers have been added to the database.**

Action: **The Appendices will be revised to include the data validation qualifiers and the footnotes noting that samples were not validated will be removed.**

In addition, any samples used to supplement the RI data will also be validated before they are used.

72. 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: **The surface soil samples from the Inactive Flyash Pile were not analyzed for PCBs during any of the three studies.**

Action: **Additional samples of the surface and subsurface soils are being planned under the Phase II RI. These samples will be analyzed for a variety of parameters, including PCBs.**

73. 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: **Agreed.**

Action: **Under the scope of the Phase II RI, additional soil samples will be collected. These additional samples will be analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

74. 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: **Agreed.**

Action: **Line 15 on page 4-76 will be changed to read, "Two borings were drilled for the Environmental Survey, and 5 samples were collected (FE0604WP3B from one boring, and FE0605WP3B, FE0607WP3B, FE0608WP3B, and FE0609WP3B from the other, henceforth to be referenced as ES-604, -605, etc., respectively)."**

75. 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: **See Comment/Response No. 1. The surface soil samples from the Active Flyash Pile were not analyzed for PCBs during any of the three studies. The use of oils for dust control remains undocumented.**

Action: **Additional samples of the surface soils are being planned under the Phase II RI. These samples will be analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

76. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4.2 Pg. #: 2-47 Line #: 38-39 Code:
Original Specific Comment #50
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: **See Comment/Response No. 1. Agreed.**

Action: **Additional surface soil samples are planned under the Phase II RI and the results will be incorporated into the Risk Assessment. These samples will be analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

77. Commenting Organization: U.S. EPA Commentor: Saric
Section #: Figure 2-11 Pg. #: 2-49 Line #: Code:
Original Specific Comment #51
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: **Sample 0107 is illustrated in two different locations on Figure 2-11. The location in the southwest corner of the flyash pile is correct.**

Action: **Figure 2-11 will be revised accordingly, leaving 8 sampling locations.**

78. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4.3 Pg. #: 2-50 Line #: 2-31 Code:
Original Specific Comment #52
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: **See Comment/Response No. 1. As noted, several subsurface soil samples (1723, 1724, 1726, and 1820) were analyzed for PCBs and the results are reported in Appendix E.**

Action: **Subsurface soil samples are being planned as part of the Phase II RI. These additional samples will be analyzed for the FEMP RI/FS HSL analytes (including PCBs) and for radiologic parameters.**

79. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4.4 Pg. #: 2-50 Line #: 36 Code:
Original Specific Comment #53
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: **See Comment/Response No. 1. Agreed.**

Action: **Additional surface water and sediment samples will be collected under the Phase II RI. These samples will be analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

80. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4.4 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: **See Comment/Response No. 1. See Comment/Response No. 81.**

Action: **See action for Comment/Response No. 81.**

81. 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: **Sample ASIT-007 was analyzed for organophosphorous pesticides, pesticides/PCBs, semi-volatile organics, volatile organics, metals, and general chemistry parameters.**

Action: **The text will be revised to reflect that only this sample was analyzed for these parameters, while the other samples were analyzed for Ra-226, Ra-228 and total uranium. The results for sample ASIT-007 have been validated and the qualifiers will be added to the database.**

Additional samples will be collected under the Phase II RI and analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.

82. 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: **Samples ASIT-004, ASIT-005, ASIT-006 and ASIT-007 were each analyzed once for Ra-226, Ra-228, and total uranium. Samples ASIT-004 and ASIT-005 were each analyzed for radionuclides, total uranium, total thorium, general chemistry parameters, and metals.**

Action: **The text will be revised to indicate analytical parameters for each sample. Additional surface water samples will be collected under the Phase II RI and analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

83. 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: **Agreed.**

Action: **Additional surface water and sediment samples will be collected under the Phase II RI and analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

84. 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: **The sediment samples were only analyzed for Ra-226, Ra-228, and total uranium.**

Action: **The text will be revised to reflect the correct analytes.**

Additional sediment samples are proposed to be collected under the Phase II RI and analyzed for the FEMP RI/FS HSL analytes and radiologic parameters.

85. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.4 Pg. #: 2-58 Line #: 22 Code:
Original Specific Comment #59
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: **One surface water sample was collected and it was analyzed for Ra-226, Ra-228, total uranium, general chemistry parameters, and metals.**

Action: **The text will be revised to reflect the correct analytes. Additional surface water samples are proposed to be collected under the Phase II RI and analyzed for the FEMP RI/FS HSL analytes and radiologic parameters.**

86. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.5 Pg. #: 2-58 Line #: 37 Code:
Original Specific Comment #60
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: **The RI/FS groundwater monitoring wells were sampled quarterly for a variety of parameters. Well 1711 has been sampled and the samples were analyzed for total uranium and metals.**

Action: **A table similar to the attached table (Attachment A) will be prepared for each waste unit to indicate sampling frequency and analytes. The text will be revised to refer to this information.**

The results from Well 1711 will be incorporated into the RI once they are validated. Additional samples may be collected in this area under the Phase II RI to supplement the data generated during the RI/FS investigation.

87. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.5 and Figure 2-17 Pg. #: 2-60 Line #: NA Code:
Original Specific Comment #61
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: **Agreed.**

Action: **Additional monitoring wells will be installed in the area of the Inactive Flyash Pile under the Phase II RI. These wells, along with existing wells will be sampled. The samples will be analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

88. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.1 Pg. #: 2-62 Line #: 36-37 Code:
Original Specific Comment #62
Comment: The text states that DOE reported that contaminated soil from the South Field may have been removed and disposed of elsewhere in the (Fernald Environmental Management Project (FEMP). DOE should provide more information regarding this activity, especially with regard to the current location of this contaminated soil.

Response: **Operational history of the South Field disposal area is vague. It is possible that soil and/or gravel was obtained from this area for use on site. The location of any such material and the amount of contamination is unknown.**

Action: **The reference "DOE (1988b)" is incorrect and will be deleted from the text.**

89. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.5 Pg. #: 2-62 Line #: 3 Code:
Original Specific Comment #63
Comment: The OU 2 RI data indicates that monitoring well 1711 was never sampled. This well provides one of the few opportunities to directly evaluate an OU 2 unit's effect on ground water. This well should be sampled and the samples analyzed for the entire suite of radionuclides and HSL parameters, and the analytical data should be presented in the revised (Phase II) RI Report.

Response: **Well 1711 has been sampled and were analyzed for total uranium and metals.**
Action: **The results from Well 1711 will be incorporated into the RI once the results are validated. Additional samples will be collected in this area under the Phase II RI to supplement the data generated during the RI/FS investigation.**

90. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.2 Pg. #: 2-64 Line #: 10-36 Code:
Original Specific Comment #64
Comment: The text should indicate that two surface soil samples were collected from the South Field during the RI/FS and were analyzed for radionuclides. Also, on Page 4-97, Line 27, the text indicates that South Field ES surface soil samples were analyzed for PCBs while Section 2.6.2 indicates no such analysis. This discrepancy should be addressed.

Response: **A single RI/FS surface soil sample was collected in the South Field area. The ES surface media samples were not analyzed for PCBs. Section 2.6.2 reports the correct list of analytes.**

Action: **This paragraph will be added to the end of Section 2.6.2 on page 2-64, "During the RI/FS, one surface media sample was collected for radionuclide analysis from the northeast area of the South Field." Locations 1046, 1516, 1517, and 1518 will be deleted from Figure 2-19. Lines 35-36 on page 4-97 will be changed to read "One surface soil sample was collected as part of the RI/FS, and this sample was analyzed for radionuclides." PCBs will be deleted from the list of analytes for ES surface samples on line 27 of page 4-97.**

91. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.2 Pg. #: 2-64 Line #: 10-36 Code:
Original Specific Comment #65
Comment: The text indicates that South Field CIS and RI/FS surface soil samples were analyzed only for radionuclides. Therefore, none of the objectives stated in Section 2.6.2 has been met with regard to organics and metals. This data gap should be identified in the RI report. For ES surface soil data for the South Field, the limited number of samples (only five from an area at least 20 acres in size) and the limited analyses (SVOCs, pesticides, and non-TCLP metals were not analyzed for) are clearly insufficient to characterize the nature and extent of nonradionuclide surface soil contamination. This should be identified as a data gap in the RI report.

Response: **Agreed.**

Action: **Additional surface soil samples are proposed to be collected under the Phase II RI. These samples will be analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

92. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.2 Pg. #: 2-64 Line #: 27 Code:
Original Specific Comment #66
Comment: Figure 2-19 indicates that virtually all the CIS surface soil samples collected from the South Field and analyzed for radionuclides were from the northern perimeter of the South Field. Most of the South Field remain uninvestigated, and the eastern, southern, and southwestern boundaries of radionuclide surface soil contamination have not been established. Therefore, the nature and extent of radionuclide contamination of South Field surface soils remain a data gap. This should be identified in the RI report.

Response: **Agreed.**

Action: **See Comment/Response No. 91.**

93. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.3 Pg. #: 2-66 Line #: 16-17 Code:
Original Specific Comment #67
Comment: This text and the text on Page 2-64, Line 28, indicate that a substantial amount of CIS radiologic screening data was collected for South Field surface soils. Because this information was used to determine which samples would be retained for further analyses and to locate subsequent CIS subsurface borings, a summary of the screening data should be presented in the RI report.

Response: **Agreed.**

Action: **The CIS screening data will be obtained and incorporated into the RI Report.**

94. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.3 Pg. #: 2-64 to 2-68 Line #: NA Code:
Original Specific Comment #68
Comment: The descriptions of the ES, CIS, and RI/FS analyses performed on samples collected during the various boring and trenching programs at the South Field are confusing. This information should be presented in tables so that the reader can readily ascertain which analyses were performed on each sample collected.

Response: **Agreed.**

Action: **A table similar Attachment B may be prepared for inclusion in the text to describe the various sampling programs conducted at the South Field.**

95. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.3 Pg. #: 2-66 Line #: 28 Code:
Original Specific Comment #69
Comment: During the RI/FS, only Trench No. 6 was excavated in the southern portion of the South Field area. This trench is not located in the area identified in the CIS as having the highest potential for radionuclide contamination. Therefore, the data for this trench may not accurately characterize the level of contamination in the South Field area. DOE should address this data gap.

Response: **Agreed.**

Action: **Additional soil borings are proposed for the South Field area under the Phase II RI. These samples will be analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

96. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.4 Pg. #: 2-68 Line #: 23-24 Code:
Original Specific Comment #70
Comment: The text states that no sediment or surface water samples were collected in the South Field during any of the investigations. The rationale for not collecting such samples should be provided, and the lack of related information should be identified in the RI report as a potential data gap.

Response: **Agreed.**

Action: **Surface water and sediment samples will be collected from drainage ways downstream of the South Field under the Phase II RI to define the impacts of surface water runoff. These samples will be analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

97. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.5 Pg. #: 2-68 Line #: 29-32 Code:
Original Specific Comment #71
Comment: The text states two objectives of the ground-water sampling conducted in the South Field: (1) to determine whether contaminants from the South Field have migrated to ground water and (2) to characterize perched ground water that may be encountered during remediation of the South Field. These objectives are vague and do not allow for full determination of the nature and extent of ground-water contamination associated with the South Field. DOE should more clearly define the objectives of the South Field ground-water investigation. If the objective of the South Field ground-water investigation does not include fully determining the nature and extent of contamination, DOE should clearly state when and how this data gap will be addressed.

Response: **Agreed.**

Action: **The text will be revised to reflect the FEMP RI Work Plan which indicates that one of the objectives of the groundwater sampling was to "determine the extent (both vertically and horizontally) of ground water contamination" from the**

South Field. Four additional monitoring wells will be installed under the Phase II RI to define impacts to the perched groundwater and the shallow aquifer. These additional wells, along with selected existing wells, will be sampled and the samples that are collected will be analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.

98. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.5 Pg. #: 2-68 Line #: 35 Code:
Original Specific Comment #72
Comment: No wells are located within the actual South Field disposal area. This data gap prevents DOE from achieving its objectives of characterizing perched ground water that may be encountered during remedial actions and determining whether the South Field is a source of ground-water contamination. DOE should address this data gap by investigating ground-water contamination within the South Field disposal area.

Response: **Agreed.**

Action: **Additional monitoring wells will be installed under the Phase II RI to define impacts to the perched groundwater and the shallow aquifer. These additional wells, along with selected existing wells, will be sampled and the samples that are collected will be analyzed for the FEMP RI/FS HSL analytes and for radiologic parameters.**

99. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.6.5 Pg. #: 2-68 Line #: 35 Code:
Original Specific Comment #73
Comment: The RI report inaccurately states that RI/FS monitoring wells in the South Field area were sampled quarterly and that the samples were analyzed for radionuclides, VOCs, SVOCs, pesticides/PCBs, metals, and general water quality parameters. Well samples were not analyzed quarterly for all the parameters stated. The RI report should accurately present the sampling frequency and analytes for each well.

Response: **Agreed.**

Action: **The text will be revised to indicate that the wells were sampled quarterly for a variety of parameters. A table similar to the attached table (Attachment B) may be prepared for each waste unit to indicate what compounds each well was analyzed for and when the wells were sampled.**

100. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.1.2 Pg. #: 3-5 Line #: 32 Code:
Original Specific Comment #74
Comment: Paddys Run is located west of FEMP, not east as stated in the RI report. This error should be corrected.

Response: **The reference in the text is to the Great Miami River, which does flow to the east of the site.**

Action: **The text has been revised as follows:**
"Paddys Run is a tributary of the Great Miami River, which lies to the east of the site and flows generally southwest."

101. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.1.3.3 Pg. #: 3-13 to 3-23 Line #: NA Code:
Original Specific Comment #75
Comment: The discussion of site-wide hydrogeology lacks information in several critical areas. No information regarding hydraulic conductivities (K) is presented. Average K values should be provided for the upper and lower portions of the Great Miami Aquifer as well as for the clay interbed. DOE should also discuss whether any significant differences in ground-water flow direction occur between the upper and lower portions of the Great Miami Aquifer.

Response: **It is agreed that additional hydrogeological discussion is required in the RI report.**

Action: **Additional hydrogeological data will be provided in the report, including hydraulic conductivity ranges for the hydro-stratigraphic units identified in the text.**

102. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.1.3.3 Pg. #: 3-13 Line #: 27 Code:
Original Specific Comment #76
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: **The discussion of the regional and local hydrogeology will be consistent with the assumptions used in OU-2 modeling. The range of the clay thickness will be accurately reported in the revised (Phase II) RI Report.**

Action: **The revised (Phase II) RI will be revised to accurately discuss the regional geology. The range of the clay thickness will be accurately reported in the revised (Phase II) RI Report.**

103. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.1.3.3 Pg. #: 3-23 Line #: 1-4 Code:
Original Specific Comment #77
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: **It is not clear if there is any relevance of either groundwater mounding or local low elevations at the K-65 Silos to the OU-2 RI, since it appears that groundwater flow direction remain relatively constant and to the east during peak infiltration periods. The discussion of regional groundwater conditions will be revised to focus on important factors that bear directly on the OU-2 waste units. Regional groundwater issues will be differed to OU-5.**

Action: **The discussion will be altered to delete the discussion of groundwater mounds and troughs unless it directly influences flow at the OU 2 waste units. The Figure will be replaced to provide a clear indication of seasonal trends in flow direction in the vicinity of the OU 2 waste units.**

104. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.1.6.3 Pg. #: 3-39 Line #: 40-41 Code:
Original Specific Comment #78
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: **According to the FEMA flood map (June 1, 1982) for the county of Hamilton, Ohio, the 100-year flood plain extends along Paddy's Run through the north boundary of the site. However, flood hazard factors have not been determined.**

Action: **Figure 3-18 will be revised based on the FEMA map. A study has been initiated as part of the OU 2 Feasibility Study to more accurately determine the 100 year and 500 year flood plains in the site area.**

105. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.2 Pg. #: 3-46 Line #: 32 Code:
Original Specific Comment #79
Comment: The description of waste in the SWL should be revised to include observations from the fall 1992 trenching investigation.

Response: **Agreed.**

Action: **The July 1992 SWL trenching data will be included in the revised (Phase II) RI Report.**

106. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.2 Pg. #: 3-51 Line #: 25 Code:
Original Specific Comment #80
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: **It does not appear possible to construct sensible groundwater elevation maps from the three referenced wells. It is agreed that the boring logs suggest that the wells are not wells are not monitoring the same zone or zones. Review of the hydrographs indicates the following:**

- Hydrographs for Wells 1035 and 1038 appear to move in opposite directions over most of their graphs from 1988 to 1992. The amplitude of change is about 4 feet for Well 1038 and about 7 feet for Well 1035.

- The maximum elevation for groundwater in the well 1035 hydrograph is approximately 580 feet, while the elevation of the nearby drainage is 579.3 feet. This suggests that the intermittent drainage is in hydraulic communication with Well 1035. This also suggests that Well 1038 does not respond to flow in the drainage.

- The hydrograph for Well 1037 shows no elevation change that can be attributed to local rainfall recharge over the period of record from 1988 to 1992. The elevation measured in the well corresponds to the bottom of the well from June 1988 to about March, 1990. The amplitude of observed elevation change is about 6.5 feet.

- The hydrographs generally indicate that the monitored strata are not strongly influenced by local rainfall, and that well 1037 is clearly the least responsive monitoring well of the three.

The data indicate that the till underlying the Solid Waste Landfill is relatively impermeable in some regions of the landfill.

Action: **Hydrographs from other nearby monitor wells completed in the till should be examined to determine if the observed responsiveness in the three wells is to be expected. The available hydrographs will be provided with discussion in the revised (Phase II) RI Report. Additional groundwater monitoring wells are proposed for completion in the Solid Waste Landfill as part of additional characterization.**

107. 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: **The magnitude of water elevation changes appears to vary from year to year at the FEMP. To be precise, the years of record should be stated when discussing observed water level changes.**

Action: **The text will be changed to read as follows:**

" Groundwater elevation data from the Great Miami Aquifer beneath the Lime Sludge Ponds is available from monitor well 2042 from May, 1988 to March, 1991 (Table D-14). Minimum elevation was 511.85 feet above mean sea level (FMSL), or 65.35 feet below the surface, on August 7, 1988. The maximum elevation was 524.85 FMSL, or 52.56 feet below the surface, on February 22, 1991.

108. 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: **A map of the South Field/Flyash Piles showing groundwater gradients will be useful.**

Action: **A map will be presented to show the gradients in the hydrostratigraphic units in the South Field/Flyash pile area.**

109. 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: **It is agreed that the cross-sections are not highly accurate. Schematic representation of the Active Flyash Pile is shown in Figure 3-36 (SE of 2048) and the Inactive Flyash Pile is shown in Figure 3-37 (NW of 4018). However, these are not intended to be used for material estimates.**

A more accurate map of thickness of Inactive Flyash is presented in Section 4.6.2 and Figure 4-15, while the Inactive Flyash thickness is presented in Section 4.5.2 and Figure 4-11. Since material estimates will be provided in the Feasibility Study additional work to improve Figure 3-36 and 3-37 does not seem warranted.

Action: **None proposed.**

110. 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: **Agreed.**

Action: **Additional boring will be advanced in the South Field area to locate the till/flyash interface. Details of the field investigation will be provided in the Phase II RI PSP.**

111. 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 ground-water quality are not possible without ground-water data from the potential source area. This data gap should be addressed.

Response: **Agreed.**

Action: **Additional groundwater monitoring well will be installed in the South Field to define the direction of groundwater flow. Details of the field investigation program will be provided in the Phase II RI PSP.**

112. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.1 Pg. #: 4-1 Line #: 13-30 Code:
Original Specific Comment #86
Comment: The text describes the usability of ES, CIS, and RI/FS data. The text states that much of the CIS data is adequate to be used for site characterization and risk assessment. The text implies that only the samples analyzed on site for radionuclides will not be used in the quantification of risk. DOE should more clearly state the intended uses for all CIS data. DOE should also thoroughly document that all CIS data to be used in the quantification of risk has been evaluated and validated under approved quality assurance (QA) and QC procedures applicable for the intended data uses. During the RI, DOE should have collected sufficient numbers of samples to determine the usability of the CIS and ES data.

Response: **CIS data will be used to refine estimates of nature and extent of contamination only if review of QA/QC indicates that it is unsuitable for other purposes.**

However, it may be used as during the draft RI, to provide additional information on CPCs. The use of CIS data in this manner does not alter the report's conclusions in any way.

Action: **CIS data will be used to supplement RI data in nature and extent of contamination and risk assessment sections.**

113. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.1 Pg. #: 4-2 Line #: 1-4 Code:
Original Specific Comment #87
Comment: The text states that CIS samples were typically not analyzed for total thorium and total uranium and that related concentrations were estimated based on the results of isotopic analyses. These statements raise several other issues:

1. Most of the data tables presented in Section 4 indicate that many of the RI/FS values for total thorium and total uranium are estimated. The data tables and text should more clearly indicate which values are measured and which values are estimated for each sample.

2. Most of the data tables indicate that total uranium values were estimated using values measured for U-235 and U-238; however, many of the data tables indicate that samples were not analyzed for these parameters. DOE should explicitly demonstrate how the total uranium values are calculated. While this approach for estimating total uranium concentrations may be valid in cases where FEMP wastes contain uranium isotopic abundances representing secular equilibrium conditions, considerable inaccuracy will be introduced if the waste streams contain enriched or depleted uranium. The Site-Wide Characterization Report (DOE, August 1992) reports that U-235 concentrations in FEMP uranium waste range from 0.2 to 1.1 percent. This indicates that FEMP waste streams contain both enriched and depleted uranium. Therefore, the degree of uncertainty associated with these calculations should be fully discussed for all data.

3. Based on the documented level of usability and uncertainty associated with the total uranium estimates, DOE should fully support its claim that total uranium estimates are usable in the context of an RI/FS risk assessment and in the characterization of the nature and extent of contamination.

4. Regardless of the results of the data validation, the total uranium values are estimates and should be qualified with the appropriate data qualifier.

Response: **Each of the above comments will be answered according to their sub-part:**

Response 1: **It is agreed that the tables and discussion are not clear on the exact analytical method, the uncertainty of the method, the calculation method used and assumptions inherent in the quality assurance for the data. Table 2-1 does, however, list the basic references required to complete the discussion.**

Action 1: DOE proposes to discuss the analytical methods, calculations and quality assurance methods in the following Sections:

ES Radiological Data- further discussed in Section 2.1.1.2
CIS Radiological Data- further discussed in Section 2.1.2.2
RI/FS Radiological Data- further discussed in Section 2.1.3.1

A discussion will be included in Section 4.1.1 of the RI that compares the methods used and assesses the usability of the data.

Response 2: It is agreed that uncertainties associated with the calculations should be discussed in the report. A good synopsis of observed uranium depletion/enrichment in FEMP waste samples can also be found in the CIS Report, V.2 pgs.3-10 to 3-30.

The observed deviation discussed in the CIS and the Site Wide Characterization Report of 0.2-1.1 percent in ^{235}U (as compared to the natural abundance of 0.771% for ^{235}U) is still a small percentage of total U. This difference is made even less significant when examined in terms of the conversion from uranium activities to concentration:

$$U_{Total}\ (mg/kg) = {}^{235}U\ (pci/g)/2.163\ (pci/ug) + {}^{238}U(pci/g)/0.336(pci/ug)$$
$$^{234}U(pci/g)/6.22 \times 10^{3}$$

Where: 2.163 pci/g is the specific activity of ^{235}U, in pico curies per gram;
0.336 pci/g is the specific activity of ^{238}U;
6.22×10^{3} pci/g is the specific activity of ^{234}U, and
the origin of the equation is found in "Data Validation Program, Rev. 0, US DOE Oak Ridge Operations Office, 1991, pgs. D-3 to D-5.

The equation is six times more sensitive to the activity of ^{238}U than it is to ^{235}U, and even 10% change in ^{235}U will only affect the total U calculation by about 0.5%.

The conversion from total uranium concentration to total activity is more sensitive to the equilibrium status of the uranium isotopes. The formula for converting to activities from the total uranium concentration to total activity is the following:

Total Uranium Activity (pCi/g) = total U (ug/g)x 0.9927 (%U-238)x 0.336 (pCi/ug)+
total U (ug/g)x 0.0072 (%U-235)x 2.16 (pCi/ug)+
total U (ug/g)x 0.000055 (%U-234)x 6220 (pCi/ug)

An increase in ^{235}U from 0.72% (the natural abundance) to 2% will increase the calculated ^{235}U activity by 6 fold, and will increase in total activity by about 3% (depending on the depleted isotopes).

Action 2: A discussion of the assumptions and accuracy of the radiological data will be presented in the revised (Phase II) RI Report.

Response 3: The usability of the total uranium values is related to the analytical method that was used to measure the uranium content. Measurements made by Alpha Spectrometry, as performed at IT laboratories under SOP RSL-304 (RI samples)

and at TMA/Eberline Laboratories by their unpublished procedures (CIS samples), are believed to be representative and valid. This is because analyses of uranium by Alpha Spectrometry were conducted on samples that were processed to chemically separate uranium. Isotope fraction data was measured, and total U was calculated from the inverse of the isotope activities by the equation provided above. Any enrichment or depletion is directly accounted for in the calculation of total U.

Samples analyzed by Gamma Ray Spectrometry (all on-site Uranium measurements conducted during the CIS) are also believed to be accurate within the limits of the expected analytical accuracy. The concentration of ^{238}U is a calculation based upon measurements of ^{234}Th. The $^{234}Th/^{238}U$ relationship would be returned to equilibrium within 10 halflives (about 240 days) if either isotopes were dumped in enriched concentrations. Parent and daughter isotopes are in secular equilibrium.

Action 3: **The accuracy of the radiological data will be discussed in the revised (Phase II) RI Report. All ES and CIS total uranium data that were generated by Gamma Ray Spectrometry will be deleted from the report.**

Response 4: **The Alpha Spectrometry analyses for uranium isotopes, with the calculation of total U that uses the isotopic components, is the best available method to determine total U data and is considered accurate for the reasons stated above. However, all chemical data produced by laboratories relies upon calculations in a similar way to generate numbers, and it is not clear why the value for total uranium should be qualified as estimated and all other data should not.**

The qualifier assigned for an estimated value of total U should be used to represent actual Quality Assurance concerns per the QA plan generated for the project. Assigning a qualifier to all total U data is not justified by the accepted procedures in the plan.

Action 4: **The calculation method will be referenced as needed.**

114. 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: **One soil background data set is proposed for use at the FEMP. Background concentrations for all chemicals of concern in soil are provided in the document titled "CERCLA/RCRA Background Soil Study, Fernald Environmental Management Project, Fernald, Ohio. US DOE, November, 1992. 2 Volumes".**

Action: **The appropriate concentrations will be referenced from the cited report in the revised (Phase II) RI Report.**

115. 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: **One soil background data set are proposed for use at the FEMP. Background concentrations for all chemicals of concern in soil are provided in the document titled " CERCLA/RCRA Background Soil Study, Fernald Environmental Management Project, Fernald, Ohio. US DOE, November, 1992. 2 Volumes".**

Action: **The appropriate concentrations will be referenced from the Cited Report in the revised (Phase II) Report.**

116. 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: **Agreed.**

Action: **Table 4-1 will be changed to reflect the background soil concentrations presented in the report " CERCLA/RCRA Background Soil Study, Fernald Environmental Management Project, Fernald, Ohio. US DOE, November, 1992. 2 Volumes"**

117. 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: **Background concentrations of chemicals and radionuclides is contained in a document being preparation by OU 5. These values will be referenced in the revised (Phase II) RI Report.**

Action: **The relevant background data will be provided in a report prepared by OU 5 and will be referenced in the revised (Phase II) RI Report.**

118. 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: **One set of background soil chemistry data is proposed for use at the FEMP, as presented in the report titled "CERCLA/RCRA Background Soil Study, Fernald Environmental Management Project, Fernald, Ohio. US DOE, November, 1992. 2 Volumes".**

Action: **One set of background data will be presented and used in the revised (Phase II) RI Report.**

119. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.2, Table 4-1 Pg. #: 4-3 Line #: NA Code:
Original Specific Comment #93
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: **Background values of total uranium are presented in the document titled "CERCLA/RCRA Background Soil Study, Fernald Environmental Management Project, Fernald, Ohio. US DOE, November, 1992. 2 Volumes". The uncertainty associated with the total uranium value for soil background is equivalent to that discussed above in to Comment/Response No. 113.**

Action: **A discussion of the accuracy, precision, and limitations of the radionuclide data will be contained in the revised (Phase II) RI Report.**

120. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.2, Table 4-1 Pg. #: 4-4 Line #: NA Code:
Original Specific Comment #94
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

53

(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: **Selection of contaminants of potential concern should consider MCLs, etc. UTLs will no longer be used for background. See Comment/Response No. 259.**

Action: **Background concentrations in groundwater will be reevaluated and considered in the risk assessment.**

121. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.2 Pg. #: 4-6 Line #: 11 Code:
Original Specific Comment #95
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: **The text states that the OU 2 waste areas are downgradient of known source areas, including the former production area. However, we agree that this relationship may not be accurate and that the relationship of the OU 2 waste areas to the groundwater flow gradients should be referenced to specific hydro-stratigraphic units.**

Action: **The discussion on page 4-6 will be revised with regards to the flow of groundwater near the waste units.**

122. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.3 Pg. #: 4-7 Line #: 1-2 Code:
Original Specific Comment #96
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: **See Comment/Response No. 7.**

Action: **Affected analyses will be identified in the revised (Phase II) OU 2 RI Report.**

123. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.3 Pg. #: 4-8 Line #: Code:
Original Specific Comment #97
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: **Agreed.**

Action: **Text will be revised to accurately report sample analytes and will reflect the summary tables.**

124. 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: **Agreed.**

Action: **The text will be revised to accurately reflect the actual sample analyses conducted.**

125. 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: **An analysis of background surface and subsurface concentrations is presented in the document titled "CERCLA/RCRA Background Soil Study, Fernald Environmental Management Project, Fernald, Ohio. US DOE, November, 1992. 2 Volumes". Trends in soil samples that have concentrations that exceed background concentrations should be described where sufficient data exist.**

Action: **Complete the discussion of the data in the revised (Phase II) RI Report by analyzing trends in concentration with depth at the SWL.**

126. 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: **Radionuclide data generated during the ES and the CIS will be deleted from the report tables, text and figures for the following reasons:**

1) The data are from analyses of composite samples,
2) The total uranium data from Gamma Ray Spectrometry analyses conducted by the on-site laboratory are not consistent, within their respective analytical method limits, with the total uranium values calculated from Alpha Spectrometry by TMS/Eberline.

Action: **Data will be deleted from the report and additional data will be generated, as needed.**

127. 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: **Remediation of the SWL will require definition of the boundary for inclusion into the remedy.**

Action: **The data gaps cited will be addressed by the OU 2 Phase II RI; details of the field investigation will be provided in the PSP.**

128. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.3.1 Pg. #: 4-10 Line #: 27 Code:
Original Specific Comment #102
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: **Borehole 49-06, drilled during the CIS, is shown to be within the believed limits of the SWL in Figure 4-1, on page 4-9 of the report. Boring 1035, which reportedly had 0' of fill, had 54 mg/kg of total u detected in a soil sample collected from 21-22.5' deep. The source for the total U contamination is not fully understood at this time.**

Action: **The data gap cited will be addressed by the Phase II RI; details of the field investigation will be provided in the PSP.**

129. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.3.1 Pg. #: 4-10 Line #: 34-35 Code:
Original Specific Comment #103
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: **Examination of aerial photographs from 1950 to the present indicate that face dumping occurred in the east half of the landfill. In photographs available to date, cells are not apparent in the landfill until 1976, and then they are north-south trending features that appear in the northwest corner of the site. As a result, it difficult to know if boreholes encountered berms or fill dirt that was pushed over the dump face. Work is continuing to obtain additional aerial photographs that may provide information about the location of the landfill cells.**

Solid block modeling of the available data indicate that there is poor understanding of the vertical extent of possible contaminant migration. Additional borings are proposed to complete the characterization of the vertical migration of contamination into the till at the Solid Waste Landfill.

Action: **The CIS composite data in Table 4-3 are not considered reliable indicators of contaminant migration at any of the waste units within OU 2, and will be removed from the RI. The remaining data will be incorporated into the preliminary solid model and additional sampling locations will be determined. The scope of work for additional investigation will be presented in the Phase II RI PSP.**

130. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.3.1, Figure 4-2 Pg. #: 4-12 Line #: NA Code:
Original Specific Comment #104

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: **We agree that the location for boring 620 is inconsistently presented with reference to the supposed fill line in the two figures. The conceptual model upon which this dashed line is based appears to be incorrect, however. As discussed in response to Comment #103, available historical aerial photos indicate that face dumping along a southeast-northwest trending open dump was the disposal practice. As a result, there is no exact "extent of fill" line as suggested in Figure 4-2.**

Action: **The figure will be adjusted to reflect a more accurate model for the dumping and all sample locations will be exactly positioned. Sample locations that are approximate will be so noted in the legend of the figure.**

131. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.3.1, Table 4-3 Pg. #: 4-16 Line #: NA Code:
Original Specific Comment #105

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: **The status of this soil sample is not presently known; however, if chemical data are available it will be included in the revised (Phase II) RI Report. It should be noted that additional borings and soil samples are proposed to define the extent of vertical migration, and to sample the possible trenches or evaporation pond in the northwest corner of the landfill.**

Action: **Available data for borehole 1722 will be presented in the revised (Phase II) RI Report.**

132. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.3.1, Table 4-3 Pg. #: 4-13 to 4-17 Line #: NA Code:
Original Specific Comment #106

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: **It is agreed that the data presentation should include clear reference to the methods used to calculate, or measure directly, the total uranium.**

Action: **The table footnotes will be adjusted as needed for the revised (Phase II) RI Report.**

133. 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: **Agreed.**

Action: **The majority of the discussion on the presence of common laboratory contaminants concerned the CIS data, which was not yet validated at the time the**

RI Report was prepared. Since the data has now been validated, several of the common laboratory contaminants have been qualified as "U". Where applicable, the text will be revised to indicate that the presence of any common laboratory contaminants in the samples are post-validation, but because they are common laboratory contaminants, they may be dismissed as a CPC for the risk assessment.

134. 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: **Agreed.**

Action: **The table will be made consistant for the revised (Phase II) RI Report.**

135. 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: **The existing organic data will be combined with the proposed additional data according to the sample locations.**

Action: **The revised (Phase II) RI Report will present the organic and inorganic data according to sample location.**

136. 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: **Additional sediment samples are proposed for Phase II at the SWL.**

Action: **Data from the Phase II sampling will be provided in the revised (Phase II) RI Report.**

137. 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: **Examination of historical aerial photographs of the SWL area reveals a ground scar feature in 1954 that was sampled during the CIS. This is sample 46-349 and sample 46-348 that detected 2832.1 and 450.9 mg/kg, respectively of total U. This is also a potential source area for sediment contamination in the drainage channel.**

Additional sediment samples are planned for collection from the drainage channel, but several source areas exist.

Action: **Additional samples are planned for the drainage ditch.**

138. 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: **It is agreed that samples of surface water should be collected upstream and downstream of the SWL to see if there is measurable impacts from possible contaminated water runoff from the SWL into that reach of the drainage ditch. The drainage ditch is normally dry, and collection of additional samples will depend upon flow conditions.**

Action: **Additional surface water samples will be collected in the Phase II RI collection effort.**

139. 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 (μg/L); however, Figure 4-4 indicates that two surface water samples were collected from this location that exhibited concentrations of 26.0 μg/L and 42.0 μg/L. DOE should address this discrepancy and explain why only the lower value is reported in the text and data tables.

Response: **Agreed.**

Action: **The revised RI will discuss the data from the two sampling episodes.**

140. 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: **It is agreed that surface soil from the SWL and sediment from the drainages need to be correlated for assessment of migration pathways and risk assessment purposes.**

Action: **Additional surface soil samples are proposed to be collected from the SWL and additional sediment samples are proposed to be collected from the drainage ditch during the phase II RI.**

141. 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: **Agreed.**

Action: **Additional sediment and surface water samples will be collected in the Phase II RI; details of the field investigation will be provided in the OU2 Phase II RI PSP.**

142. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.4.3 Pg. #: 4-26 Line #: 36 Code:
Original Specific Comment #116

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: **Additional sediment samples are proposed for Phase II sampling, and the analytes will include metals.**

Action: **Additional sediment and surface water samples will be collected in the Phase II RI; details of the field investigation will be provided in the OU 2 Phase II RI PSP.**

143. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.5 Pg. #: 4-29 Line #: 10-13 Code:
Original Specific Comment #117
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. 64DOE should use the leachate as a source term or provide further justification for not using it.

Response: **It is agreed that "groundwater" or in situ leachate sample results such as those referenced in this section should be considered in determining source terms for the SWL. In addition to the samples collected from ES Test Pit No. 8, in situ leachate samples were also collected from the SWL trenches excavated in 1992. These trenches were located in the waste disposal area while Test Pit No. 8 appears to have located outside the boundaries of the waste disposal area (see Comment/Response No. 51).**

Action: **The analytical results for in situ leachate samples from ES Test Pit No. 8 as well as the recent trenches will be considered in determining the source terms in the groundwater modeling for the SWL.**

144. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.5.1 Pg. #: 4-29 Line #: 23 Code:
Original Specific Comment #118
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: **The hydraulic relationship between well 1037 and the SWL was discussed in response to Comment/Response No. 106. It is not clear if well 1037 contains groundwater that represents any part of the SWL, since it was dry for over a year after installation.**

Action: **Additional wells are proposed for the SWL in the Phase II effort.**

145. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.5.1 Pg. #: 4-29 Line #: 25 Code:
Original Specific Comment #119

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: **It is agreed that the figures, tables and text should be accurate and consistent.**

Action: **An accurate sampling chronology will be prepared and presented in the revised (Phase II) RI Report.**

146. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.5.1 Pg. #: 4-29 Line #: 26-27 Code:
Original Specific Comment #120

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: **The seasonal variation in groundwater gradients should be presented and the possible chemical contamination of Well 2052 should be discussed in terms of accurate flow data. The existing data in the RI are too few for this purpose.**

An examination of seasonal gradients reveals a fluctuating gradient that is relatively flat and directing flow toward the east from the SWL. The statement that Well 2052 is upgradient does not appear to be justified.

Action: **The statement will be deleted, and a discussion of the flow directions will be provided in the revised (Phase II) RI Report.**

147. 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: **Well 2027 is located downgradient from a waste pit, and samples collected from the well are most probably influenced by it. The use of this well to characterize upgradient conditions may be questioned if flow paths perpendicular to the seasonal gradients do not direct groundwater flow past Well 2027, under the SWL and to Well 2037.**

Action: **A complete round of groundwater samples will be collected during Phase II to provide additional data to gage the chemical character of the groundwater. The seasonal groundwater gradients will be examined to define flow paths that move groundwater under the SWL, and the use of Well 2027 as an upgradient well will be examined. Additional wells are planned as part of Phase II if the location of existing monitor wells cannot determine upgradient and downgradient chemical quality in the Upper Great Miami Aquifer at the SWL.**

148. 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: **DOE agrees that organic contamination has been detected in soil and waste samples collected from the SWL, and it is appropriate to define their possible migration into the perched groundwater.**

Action: **Additional perched groundwater samples are proposed during Phase II for the existing wells and the proposed additional wells. Full organic analyte coverage is proposed.**

149. 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: **Agreed.**

Action: **Groundwater samples from three wells will be sampled and analyzed for metals and organic compounds in the Phase II RI; details of the field investigation will be provided in the Phase II RI PSP.**

150. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.7 Pg. #: 4-35 Line #: NA Code:
Original Specific Comment #124

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: **The issue of data adequacy to determine vertical contaminant migration was addressed in Comment/Response Nos. 128-131. Additional sampling will be required to obtain the data that is needed to complete the Feasibility Study.**

Action: **Additional analysis of existing data is on-going to complete the conceptual understanding of the operation of the waste unit and to finalize appropriate sampling objectives. A Phase II sampling effort is planned to address these requirements.**

151. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.7 Pg. #: 4-35 Line #: 28 Code:
Original Specific Comment #125

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: **The location of sample 49-06 with respect to the landfill boundary is unclear since it is believed that open dumping may have been the operating procedure at the SWL. Boring 1035 appears to be located outside of the historical SWL boundaries as defined by the drainage ditch in all historical aerial photos since 1954. The location of a waste pile adjacent to Boring 1035 may have an influence on soil and groundwater quality in that area.**

Action: **Additional soil borings are proposed for the SWL to define the horizontal and vertical extent of contamination. Analysis of historical aerial photographs will continue. No additional sampling is currently planned for the Boring 1035 area.**

152. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.7 Pg. #: 4-35 Line #: 35 Code:
Original Specific Comment #126

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: **Agreed.**

Action: **Additional groundwater sampling is included in the proposed Phase II RI; details will be provided in the Phase II RI PSP.**

153. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.7 Pg. #: 4-35 Line #: 35 Code:
Original Specific Comment #127
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: **Agreed.**

Action: **In addition to additional sampling proposed during the Phase II RI, RCRA chemical data and the complete validated data set from the SWL area will be provided in the revised (Phase II) RI Report.**

154. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.7 Pg. #: 4-35 Line #: 36-38 Code:
Original Specific Comment #128
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: **Agreed.**

Action: **The proposed additional sampling and data interpretation will clarify the issue of SWL impacts on regional groundwater quality.**

155. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.7, Table 4-9 Pg. #: 4-36 Line #: NA Code:
Original Specific Comment #129
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: **Agreed.**

Action: **Background values will be provided whenever possible.**

156. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.7 Pg. #: 4-37 Line #: 5 Code:
Original Specific Comment #130
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: **Agreed.**

Action: **Additional sampling and RCRA data will be included in this evaluation.**

157. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.3 Pg. #: 4-38 Line #: 31 Code:
Original Specific Comment #131
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: **See Comment/Response No. 1. DOE agrees that additional surface sampling will be required to complete the risk assessment and to support remedial alternative selection.**

Action: **Additional surface samples will be collected in the Phase II RI; details will be provided in the Phase II RI PSP.**

158. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.3 Pg. #: 4-40 Line #: 12 Code:
Original Specific Comment #132
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: **Agreed.**

Action: **The revised (Phase II) RI Report will be amended to include the information.**

159. 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: **See Comment/Response No. 1. Agreed.**

Action: **Additional soil samples will be collected around the ponds during the Phase II RI.**

160. 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: **Agreed.**

Action: **The actual location will be determined and the data will be accurately shown on the figures.**

161. 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: **Agreed.**

Action: **The table will be revised.**

162. 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: **See Comment/Response No. 1. Agreed.**

Action: **Additional wells are proposed as part of the Phase II RI; details will be provided in the Phase II RI PSP.**

163. 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: **See Comment/Response No. 1. Well 1042 is located adjacent to the K-65 trench. The uppermost groundwater surface ranges from 5 to 10 feet below the surface and the depth of the trench is estimated to be 4 to 5 feet below the ground after visual inspection. We cannot agree that the Lime Sludge Ponds are the only potential source of contamination found in Well 1042.**

Action: **A trench is proposed adjacent to the K-65 trench with field screening/sampling to determine its effect on groundwater quality. Additional wells are proposed to sample the deeper groundwater downgradient of the ponds (on the east side), and additional shallow wells are proposed to complete a radial flow monitoring network for the Lime Sludge Ponds.**

164. 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: **See Comment/Response No. 1. Agreed.**

Action: **Additional groundwater samples will be collected during Phase II to complete the potential organic contamination characterization.**

165. 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: **Agreed.**

Action: **Perched groundwater will be sampled during the proposed Phase II RI.**

166. 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: **Agreed.**

Action: **A concise and accurate summary of metals detected in groundwater will be included in the revised (Phase II) RI Report.**

167. 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: **Agreed.**

Action: **The status of Boring 1725 will be discussed in the revised (Phase II) RI Report.**

168. 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: **See Comment/ Response No. 1. The Simulated Rainwater Leaching Procedure (SRLP) was performed on the samples, however the results were not usable because the chemical equalibrium was not attained after the scheduled test duration.**

Action: **The outcome of the SRLP testing will be clarified in the revised (Phase II) RI. Additionally soil samples will be analyzed using the procedure during the Phase II RI; details will be provided in the Phase II RI PSP.**

169. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.3.3 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: **Agreed.**

Action: **The background concentrations in native material and the range of concentrations in typical flyash will be compared to the detected values.**

170. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.4.1 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: **See Comment/Response No. 1. Additional sediment samples are proposed to complete the characterization of potential surface water runoff migration pathways. The operating history of the stormwater ditch suggests that it may be an historical contaminant migration pathway.**

Action: **Samples will be collected in the area between the ditch and the Active Flyash Pile; details will be provided in the Phase II RI PSP.**

171. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.4.1 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: **See Comment/Response No. 1. Agreed.**

Action: **Additional sediment samples will be collected in the Phase II RI.**

172. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.4.1 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: **We agree that the surface water concentrations cannot be explained from the reported sediment and soil samples in the area. The source of the surface water that was sampled requires intense scrutiny. If the source is groundwater then additional subsurface investigation will be required. If the source is runoff from a surface feature, then additional investigation of that area will be required.**

Action: **Additional investigation is proposed for the area of the surface water sample collection during the Phase II RI.**

173. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.4.2 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: **Agreed.**

Action: **The required summary will be included in the revised (Phase II) RI Report.**

174. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.4.3 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: **Agreed.**

Action: **The required summary will be included in the revised (Phase II) RI Report.**

175. 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: **Agreed.**

Action: **Additional sediment samples will be collected to characterize the existence of contaminant migration pathways, and to accurately define sources for risk determination.**

176. 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: **Agreed.**

Action: **Available data from boring 1850 will be included in the revised (Phase II) RI Report.**

177. 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: **Agreed. The method of analysis, its accuracy and the limits of the data should be clear from the table.**

Action: **The method of analysis will be ascertained and properly referenced in the table, or the datum will be omitted.**

178. 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: **Runoff from the Inactive Flyash Pile appears to be to the west as well as to the east.**

Action: **Additional samples are proposed to characterize runoff and sediment in both directions; details will be provided in the Phase II RI PSP.**

179. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.4.1 Pg. #: 4-90 Line #: 9 Code:
Original Specific Comment #153
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: **Agreed.**

Action: **Additional sediment and surface water samples are proposed down-slope of the Inactive Flyash Pile; details will be provided in the Phase II RI PSP.**

180. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.4.2 Pg. #: 4-90 Line #: 13-14 Code:
Original Specific Comment #154
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: **Agreed.**

Action: **Additional samples will be to be collected and analyzed for organic compounds.**

181. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.4.3 Pg. #: 4-90 Line #: 17-18 Code:
Original Specific Comment #155
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: **Agreed.**

Action: **Additional detailed discussion of the sample results will be presented in the revised (Phase II) RI Report to summarize a complete data table.**

182. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.4.3 Pg. #: 4-90 Line #: 17 Code:
Original Specific Comment #156
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: **Agreed.**

Action: **As discussed in response to previous comments, additional sediment samples will be collected during the proposed Phase II RI.**

183. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.5.1 Pg. #: 4-90 Line #: 36 Code:

Original Specific Comment #157

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: **Agreed.**

Action: **Available data concerning well 2016 will be presented in the revised (Phase II) RI Report.**

184. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.5.1 Pg. #: 4-90 Line #: 34 Code:
Original Specific Comment #158

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: **An additional well was completed in the Inactive Flyash/Southfield area after the RI Report was submitted. Well 1433 has since detected the highest uranium concentrations in the area. Additional work is proposed to define the source of the uranium in Well 1433, and to complete the understanding of the perched groundwater system in the area.**

Action: **Additional wells are proposed for completion if perched groundwater is found in the Inactive Flyash/Southfield area.**

185. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.5.1 Pg. #: 4-93 Line #: 3 Code:
Original Specific Comment #159

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: **The discovery of elevated uranium concentrations in well 1433, coupled with the elevated uranium concentrations detected in soil samples from the area reinforces the possibility that there is a source of regional aquifer contamination in the Inactive Flyash area.**

Action: **Additional soil samples and wells are proposed in the Phase II RI. At least one well completed in the upper part of the regional aquifer is proposed to trace the source of well 2046 contamination.**

186. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.5.2 Pg. #: 4-93 Line #: 12-15 Code:

Original Specific Comment #160

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: **Agreed.**

Action: **Additional samples are proposed to complete the characterization of organic contamination in the regional aquifer system.**

187. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.7 Pg. #: 4-93 Line #: 36 Code:
Original Specific Comment #161

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: **As discussed above, the discovery of elevated uranium concentrations in Well 1433 suggests that there may be migration from the Inactive Flyash Pile area into perched groundwater.**

Action: **An additional investigation is proposed to define potential migration of contamination to the regional aquifer; details will be provided in the Phase II RI PSP.**

188. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.3 Pg. #: 4-97 Line #: 21 Code:
Original Specific Comment #162

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: **Agree.**

Action: **Additional sedmient and surface water samples are proposed for the Phase II RI effort; details will be provided in the Phase II RI PSP.**

189. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.3.1 Pg. #: 4-100 Line #: 1 Code:
Original Specific Comment #163

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: **Surface sample 24-081 was collected during the CIS from a large waste pile visible in a 1957 aerial photo. The locations of the other CIS samples were biased toward the road where field screening indicated potential elevated uranium concentrations.**

The central part of the South Field requires additional characterization to define the nature and extent of the waste pile, and to define the nature of massive concrete rubble piles that may require a special remedial alternative.

Action: **A significant effort is proposed to complete characterization of the South Field area; the scope will be provided in the Phase II RI PSP.**

190. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.5 Pg. #: 4-128 Line #: 19 Code:
Original Specific Comment #164
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: **Agreed.**

Action: **Additional borings and wells are proposed for the South Field if perched groundwater is discovered.**

191. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.5.1 Pg. #: 4-128 Line #: 36 Code:
Original Specific Comment #165
Comment: The RI report should state that uranium concentrations in well 1046 were above background concentrations for all sampling rounds.

Response: **The determination of background will be completed prior to issuing the revised (Phase II) RI Report. Comparison of all groundwater concentrations to background will be part of the perched groundwater evaluation.**

Action: **An accurate comparison of the perched groundwater chemistry in Well 1046 will be included in the revised (Phase II) RI Report.**

192. Commenting Organization: U.S. EPA Commentor: Saric

Section #: 4.6.5.1 Pg. #: 4-128 Line #: 36 Code:
Original Specific Comment #166
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: **The determination of the potential source of contamination in Well 1516, Well 1517 and Well 1518 is an explicit objective of the proposed Phase II effort.**

Action: **Additional sampling will be proposed in the Phase II RI PSP.**

193. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.5.1 Pg. #: 4-128 Line #: 36 Code:
Original Specific Comment #167
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: **Agreed.**

Action: **Further investigation will be carried out to complete the characterization of the till unit beneath the Southfield; details will be provided in the Phase II RI PSP.**

194. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.5.1 Pg. #: 4-140 Line #: 19 Code:
Original Specific Comment #168
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: **DOE agrees that the characterization of the Inactive Flyash/South Field areas is presently incomplete.**

Action: **DOE proposes to collect additional data and then define the component of the regional aquifer contaminant plume that is originating in the South Field area.**

195. Commenting Organization: U.S. EPA Commentor: Saric

Section #: 4.6.5.2 Pg. #: 4-140 Line #: 33 Code:
Original Specific Comment #169

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: **Agreed.**

Action: **All of the wells in the South Field area will be sampled for metals.**

196. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.7 Pg. #: 4-142 Line #: 20 Code:
Original Specific Comment #170

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: **Agreed.**

Action: **An explicit objective for proposed Phase II work is to define the impacts of Well 1433, to define the source for contamination in Well 1516 and to characterize the regional aquifer plume beneath the Southfield area.**

197. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.0 Pg. #: 5-1 Line #: 1 Code:
Original Specific Comment #171

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 μg/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 accurately represent the physical systems and are of marginal use. DOE should appropriately qualify the results of the modeling considering the empirical evidence that current contaminant levels grossly exceed those predicted by the model.

Response: **See Comment/Response No. 1.**

In reviewing the groundwater modeling it was discovered that values of two important parameters in the vadose zone transport model (i.e. ODAST) applications for OU 2 were incorrectly determined. As a direct result of these errors, both the mass loading rates and loading periods of contaminants were

underestimated. In some cases, the miscalculated potential maximum uranium concentrations in the aquifer were three orders of magnitude too low. The vadose zone modeling and the subsequent saturated zone modeling for OU 2 will be redone to correct the problem. To quantify the impacts of these errors, modeling with corrected ODAST parameters for total Uranium from all the OU 2 waste units is currently underway. Complete results are expected by the end of February.

It is expected that the corrected model with existing source data can closely match the current groundwater conditions in the vicinity of OU 2 waste areas and thus link the groundwater contaminations to the possible sources. However, the revised groundwater fate and transport modeling will include all the additional field data collected in the Phase II RI.

Depending on the final risk assessment approach, the groundwater fate and transport modeling procedure will be modified to support the needs of lower screening level for individual contaminant and accumulated effects from all the contaminants and waste areas.

Action: **The conclusion regarding the OU 2 waste units' impacts on the Great Miami Aquifer (GMA) will be reevaluated by modeling with corrected source loading rates.**

198. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.4.1.3 Pg. #: 5-26 Line #: 25 Code:
Original Specific Comment #172
Comment: The text in this and some later sections uses a screening level of 10^{-7} cancer risk to dismiss contaminants from further consideration. However, each of the scenarios includes multiple exposure routes and typically several dozen potential carcinogens. Therefore, the total risk from the dismissed contaminants could readily exceed the 10^{-6} risk level, the lower limit of concern. DOE should use a screening level of 10^{-8} cancer risk to avoid this possibility.

Response: **Depending on the final risk assessment approach, the groundwater fate and transport modeling procedure will be modified to support the needs of lower screening levels for individual contaminants and accumulated effects from all the contaminants and waste areas.**

Action: **Screening levels will be modified as appropriate.**

199. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.1 Pg. #: 6-1 Line #: 9 Code:
Original Specific Comment #173
Comment: The text states that the RI report was prepared in accordance with available U.S. EPA guidance. This section should be revised to indicate the cutoff date for incorporating additional guidance into the report.

Response: **Agreed.**

Action: **The revised (Phase II) RI Report will specify the cut-off date for incorporation of USEPA guidance.**

200. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.1.1 Pg. #: 6-3 Line #: 4 Code:
Original Specific Comment #174
Comment: This section states that a chemical was excluded as a CPC if site-related concentrations were less than background concentrations. Based on the statistical comparison used in the report, this statement is incorrect because chemicals were excluded if no on-site concentration exceeded the background UTL or, in some cases, if on-site concentrations were less than twice background concentrations. The text should be revised to state that a chemical was excluded as a CPC if on-site concentrations were not found to be significantly above background concentrations. Also, refer to General Comment 9.

Response: **DOE is unclear as to which particular instance(s) the reviewer is referring since the CPC selection process was automated to include all contaminants whose UCL concentrations were above the background UTL value, and to exclude those chemicals with <u>every</u> detection below the background UTL.**

Action: **The text in this line will be modified to read "(1) all site-related concentrations were less than background concentrations"...**

201. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.1.3 Pg. #: 6-8 Line #:NA Code:
Original Specific Comment #175
Comment: The table shows that trespassers are not expected to be exposed to CPCs via ingestion of plants. However, it is not clear whether fruit trees, berry bushes, or similar plants do or may exist on site. Trespassers could ingest fruit from such plants and thereby be exposed to CPCs. The report should include an evaluation of this potential exposure or a discussion of the rationale for its omission.

Response: **This route of exposure would present a minimal risk to trespassers considering the quantity of fruits and vegetables available throughout the year in Ohio. The site-wide characterization report and recent field inspections do not indicate the presence of plants with edible fruit/berries within OU 2. In addition, the quantities ingested on any occasion would be minuscule. In addition, this exposure route was not presented in the Risk Assessment Work Plan Addendum, and input parameters have not been developed.**

Action: **This exposure route will not be evaluated in the risk assessment. The possibility of such exposure will be mentioned, but the likelihood will not be quantitatively evaluated.**

202. Commenting Organization: U.S. EPA Commentor: Saric
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: **While the text does appear to imply that all PAHs were assigned the benzo(a)pyrene slope factor, in reality only the B2 PAHs were handled this way. However, in the Final RI, the toxicity equivalent approach will be used for B2 PAHs, as per P. Van Leeuwen's comments.**

Action: **The text will be modified to reflect the application of the toxicity equivalent approach.**

203. 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: **DOE believes that the future reality does not involve a future resident farmer. However, for the sake of the baseline risk assessment, the future resident farmer is being addressed as per DOE and EPA guidance.**

Action: **This statement will be deleted from the revised (Phase II) RI Report.**

204. 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: **DOE agrees with the comment.**

Action: **The revised (Phase II) RI Report will include in Section 6 summaries of the risks associated with potential exposures to groundwater. These risks will be based on the revised modeling estimates.**

205. 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: **Groundwater screening levels were first presented in the Risk Assessment Work Plan Addendum. The screening limits were applied to groundwater prior to its mixing in the aquifer. This mixing results in additional dilution.**

Action: **DOE will add text clarifying both the source and use of screening level concentrations in the revised (Phase II) RI Report.**

206. 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: **See Comment/Response No. 1. The dichloroethene identified in this sentence is 1,1-DCE. DOE agrees that the use of the word "uncertain" is not appropriate in this context. These contaminants are indicated as being detected only once out of a limited number of samples (5 or less) and at very low concentrations (benzene and 1,1-DCE at 0.002 mg/kg and Aroclor-1260 at a concentration of 0.038 mg/kg. However, when the additional samples are collected, this statement may become irrelevant if these particular chemicals should increase in frequency of occurrence.**

Action: **The text will be revised to reflect the actual site conditions in revised (Phase II) RI Report.**

207. 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: **Existing boring logs and site records will be examined to determine whether the cover thickness is known or can be estimated. The supplemental data collection program will investigate the depth of the cover at the landfill.**

Action: **The text of the revised (Phase II) RI Report will incorporate the findings of the cover investigation.**

208. 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: **The history of the landfill will be reviewed to attempt to determine what other waste materials could have been disposed. However, historical aerial**

photography and other such information indicates that disposal of materials into the landfill was essentially uncontrolled.

Action: **Additional information, if any, that can be determined from the records review will be incorporated into the site descriptions and summarized in this section.**

209. 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: **Agreed.**

Action: **The reported typographical error will be corrected.**

210. 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: **See Comment/Response No. 1. The current number and locations of surface soil samples are inadequate to determine whether this may have occurred. Additional surface media samples are planned, and if the results indicate contamination with PCBs and/or uranium, it will be so noted in this section in the revised (Phase II) RI Report.**

Action: **The text will be revised to incorporate the results and/or conclusions regarding the potential for contaminated oil to have been used as a dust control measure.**

211. 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: **A recent OSWER Directive (No. 928537-08I, dated 5/92) indicates that it is appropriate to determine the distribution of chemicals in a particular medium,**

and thence to determine the arithmetic UCL on either the geometric mean (for log normally distributed data sets) or the arithmetic mean (for normally distributed data sets). When distribution cannot be determined (i.e., some test such as the Shapiro-Wilke W-Test is inconclusive), it may be appropriate to use either the better fit or to use the larger of the two UCLs. The Risk Assessment Work Plan indicated that the maximum concentration would be used as the RME concentration if distribution cannot be determined, but in actuality in the OU 2 RI, the geometric mean UCL is used if the sample set is small. According to the recent OSWER Directive, this is the more conservative approach. The Risk Assessment Guidance for Superfund, DOE agrees, indicates that the use of the geometric mean contaminant concentration in risk assessment is inappropriate.

Action: **The revised (Phase II) RI Report will incorporate a distribution test for those sample sets where distribution is not obvious. After distribution is determined, the appropriate UCL will be calculated.**

212. 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: **Agreed. While it is often not documented whether a published dose-response parameter is based on the administered or absorbed dose, it is not appropriate to assume that absorption efficiency is 100%. The ATSDR profiles and other literature will be used to determine a suitable absorption efficiency, which will then be used to adjust the RfDs and CSFs as a more conservative approach.**

Action: **In the revised (Phase II) RI Report, dermal exposures will be calculated using the Dermal Exposure Guidance document published in January 1992. Permeability constants published in this document will be used in the appropriate calculations. Dermal Reference Doses and Cancer Slope Factors will be adjusted to account for oral absorption efficiency as per the guidance presented in RAGS.**

213. 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: **Agreed.**

Action: **References for all dose-response parameters will be carefully checked. IRIS will be used as the primary reference, with the 1992 HEAST as the secondary.**

However, there are several chemicals for which dose-response parameters are no longer in IRIS. In these cases, either provisional values provided by the EPA will be used or the most recently published values (e.g., from HEAST 1991) will be used and referenced.

214. 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: **Regional background values were used for four metals (mercury, molybdenum, selenium, and silver) that were not detected in the site-specific background soil samples. These four metals will be reevaluated to determine whether site processes or activities indicate that they could be site-related. If so, then they will be added to the list of CPCs.**

Action: **The data will be reevaluated to determine whether these four metals of concern are potentially site-related. The detection limits of the site-specific background samples will be evaluated to determine if they are elevated over regional concentrations. If so, then the use of the regional data is justified. If the detection limits are not higher than the regional values, then the potential for these metals to be related to activities at the FEMP will be considered.**

215. 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: **While the outlier test is described in this section, its application is not appropriate for on-site data. Even though the test was performed on certain analytes, its sole use was in the selection of contaminants of potential concern. However, in no case for OU 2 did a chemical "fall out" of the list of CPCs because of this test, and in all cases, the UCL concentration calculated for the complete data set was used in the risk assessment. In other words, none of the sample points were actually considered to be "outliers" in the final analysis.**

Action: **In the revised (Phase II) RI Report, the outlier test will be omitted for on-site data in this discussion to eliminate confusion on this issue.**

216. 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 x 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: **Agreed.**

Action: **The revised (Phase II) RI Report will utilize the exposure criteria for the inhalation scenario as described.**

217. 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: **Toxicity profiles for other CPCs were prepared for inclusion in the revised Site-Wide Characterization Report.**

Action: **Toxicity profiles for CPCs will be included in the revised (Phase II) RI Report for OU 2.**

218. 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: **DOE agrees that subsurface soil results should not be used as a substitute for surface soil data. Additional data will be collected prior to submission of the revised (Phase II) RI Report.**

Action: **The revised (Phase II) RI Report will incorporate the results of surface soil analyses in the evaluation of appropriate soil exposure scenarios.**

219. 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: **Agreed. The modeling for OU 2 will be confused with "what will actually occur." It is not possible at this time to accurately project what will actually occur.**

Action: **This sentence will be deleted or reworded.**

220. 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: **Agreed.**

Action: **Upon receipt of background surface water and sediment data, it may be necessary to incorporate surface water and/or sediment exposure pathways.**

221. 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: **The analytical results will be reevaluated to determine whether it is appropriate to combine the data sets.**

Action: **Based on the results of the evaluation, the risk assessment will be revised accordingly. Calculation of UCL concentrations for each pond, if required, and estimation of pond-specific risks will be assessed.**

222. 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: **Agreed.**

Action: **The percentage of the total radiological risks attributable to U-238 will be included in the text as requested.**

223. 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: **Agreed.**

Action: **This discussion will be presented in the Nature and Extent of Contamination section of the revised (Phase II) RI Report.**

224. 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: **Agreed.**

Action: **Additional data will be collected in the Phase II investigation to address this comment.**

225. 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: **Agreed.**

Action: **This text of the revised (Phase II) RI Report will be edited to provide clarity.**

226. 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: **Agreed.**

Action: **The word "extreme" will be deleted.**

227. 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 to include a full evaluation of the uncertainties contributed by the CPC selection process.

Response: **Agreed.**

Action: **The revised (Phase II) RI Report will present clear documentation of the CPC selection process and contribution to uncertainty that may arise from the process. Any such uncertainties will be presented in the Uncertainties Section that is to be added.**

228. Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.4.2.1.2 Pg. #: A-4-4 Line #: 13-17 Code:
Original Specific Comment #202
Comment: The text implies that combining sample analytical data for an exposure area may result in an overestimation of risk. However, combining data may also result in an underestimation of risk by diluting high sample concentrations (representing "hot spots") with lower concentrations. This section should be revised to include this additional uncertainty.

Response: **Agreed.**

Action: **The text in the revised (Phase II) RI Report will address this potential contribution to uncertainty and will also be documented in the Uncertainties Section that is to be added.**

229. Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.4.2.1.2 Pg. #: A-4-4 Line #: 19-28 Code:
Original Specific Comment #203
Comment: The text discusses some uncertainties involved with modeling exposure point concentrations, but it does not indicate the potential effects of these uncertainties. This section should be revised to include estimates of the directional effects of these uncertainties.

Response: **Agreed.**

Action: **The revised (Phase II) RI Report will include this discussion in the Uncertainties Section that is to be added.**

230. Commenting Organization: U.S. EPA Commentor: Saric
Section #: A.5.0 Pg. #: A-5-1 Line #: 2 Code:
Original Specific Comment #204
Comment: The text refers to a range of generally acceptable risks under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The text should clarify what is meant by "generally acceptable" and should cite a specific reference for these values.

Response: **Generally acceptable refers to the risk range cited in the NCP 300.430(e) of 10^{4} to 10^{-6}.**

Action: **The text will be modified accordingly.**

231. Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-7 Line #: NA
Code:
Original Specific Comment #205
Comment: The report should clarify the significance of the arbitrarily selected origin for the air dispersion modeling shown in Figure B.1-3. Because waste areas in OU 2 are at different locations, and because their physical locations are considered as origins for modeling air dispersions (see the modeling results presented in Table B.1-3), DOE should explain the purpose of showing an arbitrarily selected origin for the air dispersion modeling in Figure B.1-3.

Response: **The modeling procedures and protocols used in the RI air transport analysis are currently being reviewed. Some issues regarding appropriate modeling procedures and protocols are pending resolution.**

Action: **The modeling procedures will be addressed the OU 2 Phase II RI PSP.**

232. Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Pg. #: B-9 Line #: NA
Code:
Original Specific Comment #206
Comment: Table B.1-3 presents the maximum on- and off-site airborne concentrations; it should also indicate where these concentrations occur. These locations should also be shown on a site map.

Response: **Agreed. Maximum on-site and off-site concentrations are determined with receptor networks that are normally defined in the modeling protocol. The specific receptor network used to determine the concentrations is under review. Maximum on-site and off-site concentrations will be defined.**

Action: **Issues regarding appropriate modeling protocol and procedures are still pending and will be included in the OU 2 Phase II RI Project Specific Plan. Appendix B will be revised to incorporate additional descriptive information and any revisions that may be required to the modeling effort.**

233. 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: **Agreed.**

Action: **All the equations presented in the draft RI report will be checked and corrected.**

234. 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: **Agreed.**

Action: **All the equations presented in the draft RI report will be checked and corrected.**

235. 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: **Agreed.**

Action: **All the equations presented in the draft RI report will be checked and corrected.**

236. 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: **Agreed.**

Action: **All the equations presented in the draft RI report will be checked and corrected.**

237. 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: **Agreed.**

Action: **All the equations presented in the draft RI report will be checked and corrected.**

238. 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:

$$PXi = [100 \bullet Y(S)_E/\rho A]Ss$$

DOE should check and correct this equation if necessary.

Response: **Agreed.**

Action: **All the equations presented in the draft RI report will be checked and corrected.**

239. 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: **Agreed.**

Action: **All the equations presented in the draft RI report will be checked and corrected.**

240. 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: **Agreed.**

Action: **All the equations presented in the draft RI report will be checked and corrected.**

241. 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: **Agreed.**

Action: **The text will be checked and corrected.**
Response:

242. 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: **Agreed.**

Action: **The text will clarify the relevance of Darcy flux in fractured till.**

243. 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: **Agreed.**

Action: **The text will state that the nature of attenuation is also event-specific.**

244. 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: **Agreed.**

Action: **The text will clarify the connections between water-bearing zones.**

245. 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: **Agreed.**

Action: **Total Organic Carbon (TOC) information will be presented in the text.**

246. 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: **Agreed.**

Action: **The text will include relevant information or calculation to support this statement.**

247. 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: **Comment noted.**

Action: **The text will be checked and corrected, if necessary.**

248. 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: **Comment noted.**

Action: **The table number will be checked and corrected, if necessary.**

249. 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: **Agreed.**

Action: **The text will be checked and corrected, if necessary.**

250. 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: **Agreed.**

Action: **Normalized concentration will be defined in the revised text.**

251. 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: **Agreed.**

Action: **A list of constituents and ranges of concentrations will be provided.**

252. 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: **Agreed.**

Action: **The text will be corrected.**

b. Specific Comments #(1-31) Commentor: Van Leeuwan)

253. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section # 6.1.1 Pg. #: 6-3 Line #: 6 Code:C
Original Comment # 1
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: **Generally, professional judgment can be employed to determine when a chemical is eliminated from consideration as a contaminant of potential concern (CPC, as per J. Saric's comments). This enables the risk assessor to evaluate the samples/depths in which the contaminant was detected, whether or not the contaminant was detected in other media at the site; the chemical's toxicity, its presence above background concentrations, and other such interpretive etc. DOE believes that it is appropriate to incorporate professional judgment into the selection process where appropriate. The 5% frequency of detection was a deviation from the Risk Assessment Work Plan.**

Action: **The CPC selection process will be reevaluated in the revised (Phase II) RI Report to incorporate the same decision points as used and agreed upon in the Risk Assessment Work Plan, as well as to incorporate professional judgment. (For example, if a contaminant is found in only one of multiple subsurface soil samples, and in no other media at that site, that contaminant can be eliminated at a depth greater than 12 feet (the standard EPA default assumption on soil exposures).**

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

Original Comment # 2
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: **Agreed.**

Action: **This table will be revised to reflect earlier comments and Comment/Response Nos. 268 and 269.**

255. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: 6.2.1 Pg. #: 6-13 Line #: 24 Code:M
Original Comment # 3
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: **Agreed.**

Action: **The toxicity equivalents approach will be incorporated into the revised (Phase II) RI Report. The TEFs presented by Clement and Associates will be rounded to one significant figure and applied to the latest slope factor for benzo(a)pyrene (7.3 kg-day/mg).**

256. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.1.4 Pg. #: A-1-9 Line #: 3 Code:C
Original Comment # 4
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: **A recent OSWER Directive (9285.7-08I, dated 5/92) indicates that the distribution of the analytical results should be taken into consideration and the UCLs calculated on either the geometric mean (for log normally distributed data sets) or the arithmetic mean (for normally distributed data sets). When distribution cannot be determined (i.e., some test such as the Shapiro-Wilke W-Test is inconclusive), it may be appropriate to use either the better fit or to use the larger of the two UCLs, not to exceed the maximum detected concentration. The Risk Assessment Work Plan indicated that the maximum concentration would be used as the RME concentration if the distribution could not be determined, but the OU2 RI used the geometric mean UCL. According to the recent OSWER Directive, this is a more conservative approach if the data are log normally distributed.**

Action: **The revised (Phase II) RI Report will incorporate a test for distribution for sample sets where the distribution is not obvious. After distribution is determined (or a better fit can be determined) the appropriate UCL will be calculated.**

257. 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 # 5
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: **Site-specific background data were available for all inorganic and radionuclide constituents, with the exception of four metals that were not detected (mercury, molybdenum, selenium, and silver). The background sampling and analysis plan was submitted to the EPA, and the results were discussed in a meeting held in Cincinnati on January 6, 1992. At that meeting, the consensus was reached among the regulators that the background soil data are no longer a concern.**

Action: **Regional values will be reevaluated in light of the detection limits for the four metals listed above to determine whether it is appropriate to use regional data for those particular analytes.**

258. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A-2.1 Pg. # A-2-4 Line #: Code:M
Original Comment # 6
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 determing the likelihood of contaminant movement to groundwater.

Response: **Agreed.**

Action: **Surface soil samples will be collected, and the results will be incorporated into the revised (Phase II) RI Report.**

259. 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 # 7
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: **The approach for determining background concentrations will be reviewed with the EPA. A determination is needed on whether the UCL is appropriate for the background samples.**

Action: **The revised (Phase II) RI Report will incorporate the mutually agreed-upon approach for the selection of chemicals of concern.**

260. 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 # 8
Comment: Ditto the above comment.

Response: **See Comment/Response No. 259.**

Action: **See action to Comment/Response No. 259.**

261. 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 # 9
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: **Agreed.**

Action: **The uncertainties section will be expanded to include a directional estimate (and qualitative estimate such as "moderate") of the effects of eliminating certain contaminants as CPCs.**

262. 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 # 10
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: **Agreed.**

Action: **Surface soil samples will be collected and the results will be incorporated into the final risk assessment.**

263. 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 # 11
Comment: What list is referred to here? Where is this list in the document (cross-reference)?

Response: **Agreed.**

Action: **DOE will identify the "list"; a reference will be incorporated into the revised (Phase II) RI Report.**

264. 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 # 12
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: **Agreed.**

Action: **The paragraph will be rewritten to clarify the fact that background is not subtracted to calculate risk. Risks will be based on on-site modeling results. Risks will be calculated separately for background comparison purposes.**

265. 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 # 13
Comment: Subsurface soil concentrations are not likely to be an adequate substitute for surface soil data.

Response: **Agreed.**

Action: **Additional surface soil data will be collected, and the results will be incorporated into the revised (Phase II) RI Report.**

266. 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 # 14
Comment: Line 2: Are we talking about the ingestion of leachate here or leachate modeled to groundwater? Clarify.
Line 3: 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: **The screening levels were applied to groundwater (leachate) immediately prior to its mixing with the aquifer. Regarding the 20% rule, the mixing afforded by the aquifer results in an additional dilution by a factor of between 10 and 40, depending on the source type and its physical location. Thus the 10^{-7} risk screening level results in estimated concentrations in the aquifer that correspond to a risk of 10^{-8} or less. The Hazard Quotient screening level of 0.2 would also be decreased by the same factor, to 0.02 or lower.**

Action: **DOE will add text to clarify that the screening level concentrations chosen for constituents in water in the vadose zone ensure that the concentrations corresponds to a risk level of 10^{-6} and a Hazard Quotient of 0.02 are not exceeded.**

267. 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 # 15

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: **Agreed.**

Action: **Additional surface soil data will be collected and the results will be incorporated into the revised (Phase II) Report.**

268. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A.2-5 Pg. #: A-2-31 - 34 Line #: Code:M
Original Comment # 16
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: **Agreed.**

Action: **All exposure input parameters will be reevaluated against prior EPA comments and the Risk Assessment Work Plan. In addition, discussions will be held with the EPA to come to an agreement on all specific parameters. Input parameters will be modified based on the mutually agreed-upon values.**

269. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A.2-6 Pg. #: A-2-35 - 37 Line #: Code:M
Original Comment # 17
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: **See Comment/Response No. 268.**

Action: **See action to Comment/Response No. 268.**

270. 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 # 18
Comment: Region V does allow the use of the TEF approach to be included for PAHs. See additional comments on this issue.

Response: **Agreed.**

Action: **The revised (Phase II) RI will incorporate the TEF approach in the risk assessment. The TEFs used will be those proposed by Clement and Associates, rounded to one significant figure, and applied to the latest CSF for benzo(a)pyrene (7.3 kg-day/mg).**

271. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A.2-8 Pg. #: A-2-40 Line #: Code:M
Original Comment # 19
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: **DOE will reevaluate the dose-response parameters presented.**

Action: **IRIS will be used as the primary source of this information, followed by the 1992 edition of the HEAST. If a number is no longer in IRIS nor provided in the 1992 HEAST, DOE will use either provisional values received from the EPA or will default to the last published value (e.g., HEAST 1991). All values will be specifically footnoted as to their origin.**

272. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A.2-10 Pg. #: A-2-46 Line #: Code:M
Original Comment # 20
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: **There are several limitations associated with the use of the uptake model. First, the model is still available only in draft form. Second, the model applies to children from birth to the age of seven, and such young children are not the only receptors identified at the FEMP. Third, the model provides output in the form of blood lead levels from which risk cannot be quantified. Fourth, lead is not a major contaminant in OU 2 when the levels of uranium, PCBs, dioxin, etc., are considered.**

Action: **Lead risks will be reevaluated using version 0.5 of the Uptake/Biokinetic Model for the child receptors in the current land use scenarios both with and without access controls. For model parameters for which there are no site-specific input parameters, the model default parameters will be used. Blood lead levels will be presented in the final RI, and HIs will be deleted. Lead will be evaluated qualitatively for adults, and the HIs will not be presented.**

273. 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 # 21
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: **Agreed.**

Action: **The revised (Phase II) RI Report will be revised to incorporate this information.**

274. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: Table A.2-11 Pg. #: A-2-66 Line #: Code:M
Original Comment # 22
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: **Agreed. However, all calculations will be changed to the TEF approach (both approaches will not be used).**

Action: **The revised (Phase II) RI Report will be modified to incorporate the TEF approach for B2 PAHs. As this is the preferred approach, no additional uncertainties discussion is required.**

275. 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 # 23
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: **The revised (Phase II) RI Report will not incorporate the concept of unit risks, as it appears to be causing some confusion. The baseline risk assessment will calculate risks based on intakes, as per RAGS.**

Action: **The final risk assessment will be performed using intakes and risks, rather than unit intakes and risks.**

276. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.3.1 Pg. #: A-3-8 Line #: 5-8 Code:M
Original Comment # 24
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: **Agreed.**

Action: **All references to outliers in on-site samples will be eliminated from the revised (Phase II) RI Report.**

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

Original Comment # 25
Comment: I assume that this discussion refers to carcinogenic PAHs, not "total" PAHs, but it is not clear. Clarify.

Response: **This discussion refers to B2 PAHs. However, as the report will be modified to incorporate the TEF approach, this discussion will be eliminated.**

Action: **The revised (Phase II) RI Report will be modified to incorporate the TEF approach, therefore this particular sentence/discussion will also be modified to reflect the change.**

278. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.4.3 Pg. #: A-4-7 Line #:19-20 Code:C
Original Comment # 26
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: **This report was not intended to apportion risks from the entire site to OU2. The baseline risk assessment for each site within each OU will include the resident farmer scenario. Total site risks will be addressed in the Comprehensive Response Action Risk Evaluation report. The uncertainties section should not be modified at this time.**

Action: **None proposed.**

279. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.4.3 Pg. #: A-4-7 Line #: 26 Code:C
Original Comment # 27
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: **When the input parameters are modified, this text will also be modified appropriately.**

Action: **Input parameters will be reviewed and the text will be modified to support the results. Terms such as "conservative" will be eliminated from the text.**

280. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.4.3 Pg. #: A-4-10 Line #: 5-7 Code:M
Original Comment # 28
Comment: The use of other methods available for PAHs is discussed above.

Response: **See Comment/Response Nos. 270, 274, and 277.**

Action: **See Comment/Response Nos. 270, 274, and 277.**

281. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.4.3 #: general Line #: Code:M
Original Comment # 29
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: **The Uncertainties Section will include a discussion of items that tend to bias the risk estimates on the low side.**

Action: **The text will be modified appropriately to include TICs and chemicals lacking dose-response parameters.**

282. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.5.1 Pg. #: A-5-1 Line #: 13 Code:C
Original Comment # 30
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: **Agreed.**

Action: **The text will be revised.**

283. Commenting Organization: U.S. EPA Commentor: Pat Van Leeuwen
Section #: A.5.1.1 - .5 Pg. #: A-5-1 .... Line #: Code:M
Original Comment # 31
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: **The DOE does not believe that the UBK model is appropriate to use for several reasons. First, the model is still available in draft form only. Second, the model applies only to children under the age of seven, and there are many scenarios evaluated at the FEMP that involve adults. Third, the model provides output in the form of blood lead levels, which can only be addressed qualitatively (i.e., is the result less than 10 μg/dL?).**

Action: **The risk assessment will be modified to incorporate the latest version of the UBK model (version 0.5) for all child receptors. Blood lead levels will be presented. Adult receptors and exposures will be addressed qualitatively.**

c. Specific Comments #1-44 (Commentor: Jablonski et al)

284. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 1.3.1.1 Pg. #: 1-16 Line #: 27 Code: C
Original Comment # 1
Comment: The text states that the North Lime Sludge Pond is usually covered with 2 to 3 feet of water, but the water cover has been observed, on occasion, to be up to 7 feet deep. This waste area was recently observed to be mostly dry with sparse vegetation, except for a puddled area in the western portion. Also, the berm around the perimeter of the pond does not seem high enough to hold 7 feet of water without overflowing. Please revise the background information on the OU 2 waste areas to reflect current and possibly future intended conditions.

Response: **Agreed.**

Action: **The background information on the OU 2 waste areas will be revised to reflect current and possible future land-use conditions.**

285. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.1.1 Pg. #: 4-1 Line #: 29 Code: C
Original Comment # 2
Comment: It is stated earlier in this paragraph that methods of sample collection and analysis during the Environmental Survey and CIS were not in strict conformance with procedures adopted in 1988 under the RI/FS QAPP. Please explain then how such data can therefore be used for screening purposes.

Response: **Data generated from the CIS sampling were collected according to general guidelines in effect at that time. These were standard field methods, which are not significantly different than the procedures formally adopted in the 1988 RI/FS QAPP. The collection methods and analytical procedures are close enough to permit use of ES and CIS data for determining nature and extent of contamination.**

Action: **None proposed.**

286. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.1.1 Pg. #: 4-1 Line #: 29 Code: C
Original Comment # 3
Comment: Please clarify whether any of the Environmental Survey or CIS data was used for the contaminant fate and transport modeling or the risk assessment.

Response: **Risk assessment used CIS data only to define additional potential chemicals of concern. These data were identified in the chemicals of concern selection tables (see Table A-3). The extent of CIS data use in the fate and transport modeling is not known.**

Action: **None proposed; the same approach will be used in the Phase II RI. The use of CIS data in fate and transport will be determined; the modeling will be revised if necessary.**

287. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.1.1 Pg. #: 4-1 Line #: 37 Code: C
Original Comment # 4
Comment: Explain how the risk assessment was performed using both isotopic and total measurements when radionuclide carcinogenity slope factors in the HEAST tables are isotope specific.

Response: **Risks were also calculated for exposure to total uranium, which has a reference dose.**

Action: **This will be clarified in the text.**

288. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.1.2 Pg. #: 4-2 Line #: 13 Code: C
Original Comment # 5
Comment: Please state the source of the site-specific background data; was the background data from the CERCLA/RCRA Background Soil Survey.

Response: **Agreed.**

Action: **The background data for soil will be defined by the report titled " CERCLA/RCRA Background Soil Study", (US DOE,1992).**

289. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Figure #: 4.2.3 Pg. #: 4-10 Line #: 32 Code: C
Original Comment # 6
Comment: Please explain why the RI/FS surface soil sampling of the Solid Waste Landfill was performed at only one location outside of the landfill boundary and not within the boundaries of the landfill itself. The elevated concentrations (133 → 228 pCi/g of U-238, 368 → 1180 pCi/g for total uranium) detected in RI/FS samples just outside the boundary of the Solid Waste Landfill would have seemed to indicate the need for additional RI/FS surface soil sampling. Further, section 4.2.4.1 states that a potential source of sediment contamination is the surface soil in the Solid Waste Landfill, another indication that additional RI/FS surface soil sampling may have been necessary.

Response: **Samples collected across the drainage from the SWL are believed to be associated with a ground scar area seen in a 1954 aerial photo, and not with the SWL.**

Action: **Additional soil samples are proposed in the Phase II RI to characterize the SWL.**

290. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Figure #: 4-4 Pg. #: 4-28 Line #: N/A Code: C
Original Comment # 7
Comment: Please state in section 4.2.4.1 and in the legend of this figure what the dashed, triple-dotted line is and why the surface water and sediment samples were taken along this line.

Response: **The triple dot and dashed line represents an ephemeral drainage.**

Action: **The appropriate legend will be added to Figure 4-4. The following will be added to Section 4.2.4.1:**

> **"Sediment samples were collected from the channel of an ephemeral drainage downstream of the Solid Waste Landfill (SWL), adjacent to the SWL and at the upper boundary of the SWL."**

291. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.2.5.1 Pg. #: 4-29 Line #: 26 Code: C
Original Comment # 8
Comment: Please explain how it can be said that the upgradient Well 2052 contains higher concentrations of uranium. Figure 4-5 indicates that most of the uranium values for Well 2052 are < 1.0 μg/L or < 1.0 pCi/L while the uranium values of the downgradient Well 1038 range from 1.2 pCi/L to 6.9 pCi/L for U-234 and U-238, and from 4 μg/L to 11 μg/L for U-total.

Response: **An examination of groundwater gradients indicates that groundwater flow in the Upper Great Miami aquifer is from the west to the east beneath the SWL. This suggests that monitor well 2052 is possibly downgradient of the SWL, but is certainly not up-gradient. This gradient relationship appears for all seasons monitored. Perched groundwater in monitor well 1038 is not in the same groundwater system that is monitored by well 2052.**

Action: **Additional wells are proposed for completion at the SWL during the Phase RI to confirm the perched nature of the groundwater system and resolve the issue of hydrodynamics within the clay till material surrounding the SWL.**

292. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.3.3 Pg. #: 4-38 Line #: N/A Code: C
Original Comment # 9
Comment: Please explain why no RI/FS surface media samples were taken within the boundaries of fill of each of the Lime Sludge Ponds.

Response: **See Comment/Response No. 1. Surface soil samples are primarily of use for risk assessment purposes. Additional samples will have to be collected if the CIS surface soil data base cannot be validated.**

Action: **Additional surface soil samples are proposed to be collected to satisfy risk assessment samples needed from the Lime Sludge Ponds.**

293. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.3.3 Pg. #: 4-40 Line #: 1 Code: C
Original Comment # 10
Comment: Please insert a figure showing the locations and results of subsurface sampling much like what was done in Figure 4-3, Extent of Uranium Concentration in Subsurface Media in the Solid Waste Landfill.

Response: **Agreed.**

Action: **Data from Table 4-12 and Table 4-13 will be included on Figure 4-6 to display the concentrations.**

294. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.3.4 Pg. #: 4-49 Line #: 7 Code: C
Original Comment # 11
Comment: Please explain why there were no RI/FS sediment samples collected within the Lime Sludge Pond study area.

Response: **The Lime Sludge Pond area contains no drainages. Surface soil samples were collected from the border areas surrounding the ponds.**

Action: **None proposed.**

295. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.3.5 Pg. #: 4-40 Line #: 1 Code: C
Original Comment # 12
Comment: Please insert a figure showing the locations and results of groundwater well sampling much like what was done in Figure 4-5, Uranium Concentrations in Groundwater in the Solid Waste Landfill Study Area.

Response: **Agreed.**

Action: **A figure presenting the data will be added to the revised (Phase II) RI Report. Figure 2-9 will be used as the base for adding the data presented in Table 4-18. The additional figure will have the following title: "Figure 4-7.5. Uranium and Thorium Concentrations in Groundwater in the Lime Sludge Ponds Area"**

296. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 4.4.3 Pg. #: 4-57 Line #: 24 Code: C
Original Comment # 13
Comment: Please explain why there were no RI/FS surface media samples collected for the Active Flyash Pile. Also explain why there were no RI/FS subsurface media samples collected within the fill area of the Active Flyash Pile.

Response: **See Comment/Response No. 1. Samples collected during the RI/FS were intended to supplement existing sample data from the ES and the CIS efforts. Figure 4-9 presents the surface media sample analyses while Table 4-20 summarizes data from borings completed within the Active Flyash Pile.**

Action: **Additional samples are proposed for collection during the Phase II RI from the surface of the Active Flyash Pile. Three borings are also proposed to collect supplemental data to confirm the chemical nature of the active flyash matrix, and allow alternatives to be evaluated in the Feasibility Study.**

297. 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: **CIS samples were apparently collected from suspected locations within the waste unit. For example, sample 24-241 was collected from a pile of material that was visible in a 1954 aerial photo. As a consequence, CIS data are probably representative of waste samples and not contaminated native materials. The ES and RI/FS sampling was directed at examining contamination of native material.**

Action: **Additional surface media samples are proposed to complete the Risk Assessment at the Inactive Flyash Pile. Additional sampling is also proposed in the Inactive Flyash area to improve understanding of the nature and extent of contamination. Additional aerial photographic analyses are underway to determine if discernable dumping patterns can be found to support selection of remedial alternatives. The results of the aerial photo analyses and the additional samples will be provided in the revised (Phase II) RI Report.**

298. 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: **Only one RI/FS surface media sample was taken in the South Field area because it was believed that the CIS data would be sufficient to characterize the area.**

Action: **Additional surface soil samples from the South Field are being planned under the Phase II RI.**

299. 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: **The rationale for RI/FS sampling in the South Field was the same as described in response to Comment #13, namely, it was believed that only limited sampling was required to supplement existing data. The discovery of elevated uranium concentrations in the perched groundwater and the loss of the CIS radiological data for risk assessment purposes requires additional sampling and data interpretation in the South Field Area.**

Action: **Additional surface and subsurface samples are proposed for the South Field.**

300. 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: **See Comment/Response No. 1. Agreed. The rationale for not collecting surface water and sediment samples in the South Field is not known.**

Action: **The collection of surface water and sediment samples in the South Field to evaluate off-site migration is planned under the Phase II RI.**

301.

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 descriptive and complete as Section 5.3.3, Groundwater Modeling and Transport Analysis, being that the air pathway is potentially viable for contaminant movement.

Response: **Agreed.**

Action: **This section of the revised (Phase II) RI Report will be revised to present additional information relative to the conceptional model, justification for model selection, modeling protocol, OU 2 air transport mechanism, and OU 2 emission sources. Section 5.3.1 will be revised to incorporate additional descriptive information.**

302. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 5.3.1 Pg. #: 5-8 Line #: 27 Code: C
Original Comment # 19
Comment: For the purposes of determining maximum on-site and off-site airborne concentrations of resuspended particles, a model or process should have been used that specifically determines the locations of highest airborne concentration in addition to modeling on gridded receptor locations. Such models are used for radionuclide NESHAP compliance to locate where the maximally exposed individual potentially could be.

Response: **Agreed. Maximum on-site and off-site concentrations are determined with receptor networks that are normally defined in the modeling protocol. The specific receptor network used to determine the concentrations given in the RI is not known at this time. Maximum on-site and off-site concentrations will be defined.**

Action: **Issues regarding appropriate modeling protocol and procedures are still pending and will be included in the revised Phase II RI Report when they are resolved. Section 5.3.1 of the revised (Phase II) RI Report will be revised to incorporate additional descriptive information and any other revisions that may be required to the modeling effort.**

303. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 5.3.1 Pg. #: 5-9 Line #: 4 Code: C
Original Comment # 20
Comment: The means and tools (computer programs and/or software) with which the resuspended particle modeling was performed should be stated, at least in the written response to these comments.

Response: **Agreed.**

Action: **Section 5.3.1 of the revised (Phase II) RI Report will be revised to define the protocol and computer models used to conduct particulate air dispersion modeling.**

304. Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 5.3.1 Pg. #: 5-9 Line #: 4 Code: M
Original Comment # 21
Comment: In calculating the resuspension rates and the highest on-site and off-site airborne particulate concentrations for each of waste areas, calculations should have been performed to determine areas on-site and off-site that are maximally affected by the cumulative effects of all the waste areas.

Response: **Agreed.**

Action: **Issues regarding appropriate modeling protocol and procedures used in the draft RI air transport analysis are unresolved. In the event that the modeling effort requires revision, Section 5.3.1 will be revised to include the cumulative effects of all the waste areas.**

305.
Commenting Organization: U.S. EPA Commentor: Gene Jablonowski
Section #: 5.3.1 Pg. #: 5-9 Line #: 14 Code: C
Original Comment # 22
Comment: Off-site airborne concentrations within five miles of the FEMP site should be based upon receptor location calculations, possibly by a 100-meter x 100-meter grid method or on an area of higher population receptor basis. This would aid in determining airborne concentrations at nearby towns or other populated areas near the FEMP site; similar to modeling for radionuclide NESHAPs compliance.

Response: **Annual average concentrations of resuspended particles were calculated at receptor points around the entire FEMP site. The receptor grid was located on a 100-meter x 100-meter grid spacing that extended out to and along the FEMP boundary. A review of the RI air transport analysis is underway to determine the maximum on-site and off-site concentrations.**

Action: **The revised (Phase II) RI Report and modeling results will identify the maximum on-site and off-site concentrations using appropriate protocol and procedures.**

306. 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: **Agreed.**

Action: **The surface water and transport modeling will be presented in more detail in the revised (Phase II) RI Report.**

307. 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: **Agreed.**

Action: **More discussion will be provided in the revised (Phase II) RI concerning the attenuation of radionuclides with relatively long half-life (> 1,000 years) or low mobility.**

308. 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: **See Comment/Response No. 304.**

Action: **See action to Comment/Response No. 304.**

309. 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: **At this point in time, a single offsite receptor cannot be identified. The air and groundwater transport models show that the plume centerlines are different for different sites and media within OU 2. The maximum contaminant concentrations will be encountered at the property boundaries. Cumulative effects of all sites and OUs will be addressed in the Comprehensive Response Action Risk Evaluation that will be completed after all OU investigations are**

complete. In addition, until all data are available to fully evaluate all remedial alternatives, it is not possible to determine cumulative risks.
Relative to the air transport analysis, see Comment/Response No. 304.

Action: **Relative to the air transport analysis, see Comment/Response No. 304.**

310. 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: **Subsurface soil samples should not be used in the evaluation of surface soil exposures. Additional surface soil samples will be collected during Phase II of the RI, and these results will be incorporated into the revised Phase II RI Report.**

Action: **Additional surface soil sampling is planned. Results will be incorporated into the revised risk assessment.**

311. 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: **"Chemical of concern" is the typical terminology applied by the USEPA in risk assessments. The RPM has requested the phrase "chemical of potential concern" or CPC. In deference to these two disparate requests, DOE proposes that the phrase "contaminant of potential concern" be used, with the acronym "CPC".**

Action: **The text will be modified to substitute the phrase "contaminant of potential concern" and the acronym "CPC" where appropriate.**

312. 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: **Agreed.**

Action: **The text in this section will be expanded to discuss in more detail specific deviations from the Risk Assessment Work Plan.**

313. 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: **The references (EPA 1991b;EPA 1992b) refer to the Health Effects Assessment Summary Tables published annually by the EPA.**

Action: **The title of these documents will be inserted in this sentence after the word "and".**

314. 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: **Agreed. However, the phrase "Contaminants of Potential Concern" will be used, as stated in Comment/Response No. 311.**

Action: **The titles of these sections will be changed to "Contaminants of Potential Concern".**

315. 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: **Agreed. However, the text should not include references to the phrase "outlier" as these results are on-site samples. These "outlying" values were used in the risk assessment, and were not actually discarded as the phrase "outliers" indicates.**

Action: **The text will be modified to include discussions of the histograms for B2 PAHs and OCDD and the elevated concentrations at the upper end of the range of distribution.**

316. 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: **Agreed.**

Action: **The requested information will be added to the text in the appropriate sections.**

317. 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: **The radionuclide data were available from the CIS work done in the late 1980s. This information was used to locate several monitoring wells and soil borings.**

Action: **A brief discussion of the rationale used to locate sampling stations will be added to this section.**

318. 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: **Agreed.**

Action: **The FEMP windrose used in Figure B.1-1 will be revised to be consistent with the information given in Table B.1-1.**

319. 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: **The application of the equation on Page B-4 is being evaluated.**

Action: **DOE will investigate as to whether the equation given on Page B-4 was applied as given or just contains a typographical error. DOE will also investigate the method for estimating fugitive emissions in 7.1.2 of Control of Open Fugitive Dust Sources (Cowherd, Muleski, Kinsey, EPA, 1988) which takes into account vegetative cover. The results will be included in the revised Phase II RI Report.**

320. 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: **See Comment/Response No. 1. Agreed.**

Action: **The collection of surface samples from all OU 2 waste units for particle size analysis is planned as part of the Phase II RI. Also an accurate representation of the physical characteristics of the waste units will be incorporated into the model.**

321. 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: **The wind profile law in the surface boundary layer is found to follow a logarithmic distribution. The distribution is described in the following equation:**

$$u(z) = \frac{u^*}{0.4} \ln \frac{z}{z_0} \quad \text{for } z > z_0$$

where u = wind speed (cm/sec)
u^* = friction velocity (cm/sec)
z = height above test surface (cm)
z_0 = roughness height (cm)
0.4 = von Karman's constant, (dimensionless)

From the discussion contained on Page B-4 of Section B.1.3.1, u^* is equal to 12 mph (536.4 cm/sec), z is 10 meters, however it is not clear from the text what values were used for the roughness length or the percentage of the time the wind speed exceeds 12 mph at 1 foot above the surface.

Action: **DOE will investigate to determine what values were assigned to these variables. Also, a review of the FEMP stability array for 1989 indicates that there may be incorrect data values for certain stability classes and wind speed groups. DOE will also investigate this possibility and determine if the data values have an effect on the resuspension emission rate. The results will be included in the revised Phase II RI Report.**

322. 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: **Agreed.**

Action: **The correct model name will be used in the reference.**

323. 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: **On-site meteorological data has been collected for other annual periods besides 1989, however the availability of other annual periods for dispersion modeling**

activities is uncertain at this time. The RI air transport analysis did not address annual radionuclide NESHAPs, Subpart H compliance modeling.

Action: **DOE will investigate the availability of additional on-site meteorological data and report it accordingly.**

324. 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: **Agreed. It appears that there maybe some unusual data values for certain stability classes. Incorrect data values in the stability array may be responsible for incorrect concentration calculations using the dispersion model.**

Action: **DOE will investigate the calculation procedure used to generate the 1989 FEMP stability array. The need for additional dispersion modeling activities will be determined when issues regarding appropriate modeling protocol and procedures are resolved.**

325. 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: **Results of the fugitive dust modeling for the OU 2 waste units is given in Table B.1-3. Typical dust loadings in ambient air for each of the OU 2 waste units can be estimated from the waste area dimensions and the resuspension emission rate given in Table B.1-3. The RI air transport analysis did not compare modeled radionuclide concentrations with ambient air monitoring results for 1989.**

Action: **Issues regarding the appropriate modeling protocol and procedures are unresolved. Additional information regarding comparisons with available ambient monitoring data will be included in the Phase II Site Specific Plan.**

326. 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: **Airborne concentrations for contaminants from the Solid Waste Landfill were based on subsurface soil data because no surface soil samples were collected within the boundary of the Solid Waste Landfill during the RI study.**

Action: **The collection of surface samples from all OU 2 waste units for particle size and contaminant analysis is planned as part of the Phase II RI.**

327. 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: **The fate and transport model is based on units of mass. The results can be converted to activity provided the appropriate analytical data is available.**

Action: **The revised (Phase II) RI Report will provide both values, where practicable.**

B. OHIO EPA COMMENTS/DOE RESPONSES

1. General Comment-#1-4 (Commentor: Ohio EPA)

328. Commenting Organization: OEPA Commentor:
Section #: N/A Pg. #: Line #: Code:
Original Comment # 1
Comment: The RI Report should be revised to incorporate any additional data gained to date. These data must include samples from monitoring well 1433, leachate samples for the solid waste landfill trenches, and logs for the trenches within the solid waste landfill. These data are essential to assessing completeness of data for the operable unit investigation.

Response: **Agreed.**

Action: **The revised (Phase II) RI Report will incorporate additional data including analytical results for groundwater samples from monitoring well 1433 and leachate samples from the Solid Waste Landfill trenches, as well as field logs for the trenches within the Solid Waste Landfill.**

329. Commenting Organization: OEPA Commentor:
Section #: N/A Pg. #: Line #: Code:
Original Comment # 2
Comment: As stated in previous Ohio EPA comments, the use of a number of background groundwater sampling locations is unacceptable. Ohio EPA's previous comments were aimed at avoiding a situation such as this. DOE is now in a position which requires immediate attention to developing an acceptable background groundwater data base.

Response: **A FEMP background groundwater and surface water characterization study is currently underway as an OU 5 project. The study approach, including statistical procedures and selection of wells, has been discussed with Ohio EPA and US EPA.**

Action: **Following regulatory agreement with the FEMP background groundwater and surface water study, the background levels developed will be used in the revised (Phase II) RI Report.**

330. Commenting Organization: OEPA Commentor:
Section #: Pg. #: Line #: Code:
Original Comment # 3
Comment: The document references GPR and magnetometer studies of the waste units, yet fails to provide any figures or data from these studies. This information should be included within the report to add to the overall insight into each waste unit. Additionally, the text states that areas of magnetic readings were avoided during sampling activities. Such biased sampling may have prevented DOE from investigating concentrated source areas (i.e. buried drums).

Response: **It is agreed that figures or data from the GPR and magnetometer studies, if useful, should be reported. Also it is agreed that a biased approach to sampling of certain waste units, namely the Solid Waste Landfill and the South Field, would be more productive in characterizing these units.**

Action: **The referenced studies will be reviewed and, if found to be of value, the data and other information will be used to develop the sampling plans for the Phase II RI PSP. Results of these studies will be reported in the revised (Phase II) RI Report.**

331. Commenting Organization: OEPA Commentor:
Section #: Pg. #: Line #: Code:
Original Comment # 4
Comment: The RI report fails to determine whether any of the waste units are contributing to groundwater contamination presently. Significant groundwater contamination does occur near a number of the waste units. The resolution of the waste units as groundwater contamination sources can not be put off until the OU5 RI, since the OU2 ROD should be complete before the issuance of the that RI.

Response: **Agreed.**

Action: **See action to Comment/Response No. 22.**

2. Specific Cmment - #1-119
(Commentor: Ohio EPA and GeoTrans)

332. Commenting Organization: OEPA Commentor:
Section #:1.3.1.2 & 1.3.1.2 Pg. #:1-16 Line #: Code:
Original Comment # 1
Comment: DOE should include in these sections information relevant to the fact that the lime sludge ponds are RCRA units. This information will be necessary during the evaluation of remedial alternatives for these waste units. RCRA will be an ARAR for these waste units.

Response: **Agreed. Evaluation of the basis of the classification of the Lime Sludge Ponds as RCRA units is in progress. If appropriate, an application to reclassify the Lime Sludge Ponds as solid waste units will be filed.**

Action: **The RCRA status of the Lime Sludge Ponds will be discussed along with pertinent background information will be presented in the revised (Phase II) RI Report.**

333. Commenting Organization: OEPA Commentor:
Section #: 1.3.3.2 Pg. #:1-21 Line #: Code:
Original Comment # 2
Comment: The information gained from the walkover surveys during the removal action should be included within the RI to supplement existing surface soil sampling data. The survey data can be used for a qualitative view of the waste unit.

Response: **Agreed.**

Action: **Results of the walkover surveys of the Inactive Flyash Pile and South Field during removal actions will be reviewed and will be incorporated into the revised (Phase II) RI Report as qualitative data, if useful in supplementing the existing surface soil sampling data.**

334. Commenting Organization: OEPA Commentor:
Section #: 1.3.3.3 Pg. #: 1-21 Line #: Code:
Original Comment # 3
Comment: Some of the surface soil sampling locations from this removal action may have been placed within the operable unit 2 waste unit boundaries. These data should be reviewed to determine if any additional surface soil data is available for the OU2 units.

Response: **Agreed.**

Action: **The results of sampling conducted in conjunction with the Waste Pit Area Runoff Control Removal Action will be reviewed and if appropriate incorporated into the revised (Phase II) RI Report.**

335. Commenting Organization: OEPA Commentor:
Section #:1.3.3.4 Pg. #:1-22 Line #: Code:
Original Comment # 4
Comment: It is unclear from this paragraph if all information gained from the firing range investigation is included in the RI. If additional data are available (e.g. organic, inorganic and radiological contaminants), they should be included in this report.

Response: **Agreed. Only lead concentrations in soil samples and TCLP extract are presented in the RI report under Section 4.6.3.3. and in Tables 4-38 and 4-39. The analytical program for the Firing Range Removal Site Evaluation samples are reported to include inorganic, full-HSL and radiological analyses.**

Action: **All analytical data generated in the Firing Range Removal Site Evaluation will be incorporated into the revised (Phase II) RI report.**

336. Commenting Organization: OEPA Commentor:
Section #: Pg. #: P2-21 Line #: 7 Code:
Original Comment # 5
Comment: DOE does not verify that monitoring wells 2014, 3014, and 3016 meet the QA/QC requirements of the RI work plan. If not, the data must be evaluated to determine its usability.

Response: **These wells were installed before the QA/QC requirements of the RI Work Plan were developed.**

Action: **To ensure the integrity of these wells, the (Phase II) RI will include an evaluation of them. If any leakage above the screened interval is detected, previous data will be qualified as unusable and the wells will be plugged, abandoned, and possibly replaced.**

337. Commenting Organization: OEPA Commentor:
Section #: Pg. #: P2-22 Line #: 17 Code:
Original Comment # 6
Comment: How long were the sampling events?

Response: **Quarterly RCRA groundwater sampling is required to be completed within a month's time. During this time, one team can sample roughly 3 wells per day.**

Action: **The text will be clarified.**

338. Commenting Organization: OEPA Commentor:
Section #:2.1.3.4 Pg. #:2-22 Line #:19 Code:
Original Comment # 7

Comment: Table 2-3 is incorrectly referenced here. The correct reference is most likely Table 2-4.

Response: **Agreed.**

Action: **The text will be revised to reference Table 2-4.**

339. Commenting Organization: OEPA Commentor:
Section #: 2.2.5 Pg. #: P2-35 Line #: Code:
Original Comment # 8
Comment: Why were monitoring wells installed in the landfill instead of downgradient of the unit?

Response: **Monitoring wells were installed in the landfill to assess the amount of vertical contamination from the waste unit. The fact that none were installed downgradient of the landfill is a data gap that will be addressed in the (Phase II) RI.**

Action: **Additional groundwater monitoring wells will be installed downgradient of the Solid Waste Landfill during the (Phase II) RI.**

340. Commenting Organization: OEPA Commentor:
Section #:2.3.1 Pg. #:2-40 Line #: Code:
Original Comment # 9
Comment: This section must reference the fact that these waste units have been designated as RCRA units.

Response: **Agreed.**

Action: **This sentence will be inserted at the end of Section 2.3.1, "The North Lime Sludge Pond has been designated a RCRA Hazardous Waste Management Unit (HWMU)."**

341. Commenting Organization: OEPA Commentor:
Section #:2.5.2 Pg. #:2-55 Line #:41 Code:
Original Comment # 10
Comment: Figure 2-14 is incorrectly referenced. The correct reference is Figure 2-15.

Response: **Agreed.**

Action: **The text will be revised to reference Figure 2-15.**

342. Commenting Organization: OEPA Commentor:
Section #:2.6.2 Pg. #: 2-64 Line #: Code:
Original Comment # 11

Comment: The section fails to discuss surface soil samples collected within and adjacent to the South Field boundary (e.g., 1046, 1516, 1517, 05001, See Figure 2-65). These samples should be discussed within the section.

Response: **Agreed.**

Action: **This sentence will be inserted at the end of Section 2.6.2, "During the RI/FS, one surface media sample was collected for radionuclide analysis from the northeast area of the South Field (05001)." Locations 1046, 1516, 1517, and 1518 are subsurface sample locations that were erroneously placed on Figure 2-19. These points will be deleted.**

343. Commenting Organization: OEPA Commentor:
Section #: Pg. #: 3-69 Line #:13-15 Code:
Original Comment # 12
Comment: The detailed description of the slug tests should be discussed here in the RI, not simply referenced.

Response: **Agreed.**

Action: **A more detailed description of the hydraulics of the hydrostratigraphic units will be included in the revised (Phase II) RI Report.**

344. Commenting Organization: OEPA Commentor:
Section #: Pg. #: P3-69 Line #: 13-15 Code:
Original Comment # 13
Comment: DOE should discuss what measures were taken to determine if the permeable zones in the till are interconnected.

Response: **Agreed.**

Action: **See action for Comment/Response No. 343.**

345. Commenting Organization: OEPA Commentor:
Section #: Pg. #:P4-1 Line #: 17-19 Code:
Original Comment # 14
Comment: All data used in the RI/FS must be validated and meet all criteria set in the RI/FS work plan. It is not possible for Ohio EPA to review each item of data to determine its usability; that is why the RI/FS work plan was created.

Response: **Agreed.**

Action: **All data used in the RI will be labeled with a validation qualifier.**

346. Commenting Organization: OEPA Commentor:
Section #:Table 4-1 Pg. #: 4-3 Line #: Code:
Original Comment # 15

Comment: a) As stated in the general comments above, the use of the inorganic background values defined in this table is unacceptable to Ohio EPA. The fact that a number of the "background" inorganic concentrations exceed their respective MCLs calls into question the database. b) Footnote "g" states that the value is assumed based upon the lowest background value from other groundwater units. If this is true then the lowest value was probably a non-detect for some constituents and thus non-detect should be the background value. c) The use of regional values for the determination of background inorganic soil concentrations is not warranted in light of the substantial sampling program implemented by DOE. DOE should use site specific data for the determination of background values.

Response: **A site-wide background water quality document is in preparation by OU-5.**

Action: **Data from the site-wide report will be used in the revised (Phase II) RI Report.**

347. Commenting Organization: OEPA Commentor:
Section #: Table 4-5 Pg. #:4-21 Line #: Code:
Original Comment # 16
Comment: Tetrachloroethene: It is unclear how a range of 0.030-0.097 was obtain when the contaminant was detected in only one sample. The table needs to be corrected.

Response: **Additional samples are proposed for organic analyses in the Phase II scope of work. The correct range of detected values will be used in the revised (Phase II) RI Report.**

Action: **The correct range of values will be used in the revised (Phase II) RI Report.**

348. Commenting Organization: OEPA Commentor:
Section #: Pg. #:P4-6 Line #:9-15 Code:
Original Comment # 17
Comment: This is an oversimplification of a potentially complex system. Simply because a contaminant is found above background in ground water and not above background in the overlying soil does not in any way indicate that it had to come from an upgradient source. It is quite possible that the contaminant may be originating from a different part of the same unit.

DOE cannot simply ignore the presence of the ground water contaminant and waive further investigation to the OU5 RI. It is DOE's responsibility to fully investigate and define any ground water contamination in regards to OU2. If additional investigation gives technical justification for assigning an upgradient source other than OU2, then the source must be identified and investigated in the OU5 RI/FS.

Response: **Agreed.**

Action: **Additional wells and data evaluation are proposed as part of a Phase II investigation.**

349. Commenting Organization: OEPA Commentor:

Section #: Table 4-11 Pg. #:4-42 Line #: Code:
Original Comment # 18
Comment: Locations 23-012 and 23-013 are footnoted with an "a", yet both locations lie within the south lime sludge pond (See Figure 4-7). Please correct the table.

Response: **Agreed.**

Action: **The table will be corrected.**

350. Commenting Organization: OEPA Commentor:
Section #: Pg. #:P4-29 Line #: 5-6 Code:
Original Comment # 19
Comment: What is DOE's assessment of the presence of secondary permeability due to the weathering of clay till? What evidence shows that secondary permeability does not provide a pathway to the underlying sand and gravel aquifer?

Response: **The possibility exists that macro-pores, fractures or decayed root channels may exist within the till underlying OU 2 waste units. We believe the relevant problem is to determine the location of the waste materials, particularly those that are in fill materials that overlie thin to non-existent till.**

Action: **None proposed.**

351. Commenting Organization: OEPA Commentor:
Section #: Pg. #: P4-29 Line #: 15-18 Code:
Original Comment # 20
Comment: Why were not all monitoring wells sampled for the same parameters? One of the purposes of an RI/FS is to provide a broad data base for comparison. Although radionucleides are a prevalent contaminant at Fernald, the RI/FS is designed to look at all contaminants. As a result, it is not desirable to pick and choose certain wells which are to be sampled for select parameters.

Response: **Agreed.**

Action: **Additional sampling is proposed for all of the wells within the OU 2 waste units.**

352. Commenting Organization: OEPA Commentor:
Section #: Pg. #: 4-29 Line #:22 Code:
Original Comment # 21
Comment: DOE switches between the use of Picocurries per liter and parts per billion. A single unit should be used throughout the document.

Response: **Different radioisotope analyses produce differing values, total uranium is reported in concentrations while isotopes are reported in activities. There should be interchangeability between the units since all radioactive elements contain equilibrium activity ratios for their component isotopes. The determining factor in selecting the units appears to be regulatory limits.**

Action: **Unless directed otherwise, units reported by the lab for the analytical methods will be presented in the revised (Phase II) RI Report. Any unit conversions will be noted and referenced in the tables.**

353. Commenting Organization: OEPA Commentor:
Section #: Pg. #: P4-29 Line #: 21-27 Code:
Original Comment # 22
Comment: DOE has not included figures illustrating ground water flow based upon the quarterly Phase II RI Report sampling events. Additionally, the text does not include a technical discussion of ground water flow gradients or directions. As a result, it is impossible to evaluate MW 2052's adequacy as an upgradient monitoring well.

Response: **Agreed. The same comment was received from the US EPA.**

Action: **The revised (Phase II) RI Report will contain an expanded discussion of the hydrostratigraphic features.**

354. Commenting Organization: OEPA Commentor:
Section #: Pg. #: 4-29 Line #: 26-27 Code:
Original Comment # 23
Comment: DOE will have to include a thorough technical justification for this hypothesis. The limited discussion in this section is not adequate.

Response: **A similar comment was received from the US EPA concerning the assumption of source area up-gradient of the SWL. We propose to revisit this statement and revise or eliminate it as needed base upon a rigorous examination of seasonal groundwater gradients and stratigraphic correlation in the wells.**

Action: **The revised (Phase II) RI Report will provide an improved discussion of groundwater flow directions near to the SWL.**

355. Commenting Organization: OEPA Commentor:
Section #: Pg. #: 4-29 Line #: 34-36 Code:
Original Comment # 24
Comment: Why was the RI work plan not followed for these samples?

Response: **The CIS and ES groundwater samples were not sampled according to the same methods as the RI samples since they were collected before the QAPP was completed.**

Action: **A concise discussion of the methods for all sampling will be presented in a table to provide the reader easy understanding of the comparability of results. Comparing filtered and non-filtered samples from different sampling events will probably not be possible.**

356. Commenting Organization: OEPA Commentor:
Section #: Pg. #: 4-29 Line #: 21-27 Code:

Original Comment # 25
Comment: Figures with: Unit delineation, ground water flow, and monitoring well placement should be included for all monitored units in OU2.

Response: **Agreed.**

Action: **Additional documentation, including seasonal groundwater gradient maps and hydrographs, will be used in the revised (Phase II) RI Report to improve understanding of the flow systems.**

357. Commenting Organization: OEPA Commentor:
Section #: Pg. #: 4-35 Line #: 2-8 Code:
Original Comment # 26
Comment: Specifically, where were these contaminants found? What is the rate and extent of the ground water contamination?

Response: **The organic contaminants referenced are typical laboratory contaminants, although this possibility is not explored in the present (Phase II) RI Report text. Metals concentrations are compared to a background value, which, as of February 1993, is still in the process of being determined on a site-wide basis.**

Action: **The revised (Phase II) RI Report will access a larger data base for groundwater data, namely the available RCRA data, sample data from additional wells proposed for construction at the SWL and from a complete set of chemical data from another round of sampling.**

358. Commenting Organization: OEPA Commentor:
Section #: Pg. #: 4-52 Line #: 9-13 Code:
Original Comment # 27
Comment: See comment 20.

Response: **See Comment/Response to No. 1. The reason why Well 2042 was not consistently sampled is not known.**

Action: **Additional sampling is planned for the complete set of wells at the Lime Sludge Ponds during the proposed (Phase II) work. Additional data is available from RCRA sampling activities.**

359. Commenting Organization: OEPA Commentor:
Section #: Pg. #: 4-52 Line #: 16-23 Code:
Original Comment # 28
Comment: This section completely lacks any discussion of hydrogeology. Technical hydrogeologic justification must be provided to support an upgradient source.

Response: **See Comment/Response to No. 1. Agreed.**

Action: **Additional data evaluation is proposed for inclusion in the revised (Phase II) RI Report.**

360. Commenting Organization: OEPA Commentor:
Section #: Pg. #: P4-52 Line #: 26-29 Code:
Original Comment # 29
Comment: To what are these contaminants attributable?

Response: **The discussion of detected compounds in groundwater requires revision.**

Action: **The revised (Phase II) RI Report will present clarification of lab contaminants and will focus attention on actual detected compounds and constituents.**

361. Commenting Organization: OEPA Commentor:
Section #:4.3.5.3 Pg. #:4-52 Line #:32 Code:
Original Comment # 30
Comment: It is unclear whether chromium was "not consistently detected above background" or "not detected" (See 4.3.7) in groundwater. DOE needs to be more concise in its discussion of sampling results. Statements such as "not consistently detected above background" need to be eliminated and replaced with more specific summaries.

Response: **Agreed.**

Action: **The revised (Phase II) RI Report will relate tabulated data to background concentrations.**

362. Commenting Organization: OEPA Commentor:
Section #: Pg. #: 4-56 Line #: 2-4 Code:
Original Comment # 31
Comment: This statement cannot be made if all ground water samples were not analyzed for the complete list of parameters.

Response: **Agreed.**

Action: **A more complete data base will be available for discussion in the revised (Phase II) RI Report.**

363. Commenting Organization: OEPA Commentor:
Section #: Pg. # 4-56 Line #: 9-11 Code:
Original Comment # 32
Comment: The fate of contamination in these wells cannot be determined at this time. DOE has not presented any technical data addressing the vertical or horizontal migration of ground water in the till.

Response: **See Comment/Response No. 1. Agreed.**

Action: **Additional discussion is proposed to define the hydrogeological system in the till unit at the Lime Sludge Ponds. The migration of contaminants will be considered in relation to the hydrogeological model.**

364. Commenting Organization: OEPA Commentor:
Section #: Pg. #:4-69 Line #: 25-27 Code:
Original Comment # 33
Comment: DOE must present technical evidence that shows that the Active Flyash Pile is influenced by the South Field.

Response: **See Comment/Response No. 1. The groundwater gradients in the Upper Great Miami Aquifer appear to direct flow to the east under the South Field. This places the Active Flyash Pile in a generally down-gradient position relative to the South Field. The source for uranium contamination detected in the wells near to the Active Flyash Pile must therefore be identified.**

Action: **Additional hydrogeological discussion will be provided to define gradients and potential flow in the perched and regional aquifers in the area. Additional wells and sampling is proposed to define the full extent of contamination in the South Field/Active flyash area.**

365. Commenting Organization: OEPA Commentor:
Section #:Table 4-24 Pg. #:4-72 Line #: Code:
Original Comment # 34
Comment: The table should state whether the concentrations are in wet weight or dry weight of organism.

Response: **Agreed.**

Action: **The requested data will be determined from the standard method used for the analyses.**

366. Commenting Organization: OEPA Commentor:
Section #:4.5.4.3 Pg. #:4-90 Line #: Code:
Original Comment # 35
Comment: List all waste-related metals detected and their respective concentrations within this section.

Response: **Agreed.**

Action: **The text in the revised (Phase II) RI Report will be related to summary tables of the data.**

367. Commenting Organization: OEPA Commentor:
Section #: Pg. #:P4-90 Line #:28-32 Code:
Original Comment # 36
Comment: Why weren't all wells sampled for the complete list of parameters?

Response: **A complete set of analyses on the wells should be completed to enable interpretation of nature and extent of contamination. The sampling strategy appears to have been directed at identifying parameters of concern.**

Action: **Additional full parametric coverage is proposed for Phase II groundwater sampling at the Inactive Flyash Pile.**

368. Commenting Organization: OEPA Commentor:
Section #: Pg. #:P4-93 Line #:12-15 Code:
Original Comment # 37
Comment: This sentence is phrased such that it implies that 4016 is an example of more that one well with elevated metals concentrations. If more than one well showed elevated metals concentrations, then they should all be listed.

Response: **Agreed.**

Action: **The presentation of data in the revised (Phase II) RI Report will include text that concisely summarizes tabulated data.**

369. Commenting Organization: OEPA Commentor:
Section #: Pg. #:P4-93 Lines #:36-37 Code:
Original Comment # 38
Comment: If there is insufficient data to determine if the Inactive Flyash Landfill is a source of ground water contamination, then a phase II investigation should be implemented.

Response: **Agreed. A significant amount of usable data exist concerning the history of the waste disposal unit (aerial photos), on partially complete data on the hydrogeological system of the South Field, and incomplete data on the nature and extent of contamination.**

Action: **A Phase II PSP is being prepared to complete the understanding of the nature and extent of contamination, leading to an appropriate selection of a feasible remedial alternative.**

370. Commenting Organization: OEPA Commentor:
Section #:4.5.5.3 Pg. #:4-93 Lime #: Code:
Original Comment # 39
Comment: The section states, "Waste-related metals consistently detected in one or more wells above their applicable background concentration include cadmium in well 4016." This statement leaves the reader asking, What other waste-related metals are "included"?, Which waste-related metals were inconsistently detected? and In what other wells were these metals detected?. DOE should clarify the text to answer questions not raise additional concerns.

Response: **Agreed.**

Action: **A similar comment was addressed above, for original Comment No. 37. (See Comment/Response No. 368.)**

371. Commenting Organization: OEPA Commentor:
Section #: Pg. #:4-90 Line #:28-32 Code:

Original Comment # 40
Comment: Why weren't all wells sampled for the complete list of parameters?

Response: **This comment is similar to original Comment No. 36. (See Comment/Response No. 367.)**

Action: **See action for Comment/Response No. 367.**

372. Commenting Organization: OEPA Commentor:
Section #: Pg. #:4-93 Line #:12-15 Code:
Original Comment # 41
Comment: This sentence is phrased such that it implies that 4016 is an example of more that one well with elevated metals concentrations. If more than one well showed elevated metals concentrations, then they should all be listed.

Response: **This comment is similar to original Comment No. 37. (See Comment/Response No. 368.)**

Action: **See the action for Comment/Response No. 369.**

373. Commenting Organization: OEPA Commentor:
Section #: Pg. #:4-93 Line#: 36-37 Code:
Original Comment # 42
Comment: If there is insufficient data to determine if the inactive flyash landfill is a source of ground water contamination, then a phase II investigation should be implemented.

Response: **This comment is similar to original Comment No. 38. See Comment/Response No. 369.**

Action: **See the action for Comment/Response No. 369.**

374. Commenting Organization: OEPA Commentor:
Section #:4.5.7 Pg. #:4-96 Line #:9 Code:
Original Comment # 43
Comment: Clarify what DOE considers "consistently detected".

Response: **The term "consistently detected" is qualitative and will be deleted from the revised (Phase II) RI Report. In addition, the site-wide background water quality documentation is still being finalized.**

Action: **The discussion of detected constituents will reference tables and will be compared to the approved site-wide background determinations.**

375. Commenting Organization: OEPA Commentor:
Section #: Pg. #:4-96 Line #:11 Code:
Original Comment # 44
Comment: Change Great Miami Aquifer to Inactive Flyash Landfill.

Response: **Agreed.**

Action: **The text will be changed as requested.**

376. Commenting Organization: OEPA Commentor:
Section #: Table 4-37 Pg. #: 4-127 Line #: Code:
Original Comment # 45
Comment: Beryllium: The frequency above background should be 17/26 since the range all exceed background. Please correct the table.

Response: **The background concentrations for inorganics will be revised to agree with the background soil study approved for use at the site.**

Action: **Additional soil samples will be included in the database, and the calculation of the frequency of detection will include all validated data.**

377. Commenting Organization: OEPA Commentor:
Section #: 4.6.5.1 Pg. #: 4-140 Line #:20 Code:
Original Comment # 46
Comment: Correct "Rum" to "Run."

Response: **Agreed.**

Action: **The text will be revised.**

378. Commenting Organization: OEPA Commentor:
Section #: 4.6.5.3 Pg. #: 4-140 Line #: Code:
Original Comment # 47
Comment: DOE should clarify whether cadmium was the only waste-related metal detected or which other metals are "included."

Response: **Agreed.**

Action: **The discussion in the revised RI will be based upon tabulated data, and comparisons will be made between the concentrations of detected constituents and the accepted background water quality report.**

379. Commenting Organization: OEPA Commentor:
Section #: Pg. #: 4-144 Line #: 1-5 Code:
Original Comment # 48
Comment: A technical discussion of fate and transport of contaminants based upon existing data should be included prior to any fate and transport modeling.

Response: **Agreed. The location for this discussion is more appropriate in the presentation of modeling methods and assumptions.**

Action: **This dicussion will be presented in Section 5 of the revised (Phase II) RI Report.**

380. Commenting Organization: OEPA Commentor:
Section #: Figures 5-1 - 5-3 Pg. #: Line #: Code:
Original Comment # 49
Comment: Correct "Moss" to "Mass".

Response: **Agreed.**

Action: **The text will be corrected.**

381. Commenting Organization: OEPA Commentor:
Section #:Figure 5-3 Pg. #: Line #: Code:
Original Comment # 50
Comment: Include an arrow between Pb-212 and Bi-212.

Response: **Agreed.**

Action: **An arrow will be added between Pb-212 and Bi-212.**

382. Commenting Organization: OEPA Commentor:
Section #: Pg. #:5-16 Line #: 6-22 Code:
Original Comment # 51
Comment: Is DOE implying that surface water obtained from the lime sludge pond is capable of representing leachate for all of OU2? The wastes disposed of throughout OU2 are too variable to use this one sample as a representative example.

Response: **See Comment/Response No. 1. Comment noted.**

Action: **Additional waste unit specific characterization of surface water and leachate compositions will be performed during the OU 2 Phase II RI.**

383. Commenting Organization: OEPA Commentor:
Section #: Pg. #: 5-19 Line #: 4-14 Code:
Original Comment # 52
Comment: This method replaces actual measurement with modeling. This is a process which Ohio EPA has been encouraging DOE to discard. If there is not enough existing data to determine site specific leachate compositions, then phase II activities are warranted.

Response: **Agreed.**

Action: **Site-specific leachate compositions will be determined and utilized in the OU 2 Phase II RI.**

384. Commenting Organization: OEPA Commentor:
Section #: Pg. #:5-19 Line #:21-36 Code:
Original Comment # 53

Comment: If there is not enough existing data to determine site specific leachate compositions, then phase II activities are warranted.

Response: **Agreed.**

Action: **Site-specific leachate compositions will be determined and utilized in the OU 2 Phase II RI.**

385. Commenting Organization: OEPA Commentor:
Section #: Pg. #:5-21 Line #:1-19 Code:
Original Comment # 54
Comment: Is the HELP model able to interpret complex geology like that which is found in the till?

Response: **The use of the HELP model to simulate the complex geology can be justified by the conservative assumptions made in the conceptual model.**

Action: **The model assumptions will be discussed in more detail in the revised (Phase II) RI report.**

386. Commenting Organization: OEPA Commentor:
Section #: Pg. #:5-21 Line #:31-36 Code:
Original Comment # 55
Comment: Ohio EPA has identified many problems with the SWIFT II model as it has been used by DOE. DOE is currently taking action to fix some of these problems. As such, it is not suitable for use for the OU2 RI fate and transport modeling. Once the model input is corrected, then it can be used for this process.

Response: **A global groundwater model improvement task based on USEPA and OEPA comments is currently underway. However, the problems associated with the current groundwater model may not be critical to the type of model applications in the OU 2 RI report.**

Action: **Necessary justifications of the type of model applications in OU 2 RI using the current model and the needs of model sensitivity analyses will be determined for the revised (Phase II) RI Report.**

387. Commenting Organization: OEPA Commentor:
Section #:6.1.1 Pg. #: 6-3 Line #:6 Code:
Original Comment # 56
Comment: What basis did DOE specifically use for eliminating a contaminant based upon infrequency of detection? Was elimination based upon detections per media, sample location, well etc.? It would seem that based upon the limited number of samples available for each waste unit, that few if any contaminants could be eliminated based upon this criteria.

Response: **The rationale for selection of chemicals of concern will be revised for the revised (Phase II) RI Report, and will vary slightly from site to site. In general, most**

chemicals and radionuclides with available dose-response parameters should be retained as contaminants of potential concern. However, the final list will vary somewhat based on frequency of detection, the depth of detection, and whether the contaminant was detected in other media. While the general procedure will be the same for all sites in all OUs (e.g., if the upper 95% confidence limit exceeds the UCL or UTL background concentrations, that contaminant should be retained, and that basically all organics are retained), the final list will be modified slightly based on location, frequency, etc. All deletions from the list of CPCs will be clearly identified.

This procedure could, of course, result in an underestimation of risk by not addressing identified contaminants without dose-response parameters. However, if a contaminant is a major site contaminant, the EPA will be contacted for the appropriate parameter to use. In general, however, the risks are driven by a few contaminants, and the addition or deletion of a few contaminants with infrequent detections at low concentrations will not affect the final conclusions of the report.

Action: The revised (Phase II) RI Report will incorporate a more detailed discussion of the selection of chemicals of concern, as well as the uncertainties associated with this process.

388. Commenting Organization: OEPA Commentor:
Section #:Table 6-1 Pg. #:6-6 Line #: Code:
Original Comment # 57
Comment: The text should briefly clarify why no pathways are assessed on this page.

Response: This table is a master table that was developed for the Risk Assessment Work Plan, and none of the exposure routes presented on the second page apply to OU 2.

Action: This table in the revised (Phase II) RI Report will be revised to include only those media/exposure route combinations that apply to OU2. The reader will be referred to the risk assessment work plan for all the exposure routes that were initially considered to apply to the entire FEMP.

389. Commenting Organization: OEPA Commentor:
Section #:Tables 6-3, 5, 7, 9, & 11 Pg. #: Line #: Code:
Original Comment # 58
Comment: DOE must add the risks by scenario.

Response: Agreed.

Action: Total risks will be provided by exposure scenario. Risks will be presented separately for radionuclides and organic/inorganic contaminants. This information will be included in the revised (Phase II) RI Report.

390. Commenting Organization: OEPA Commentor:
Section #: 6-4, 6, 8, 10, & 12 Pg. #: Line#: Code:
Original Comment # 59

Comment: Hazard Indices must be added by target organ.

Response: While it is true that the EPA guidance indicates that Hazard Indices should be added by target organ effect, in reality this is only important if the total Hazard Index exceeds unity. If the total Hazard Index is below unity or if individual chemicals have Hazard Quotients greater than unity, this discussion becomes less important in that toxic effects are either clearly not indicated or are clearly indicated, respectively. Presenting all Hazard Indices for all scenarios by target organ would tend to obscure the already overwhelming amount of information presented in the report.

Action: In cases where the total Hazard Index exceeds unity, the particular target organ and mechanism of action will be discussed briefly in the text.

391. Commenting Organization: OEPA Commentor:
Section #:7.1.3 Pg. #:7-3 Line #:20-21 Code:
Original Comment # 60
Comment: This statement is should be removed. Risk levels elevated above the $1X^{10-6}$ point of departure were associated with the scenarios. Additionally, the risks from the pathways were not summed to reflect the total risk associated with each scenario.

Response: Risks will be recalculated based on new data to be collected. Risks will also be totalled for each scenario as requested in comments on the risk assessment. Having risks below 10^{-4} does not exclude that area from remedial action given the overall risk goal of 10^{-4} for the entire site.

Action: The text will be revised to indicate when risks are $>10^{-6}$ (the point of departure) and when they are $>10^{-4}$.

392. Commenting Organization: OEPA Commentor:
Section #:7.2.3 Pg. #:7-5 Line #:1-2 Code:
Original Comment # 61
Comment: This statement is should be removed. Risk levels elevated above the $1X^{10-6}$ point of departure were associated with Scenario 3. Additionally, the risks from the pathways were not summed to reflect the total risk associated with each scenario.

Response: See Comment/Response No. 391.

Action: See action for Comment/Response No. 391.

393. Commenting Organization: OEPA Commentor:
Section #:7.3.3 Pg. #:7-6 Line #:10-11 Code:
Original Comment # 62
Comment: This statement is should be removed. Risk levels elevated above the $1X^{10-6}$ point of departure were associated with Scenario 3. Additionally, the risks from the pathways were not summed to reflect the total risk associated with each scenario.

Response: See Comment/Response No. 391.

Action: **See action for Comment/Response No. 391.**

394. Commenting Organization: OEPA Commentor:
Section #:7.4.3 Pg. #:7.7 Line #:30-31 Code:
Original Comment # 63
Comment: This statement is should be removed. Risk levels elevated above the $1X^{10-6}$ point of departure were associated with the scenarios. Additionally, the risks from the pathways were not summed to reflect each total risk associated with the scenario.

Response: **See Comment/Response No. 391.**

Action: **See action for Comment/Response No. 391.**

395. Commenting Organization: OEPA Commentor:
Section #:7.5.3 Pg. #:7-9 Line #: 13-14 Code:
Original Comment # 64
Comment: This statement is should be removed. Risk levels elevated above the $1X^{10-6}$ point of departure were associated with the scenarios and other contaminants. Additionally, the risks from the pathways were not summed to reflect the total risk associated with each scenario.

Response: **See Comment/Response No. 391.**

Action: **See action for Comment/Response No. 391.**

396. Commenting Organization: OEPA Commentor:
Section #:A.2.1.1.2 Pg. #:A-2-3 Line #:25-27 Code:
Original Comment # 65
Comment: The use of regional values for the determination of background inorganic soil concentrations is unacceptable. DOE should use site specific data for the determination of background values. The fact that these chemicals were not detected during the sampling does not justify the use of regional data. Additionally, the detection limits from the site specific sampling were significantly less than the regional values chosen. The site specific background for these chemicals is obviously less than the detection limit of the samples, and thus any detections during waste characterization are above background.

Response: **All contaminants of potential concern will be reevaluated when agreement is reached with the U.S. EPA whether to use the UCL or the UTL for the background sample concentrations. At that time, the final list of metals may also change. Currently, the selection process for the four metals for which regional background data are used resulted in the retention of one or more metals under the current procedure. Both the USEPA and the OEPA have commented on the use of regional data.**

Action: **This comment will require a further evaluation (of detection limits used in the background soil sampling program compared to the regional data) to determine**

whether any or all of the four metals of concern should be retained as contaminants of potential concern.

397. Commenting Organization: OEPA Commentor:
Section #:A.2.1.3.1 Pg. #:A-2-14 Line #:11-14 Code:
Original Comment # 66
Comment: It is unclear whether the third sentence(lines 11-13) in the paragraph is describing a criteria separate from the fourth sentence (lines 13-14). Please clarify and provide an example.

Response: **Agreed.**

Action: **This section will be rewritten in the revised (Phase II) RI Report to clarify the contaminants of potential concern selection process. In general, the process followed will be that outlined in the Risk Assessment Work Plan.**

398. Commenting Organization: OEPA Commentor:
Section #:Tables A.2-4 Pg. #:A-2-23 Line #: Code:
Original Comment # 67
Comment: a) Why are no organics, such as dioxins included in the table? b) The footnotes are not referenced within the table. Please correct.

Response: **a) No organics are included because, as the text indicates, none were found at predicted air concentrations that were high enough to exceed any MAGLCs. The metals were the contaminants that were found at the highest concentrations and these were, as the table shows, several orders of magnitude below the MAGLCs. b) Comment noted.**

Action: **The revised (Phase II) RI Report will utilize RBK-based exposure criteria for the inhalation pathway. The footnote indicators (a and b) will be added to the proper columns of information.**

399. Commenting Organization: OEPA Commentor:
Section #:A.3-1 Pg. #:A-3-2 Line #: Code:
Original Comment # 68
Comment: Pu-238: This seems to be the only contaminant for which the mean exceeds the range. Is this an error or the effect of high detection limits?

Response: **Comment noted. The source of this anomaly will be determined.**

Action: **All data in all tables will be checked including additional surface soil, subsurface soil, groundwater, surface water, and sediment data to be collected in the Phase II field investigation.**

400. Commenting Organization: OEPA Commentor:
Section #:Table A.3-1 Pg. #:A-3-2 Line #: Code:
Original Comment # 69

Comment: Nickel: Screening based upon the UCL < UTL is only acceptable if there is only one detection above the UTL (See Manganese). Please clarify justification for screening. Was only one detection above background UTL?

Response: **Comment noted. However, even if more than one detection exceeds the background value, it is still acceptable to eliminate an analyte from further consideration if the UCL is less than the background UTL (or UCL, based on future discussions with the USEPA).**

Action: **In the revised (Phase II) RI Report, the process used to determine contaminants of potential concern will be described in additional detail, and will include references to the Risk Assessment Work Plan, where appropriate.**

401. Commenting Organization: OEPA Commentor:
Section #:Table A.3-1 Pg. #:A-3-6 Line #: Code:
Original Comment # 70
Comment: Zinc: Sample concentrations do exceed background. Exclusion can not be based on "concentrations within background levels."

Response: **Comment noted. See Comment/Response No. 400.**

Action: **This table will be modified in the revised (Phase II) RI Report.**

402. Commenting Organization: OEPA Commentor:
Section #:A.3-1 Pg. #:A-3-7 Line #: Code:
Original Comment # 71
Comment: footnote "g": The UTL for these chemicals should be calculated with one-half the detection limit and the detected result. Why is DOE using the detection as the UTL? It is possible that the detection is an outlier. Additionally, footnote "g" is not referenced within the table. Please clarify.

Response: **Footnote "g" was not actually applied in any of the tables in which it appears. What was done in this table and all others like it was to create a generic set of footnotes so that footnote "a" on all similar tables stands for the same information. Otherwise, DOE agrees.**

Action: **The background UTL or UCL concentration will be calculated using one-half the sample-specific detection limits, as is done for the on-site data. The revised (Phase II) RI Report will also include a generic set of footnotes for each type of table to aid the reader in going from table to table.**

403. Commenting Organization: OEPA Commentor:
Section #:Table A.3-1 Pg. #:A.3-7 Line #: Code:
Original Comment # 72
Comment: footnote "j": The use of this footnote is not justified. Since no contaminant was analyzed for more than 20 times, it is not possible to have a less than 5% frequency of detection (1/20). The use of this screening criteria is inappropriate and should be deleted.

Response: **Agreed.**

Action: **The CPC selection tables in the revised (Phase II) RI Report will be modified to incorporate this comment on selection criteria.**

404. Commenting Organization: OEPA Commentor:
Section #:Table A.3-1 Pg. #:A-3-7 Line #: Code:
Original Comment # 73
Comment: footnote "o": The detection limits for these chemicals were not elevated and were significantly less than the regional values chosen as background UTLs. Positive detections of these contaminants should result in their being selected as constituents of concern.

Response: **Two of the three chemicals using this footnote were retained as contaminants of potential concern. The third (selenium) was only detected in 1 of 16 samples at a concentration of 0.54 mg/kg. However, it is quite likely that the sample sets for these and other metals may change based on the proposed additional sampling.**

Action: **The detection limits used in the background soil sampling program will be evaluated and the list of CPCs will be modified accordingly in the revised (Phase II) RI Report.**

405. Commenting Organization: OEPA Commentor:
Section #:Table A.3-7 Pg. #:A-3-22 Line #: Code:
Original Comment # 74
Comment: See previous comments on Table A.3-1.

Response: **See Comment/Response Nos. 399-404.**

Action: **See actions to Comment/Response Nos. 399-404.**

406. Commenting Organization: OEPA Commentor:
Section #:Table A.3-14 Pg. #:A-3-37 Line #: Code:
Original Comment # 75
Comment: a) See previous comments on Table A.3-1 b) Silver, Vanadium: Sample concentrations do exceed background. Exclusion can not be based on "concentrations within background levels."

Response: **See Comment/Response Nos. 399-404.**

Action: **See actions to Comment/Response Nos. 399-404.**

407. Commenting Organization: OEPA Commentor:
Section #:Table A.3-19 Pg. #:A-3-37 Line #: Code:
Original Comment # 76

Comment: a) See previous comments on Table A.3-1 b) Silver: Sample concentrations do exceed background. Exclusion can not be based on "concentrations within background levels."

Response: **See Comment/Response Nos. 399-404.**

Action: **See actions to Comment/Response Nos. 399-404.**

408. Commenting Organization: OEPA Commentor:
Section #:Table A.3-26 Pg. #:A-3-63 Line #: Code:
Original Comment # 77
Comment: a) See previous comments on Table A.3-1 b) Barium, Cobalt, Copper, Cyanide, Nickel: Sample concentrations do exceed background. Exclusion can not be based on "concentrations within background levels."

Response: **See Comment/Response Nos. 399-404.**

Action: **See actions to Comment/Response Nos. 399-404.**

409. Commenting Organization: OEPA Commentor:
Section #:Table A.I.1 Pg. #:A-I-1 Line #: Code:
Original Comment # 78
Comment: footnote "e": The UTL for these chemicals should be calculated with one-half the detection limit for non-detect samples and the detected result. Why is DOE using the detection as the UTL? It is possible that the detection is an outlier.

Response: **See Comment/Response No. 402.**

Action: **See action to Comment/Response No. 402.**

410. Commenting Organization: OEPA Commentor:
Section #: 2.2.5 Pg. #: 2-35 Line #: 23
Code:
Original Comment # 79
Comment: These analytical results will help fulfill the objectives of the groundwater sampling. Will these results be available for incorporation in the next OU-2 RI report revision?

Response: **Results from Well 1719 and the landfill trenching groundwater are available but not validated yet.**

Action: **The validated results will be included in the revised (Phase II) RI Report.**

411. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 3.6.2 Pg. #: 3-63 & 3-69 Line #: 41 & 1 Code: C
Original Comment # 80
Comment: The extent of the area lacking overburden deposits along Paddys run is not adequately described here.

Response: **Agreed.**

Action: **A discussion of the extent of the till will be included in the revised (Phase II) RI report.**

412. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.1.2 Pg. #: 4-2 Line #: Code: C
Original Comment # 81
Comment: Can DOE provide documentation of the sample locations and analytical results relied upon to calculate the UTLs and statistics provided in Table 4-1 and Appendix A, respectively, either as an appendix to this report or in a separate submission? Can the data (sample station coordinates and analytical results) also be provided on disk?

Response: **Quantitative determination of background concentrations for soil is included in the CERCLA/RCRA Background Soil Study (see Comment/Response No. 115 for full reference). Background water and surface water characterization is the subject of a separate study currently underway (see Comment/Response No. 329).**

Action: **Approved background values will be used as a basis of comparison in the revised (Phase II) RI Report.**

413. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.1.2, Table 4-1 Pg. #: 4-3, 4, 5 Line #: Code: C
Original Comment # 82
Comment: Can sample quantification limits (SQLs) be included in Table 4-1?

Response: **Agreed.**

Action: **These data will be provided in the background reports referenced in Comment/Response No. 412.**

414. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.2.3.1 Pg. #: 4-10 Line #:
Code: C
Original Comment # 83
Comment: Results from test pit #8 should be included in this section.

Response: **Because the location of Test Pit #8 was not surveyed, the exact sample locations cannot be determined. Therefore, the analytical results can be used only as a general indicator of potential contamination in the northwest corner of the landfill area.**

Action: **None proposed.**

415. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.2.5.1 Pg. #: 4-29 Line #: 26 Code: C
Original Comment # 84

Comment: Figure 3-11 on page 3-21 does not support this conclusion (note U concentrations shown). A groundwater elevation map for the solid waste landfill area should be provided to support this statement.

Response: **Comment noted.**

Action: **An alternate figure will be provided in the revised (Phase II) RI Report that shows the area of the SWL on a smaller scale. Seasonal gradients will be discussed and the proposed up-gradient and down-gradient locations will be justified. Additional groundwater wells are proposed to supplement the existing data as needed.**

416. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.2.5.3 Pg. #: 4-35 Line #: 7 Code: C
Original Comment # 85
Comment: The range of concentrations of molybdenum detection should be included here.

Response: **Agreed. The discussion of metals detected in groundwater is qualitative.**

Action: **The discussion of detected constituents will be related to tabulated data and compared to the approved background concentrations in the revised (Phase II) RI Report.**

417. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.2.7 Pg. #: 4-35 Line #: 35 Code: C
Original Comment # 86
Comment: This sentence is somewhat inconsistent with Section 4.2.5.1, line 26. A groundwater elevation map for the solid waste landfill should be provided to clarify this statement.

Response: **Agreed.**

Action: **A discussion of seasonal groundwater changes, including gradient maps, is proposed for the revised (Phase II) RI Report.**

418. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.3.3.1 Pg. #: 4-40 Line #: 26 Code: C
Original Comment # 87
Comment: With the exception of uranium results at 46-187, it appears from Figure 4-7, Table 4-10, and Table 4-11 that surface media immediately adjacent to the K-65 slurry line contains more uranium than media sampled elsewhere in the lime sludge ponds. Sample 46-187 may be related to another source other than the lime sludge ponds; note its proximity to the access road to the waste storage area.

Response: **See Comment/Response No. 1. Agreed.**

Action: **Additional sampling is proposed to determine the impact of the K-65 trench on soil contamination in the area.**

419. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.3.3.1 Pg. #: 4-40 Line #: 31 Code: C
Original Comment # 88
Comment: Figure 4-7 depicts four thorium analyses of surface media located in the lime sludge pond area not associated with the K-65 slurry line, not one as reported. While the areal distribution of data may be insufficient to completely demonstrate that surface media along the slurry line are more contaminated with thorium than surface media elsewhere in the lime sludge ponds, the thorium data collected do suggest that this is the case.

Response: **Agreed.**

Action: **Additional sampling is planned for the Phase II RI, with the impacts of the trench on soil contamination as an objective.**

420. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.3.3.1 Pg. #: 4-46 Line #: 1 Code: C
Original Comment # 89
Comment: The statement that minimal or no vertical migration of radionuclides has occurred should be qualified as the subsurface soil sample locations were not collected at locations of maximum surface media concentrations.

Response: **Agreed.**

Action: **Additional soil sampling, including trenching along the trench, is proposed to define migration of contaminants with depth.**

421. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.4.3.3 Pg. #: 4-66 Line #: 20 Code: E
Original Comment # 90
Comment: This sentence should read: "Concentrations of antimony in three..."

Response: **Agreed.**

Action: **The sentence will be revised.**

422. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.5.5 Pg. #: 4-90 Line #: 21 Code: C
Original Comment # 91
Comment: This section should state that based on the data presented, a definite conclusion can not be drawn as to whether the perched groundwater is in contact with the fill. This comment also applies to Section 4.6.5.

Response: **Agreed.**

Action: **Additional boring, penetrometry and well installation is proposed in the Phase II scope of work to define the existence and hydraulics of the perched groundwater in the Inactive Flyash Pile area.**

423. Commenting Organization: OEPA Commentor:
Section #: 4.5.5.1 Pg. #: 4-93 Line #: 1 Code: E
Original Comment # 92
Comment: At the top of the page in line 1, well 2046 has a concentration of 575 ug/l and at the bottom of the page well 2046 has a concentration of 576 ug/l. Response:

Response: **The concentration shown in Figure 4-14 is 574.7 pCi/l, while the concentrations shown in Table G-9 range from 309 to 907 pCi/l.**

Action: **The actual monthly data will be reported in the figure, and if averages are used in the text then they will be clearly defined as such in the text.**

424. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 4.6.5.1 Pg. #: 4-140 Line #: 10 Code: C
Original Comment # 93
Comment: Figure 4-20 or 3-71 should adequately demonstrate the 2000 series well groundwater elevation contours in order to support the statements in this section.

Response: **Agreed.**

Action: **Additional groundwater gradient maps will be presented in the revised (Phase II) RI Report to clearly indicate flow directions.**

425. Commenting Organization: OEPA Commentor:
Section #: 4.6.7 Pg. #: 4-142 Line#: 19 Code: C
Original Comment # 94
Comment: Why was well 2385 sampled only once? Are additional data now available?

Response: **Well 2385 was completed late in the field program, and there was time to collect and analyze only one round of samples.**

Action: **Additional groundwater samples are planned for collection in the South Field area, including Well 2385.**

426. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 5.0 Pg. #: 5-3 Line #: 26 Code: C
Original Comment # 95
Comment: What about mention of tritium? Although this is not one of the transuranics, has this been considered? Also technicium-99.

Response: **Comment noted.**

Action: **The text will be clarified regarding tritium and technicium.**

427. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 5.3.3.4 Pg. #: 5-20 Line #: 17 Code: E
Original Comment # 96
Comment: Change "mover of" to "mechanism by which"

Response: **Agreed.**

Action: **The text will be revised.**

428. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 5.4.1.3 Pg. #: Line #: Code: C
Original Comment # 97
Comment: Is it possible that vertical mixing is only on the order of a few feet or less thus questioning the vertical discretization used in the groundwater transport model. If the size of the grid blocks is significantly greater than the vertical mixing of the plume, the model will result in geometric mixing and underprediction of the level of the concentration. In other words, by applying relatively coarse vertical grids, the model will undercalculate the concentration level. Has this been sufficiently explored? In the regional model this was less of an issue as the scale of the transport plume was greater.

Response: **The corrected contaminant loading terms from ODAST and the measured vertical contaminant concentration profiles will be used to study the selection of the size of the vertical mixing zone. It is expected that the vertical resolution of the current groundwater model is sufficient to support the risk assessment.**

Action: **The size of the vertical mixing zone will be discussed in the revised (Phase II) RI Report text.**

429. Commenting Organization: OEPA Commentor: GeoTrans
Section #: 5.4.1.3 Pg. #: 5-26 Line #: 31 Code: E
Original Comment # 98
Comment: What uranium is presented in the contour plot? Is it U-238 or all isotopes added together. This should be more clear both in the text and the figures. Also what model layer is this? It appears to be the topmost layer.

Response: **Comment noted.**

Action: **The text of the revised (Phase II) RI Report will be clarified with regard to presentation of the results.**

430. Commenting Organization: OEPA Commentor: GeoTrans
Section #:6 and Appendix A Pg. #: Line #: Code: M
Original Comment #: 99
Comment: The estimated cancer risks were not summed by pathway for evaluating the risks from a chemical mixture throughout the report. The endpoint for potential cancer risks is the probability of contracting cancer; therefore, the individual probability estimates

should be summed. In addition, hazard quotients were not summed for each exposure pathway. According to guidance, the hazard quotients should be summed by pathway(s) or target organ (which is more accurate) for evaluating the total noncarcinogenic hazard associated with exposure to a chemical mixture (USEPA, 1989).

Response: **See Comment/Response Nos. 389 and 390.**

Action: **See actions to Comment/Response Nos. 389 and 390.**

431. Commenting Organization: OEPA Commentor:
Section #: 7.0 Pg. #:7-3/7-9 Line #: Code: C
Original Comment # 100
Comment: At the end of each O.U. 2 area the conclusion is made that,"in summary, no elevated risks are associated with the scenarios which assume access controls are maintained". However, this is only part of the assessment of risk and a sentance should be added that mentions the elevated risks associated with the potential loss of access controls.

Response: **Agreed.**

Action: **The text will be revised.**

432. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.1.4 Pg. #: A-1-9 Line #: 3-5 Code: M
Original Comment # 101
Comment: The use of the 95th upper confidence limit (UCL) on the geometric mean as the exposure point concentration (EPC) for small sample sizes does not appear to be appropriate and is not a method recommended in USEPA (1989) guidance. The use of the 95th UCL on the arithmetic mean as the EPC is based on general assumptions regarding the pathway (e.g., children may randomly contact different locations across the site over the duration of the exposure period) and not the distribution of the chemical. If it is not reasonable to estimate the 95th UCL on the arithmetic mean given the available data (i.e., high likelihood that the estimate will greatly exceed the maximum concentration), then the maximum concentration should be used as the EPC. In several cases, the maximum concentration exceeded the 95th UCL on the geometric mean by as an order of magnitude. Therefore, use of the maximum concentration in these cases may impact the ultimate risk estimates.

Response: **DOE acknowledges that the language in this section concerning calculation of the upper 95% confidence limit may be somewhat confusing. It is indeed appropriate to determine the arithmetic UCL, however, if the data set is log normally distributed, the data must be transformed and the arithmetic UCL calculated using the equation**

$$UCL = \exp(X + 0.5s^2 + sH/(\text{sqrt } n\text{-}1))$$

Where: X = mean of log-transformed data
s = standard deviation of the transformed data
H = H-statistic

n = number of samples

Calculations will be checked to verify the text.

When the distribution of the data set is normal, the following equation is used:

UCL = X + t(s/sqrt n)

Where: X = mean of untransformed data
s = standard deviation of untransformed data
t = Student's t-statistic
n = number of samples

When distribution cannot be determined with a 95% level of confidence, the larger of either the two UCLs or the maximum positive detection will be applied as the UCL concentration for risk assessment purposes. This is intended to eliminate the need for non-parametric tests to determine sample set distribution.

The test for distribution and these equations are presented in a recent OSWER Directive (9285.7-08, May 1992).

Action: The text will be revised to incorporate the information provided above regarding the substitution of the larger of the two arithmetic mean UCLs for sample sets whose distribution cannot be determined. Otherwise, the UCL on the appropriate distribution will be used as the exposure equation.

433. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.2.4 Pg. #: A-2-31 Line #: Code: M
Original Comment # 102
Comment: The fraction ingested (FI) exposure parameter value used for ingestion of soil under current land-use conditions and future land-use conditions with passive access controls was only 0.1. The Risk Assessment Work Plan calls for a FI value of 1 (DOE, 1992). Using the higher FI would ultimately increase the risks for this pathway by an order of magnitude.

Response: Comment noted.

Action: All calculations will be checked, and if necessary, reperformed using the correct FI (1.0) value.

434. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.2.4 Pg. #: A-2-33 Line #: Code: C
Original Comment # 103
Comment: The USEPA (1992) reference for the chemical-specific adsorption factors is not presented in the reference section. Is the reference "Dermal Exposure Assessment: Principles and Applications" (USEPA, 1992)?

Response: The reference made in this section of the table refers to factors that are routinely applied for large classes of chemicals to account for absorption through the skin

of contaminants found in soil. Values used in the calculations were presented in Table A.IV-2, with the sources of the information. This absorption is the intermedin transfer factors called ABS in the Risk Assessment Guidance for Superfund (EPA, December 1989). Chemical-specific absorption factors are presented in the Dermal Exposure Assessment guidance for dermal absorption of chemicals in water, and are called dermal permeability constants. These values are used when evaluating dermal exposures to water.

Action: **Sample calculations will be provided in the revised (Phase II) RI Report to indicate the use of all the specific input parameters for each exposure route.**

435. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.3.2 Pg. #: A-2-46 Line #: Code: C
Original Comment # 104
Comment: Toxicity criteria are not presented in IRIS or HEAST for lead. Why was the Integrated Uptake/Biokinetic Model not used for properly evaluating the potential risk from exposure to lead?

Response: **Agreed. It should be noted, however, that lead is not a major contaminant at any of the sites in OU 2. The maximum concentrations detected in the soil at these sites ranged from 2 mg/kg at the Lime Sludge Ponds to 1140 mg/kg in an area formerly used as a firing range at the South Field. In the case of the South Field, the UCL concentration was about 83 mg/kg. Other sites had maximum concentrations of lead less the 150 mg/kg. However, it is noted that the maxima could increase based on the results of the proposed field program. The existing values indicate that lead levels fall well within cleanup levels applied by several EPA regions of 500 mg/kg in residential areas to 1,000 mg/kg in industrial areas.**

The use of the UBK Model is unlikely to change the conclusions determined in the draft RI that lead is not a major cause of the risks at this site. It should also be noted that this model applies to small children under the age of 6 who are much more sensitive to lead in the environment. Most exposure routes considered do not include small children except under the future on-site resident scenario.

Action: **The baseline risk assessment will incorporate the Uptake/Biokinetic Model for lead exposures and dose-response data for lead will be removed from all tables. The latest version available at this time is Version 0.5, which is still in draft form. The results of the exercise will be a qualitative discussion of predicted blood lead levels in comparison to the standard for children (<10 μg/dL).**

436. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.3.2 Pg. #: A-2-47 Line #: Code: M
Original Comment # 105
Comment: A few errors were found in Table 1.2-10. IRIS reports a chronic oral RfD of 0.02 mg/kg/day for chlorobenzene and 0.1 mg/kg/day for ethylbenzene.

Response: **Agreed.**

Action: **All dose-response numbers will be referenced in the revised (Phase II) RI Report tables, and all numbers will be checked against those provided in IRIS or earlier published values, if not in IRIS.**

437. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.3.3.5 Pg. #: A-2-66 Line #: Code: M
Original Comment # 106
Comment: TEFs have been derived for other potentially carcinogenic PAHs which were not listed in Table A.2-11 including anthanthrene, benzo(e)pyrene, benzo(j)fluoranthene, benzo(g,h,i)perylene, cyclopentadieno(c,d)pyrene, and pyrene (ICF-Clement, 1988). Although some of these PAHs may not have been detected, pyrene was selected as a chemical of concern. Why were pyrene and potentially other carcinogenic PAHs not included in the carcinogenic assessment of PAHs as those listed in Table A.2-11.

Response: **IRIS and the USEPA consider pyrene as a class C carcinogen, and therefore have not calculated carcinogenic risks for pyrene. This table includes those B2 carcinogens that are on the Target Compound List, which are standard analytes.**

Action: **None proposed.**

438. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.2.4.2.1 Pg. #: A-2-68 Line #: Code: M
Original Comment # 107
Comment: In several instances, chemical-specific carcinogenic risks exceeded 10^{-2}. According to USEPA (1989) guidance, a modified cancer risk equation should be used when estimating cancer risks in excess of 10^{-2}.

$$\text{Cancer Risk} = 1 - e^{(-CDI*SF)}$$

Response: **Agreed.**

Action: **The text and calculations of the baseline risk assessment will be revised.**

439. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.5.1 Pg. #: A-5-1 Line #: 13 Code: C
Original Comment # 108
Comment: The chemical-specific risk to off-property residents/trespassing child under passive access control conditions exceeded 10^{-4} for Ra-226 at the South Field site. In addition, the total carcinogenic risk for the same pathway at the Inactive Flyash Pile approached 10^{-4}. Therefore, the sentence presented on line 13 should be changed. Insert the work "active" between "...assuming access..."; and insert "under current land-use conditions" between "...controls are...".

Response: **Agreed; however, the final risk numbers may change based on all the comments incorporated as well as the use of additional data to characterize various media.**

Action: **The text in the baseline risk assessment will be revised to include discussions of those receptor/exposure route combinations that result in risks greater than 10^{-4},**

where appropriate reference to specific tables on which the risk values are presented, will be provided.

440. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.5.1.2 Pg. #: A-5-2 Line #: 10-11 Code: C
Original Comment # 109
Comment: This statement is not accurate. The chemical-specific risk level for Ra-226 exceeded 10^{-6}, as well as the total risk for the chemical mixture.

Response: **Agreed. See Comment/Response No. 339.**

Action: **See action to Comment/Response No. 339.**

441. Commenting Organization: OEPA Commentor: Geotrans
Section #: A.5.1.3 Pg. #: A-5-2 Line #: 23-24 Code: C
Original Comment # 110
Comment: This statement is not accurate The estimated carcinogenic risks for several radionuclides exceeded 10^{-4} for future land-use pathways (see Table 6-7).

Response: **Agreed. See Comment/Response No. 339.**

Action: **See action to Comment Response No. 339.**

442. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.5.1.5 Pg. #: A-5-3 Line #: 17 Code: E
Original Comment # 111
Comment: Replace the phrase "with access controls" with "without access controls."

Response: **Agreed.**

Action: **Editorial changes will be made to reflect baseline risk assessment results.**

443. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.5.1.4 Pg. #: A-5-3 Line #: 3 Code: C
Original Comment # 112
Comment: It may be important to note that the total carcinogenic risk for the future land-use exposure pathway assuming passive access controls is slightly below 10^{-4} (i.e., 9.3×10^{-5}).

Response: **Agreed. See Comment/Response No. 339.**

Action: **See action to Comment/Response No. 339.**

444. Commenting Organization: OEPA Commentor: GeoTrans
Section #: A.5.2 Pg. #: A-5-4 Line #: 7 Code: C
Original Comment # 113

Comment: Provide a reference and more information on the 10^{-2} background cancer risk estimate mentioned in the text.

Response: **Comment noted.**

Action: **The reference will be provided or the sentence will be deleted from the revised (Phase II) RI Report.**

445. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.7.2 Pg. #: Line #: Code: M
Original Comment # 114
Comment: It would very useful to provide summary tables or plots of the mass in place. It is difficult to understand just how much of the material actually leaches, how much is in the vadose zone (sorbed and dissolved) and how much is within the groundwater flow system (sorbed and dissolved) and how much actually decayed. A semi-log plot might be useful here.

Response: **Comment noted.**

Action: **A discussion of mass balance of the contaminant in the model simulations will be presented in the revised (Phase II) RI Report.**

446. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.7.2 Pg. #: Line #: Code: M
Original Comment # 115
Comment: There should be some discussion or displays of the concentration level at different depths. It is difficult to understand and accept the areal contours without some indication of the vertical mixing. A vertical plot would be extremely useful.

Response: **Comment noted.**

Action: **Representative vertical profile of contaminant concentrations will be provided in the revised (Phase II) RI Report.**

447. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.2.2 Pg. #: B-49 Line #: 20-31 Code: M
Original Comment # 116
Comment: While the discussion regarding the possibility of transport through fractured media is appropriate, the validity of using equivalent porous media is understated. The modeling lacks supporting evidence, either direct or indirect, that EPM assumptions can be used for the till. This simplifying assumption is critical to all of the modeling. The subject deserve greater emphasis.

Response: **The use of the simple model to simulated the complex geology can be justified by the conservative assumptions made in the conceptual model.**

Action: **The model assumptions will be discussed in more detail in the revised (Phase II) RI Report.**

448. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.7.1 Pg. #: B-104 Line #: 19 Code: M
Original Comment # 117
Comment: How were the parameters varied? What determined acceptable recalibration? What were the final values? How did these vary from the regional model? What is the importance of these changes? Does this say something regarding the calibration efforts of the regional model? It seems that the local model was recalibrated with greater emphasis on matching the local monitor wells. Why not provide the statistics as was provided in the regional model calibration?

Response: **Comment noted.**

Action: **The development of the regional and local groundwater model will be described in detail in the Groundwater Modeling Report to be submitted in April, 1993.**

449. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.7.1 Pg. #: B-104 Line #: 9-30 Code: M
Original Comment # 118
Comment: There is no discussion of the perimeter boundary conditions. It must be assumed that the calibrated heads from the regional model were interpolated to for Dirichlet (prescribed heads value) boundary conditions. This should be more clearly stated as this has definite implications regarding the limitations of mesh refinement. For example, the local area model must be used with caution in modeling any additional sources/sinks at wells. Furthermore, the model can not be easily used to simulate transient groundwater flow.

Response: **See Comment/Response No. 448.**

Action: **See action to Comment/Response No. 448.**

450. Commenting Organization: OEPA Commentor: GeoTrans
Section #: B.3.7.2 Pg. #: B-105 Line #: 33-35 Code: M
Original Comment #119
Comment: How were the loading rates defined? Was the interpolation performed using the log of the concentration? Was there a check on the preservation of, i.e. the area under the curves? Could the approximation of the "spikes" to a uniform value for a specified period of time result in an additional numerical mixing and loss of artificial reduction in the calculated peak concentration?

Response: **Comment noted.**

Action: **The revised (Phase II) RI Report will clarify the use of the ODAST model and the source term determination process.**

ATTACHMENTS

TO

RESPONSE TO COMMENTS

ATTACHMENT A

INACTIVE FLYASH PILE

M. Well	List of Analytes						
	Radio-nuclide	Total Uranium	HSL Organic	HSL Inorg.	Cyanide	Gen. Water Quality	Organo-phos. Pest.
1016	3/88 2/89 12/89	3/88 2/89 12/89	3/88	3/88 2/89	3/88	3/88 2/89	2/89
1047	3/88 7/88 10/88 2/89 12/89	3/88 7/88 2/89 12/89		3/88 2/89		3/88 2/89	
2016	3/88 7/88 10/88 2/89 7/89 3/90	3/88 7/88 10/88 2/89 7/89 3/90	3/88	3/88 7/88 10/88 2/89 7/89 3/90	3/88	3/88 7/88 10/88 2/89 7/89 3/90	2/89
2047	2/89 5/89 7/89 3/90	2/89 5/89 7/89 3/90		2/89 5/89 7/89 3/90		2/89 5/89 7/89 3/90	
3016	3/88 7/88 10/88 2/89 3/90	3/88 7/88 10/88 2/89 3/90		3/88 7/88 10/88 2/89 3/90		3/88 7/88 10/88 2/89 3/90	
4016	2/89 5/89 12/89	2/89 5/89 12/89		2/89 5/89		2/89 5/89	

ATTACHMENT B

RI/FS SUBSURFACE SAMPLES - SOUTH FIELD

Boring Numbers	Shallow Fill (Depth in Feet)	Deep Fill (Depth in Feet)	Underlying Soil (Depth in Feet)	Composite
1046 - Within South Field boundary. Total depth 28.5 ft.	0-1.5. Radionuclides	15-16.5. Radionuclides		
1516 - Not within South Field boundary. Total depth 20 ft.	0-0.5; 1-1.5; 2-2.5; 3-3.5; 4-4.5; 6-6.5. Radionuclides, total uranium	8-8.5; 9-9.5; 10-10.5; 11-11.5; 12-12.5; 14-14.5. Radionuclides, total uranium.	15-15.5; 17-17.5; 18-18.5; 19-19.5. Radionuclides, total uranium.	TCLP herbicides, pesticides, SVOCS, VOCs, metals.
1517 - Not within South Field boundary. Total depth 20 ft.	0-0.5; 1.5-2; 3-3.5; 4.5-5; 6-6.5; 7-7.5. Radionuclides, total uranium	8-8.5; 9-9.5; 10-10.5; 12-12.5; 13-14. Radionuclides, total uranium	15-15.5; 16-17; 18-18.5; 19-19.5. Radionuclides, total uranium	
1518 - Not within South Field boundary. Total depth 20 ft.	0-0.5; 1-1.5; 2-2.5; 3-3.5; 4-4.5; 5-5.5; 6-6.5; 7-7.5. Radionuclides, total uranium	8-8.5; 9-9.5; 10-10.5; 11-11.5; 12-12.5; 13.5-14; 14.5-15. Radionuclides, total uranium	15.5-16; 16.5-17; 17.5-18; 18.5-19; 19.5-20. Radionuclides, total uranium	
1712 - Within South Field boundary. No boring log.	1.5-2. TCLP herbicides, pesticides, SVOCs, VOCs, metals. Ignitability, corrosivity, reactivity.			
1713 - Within South Field boundary. No boring log.	1.5-2. TCLP herbicides, pesticides, SVOCs, VOCs, metals. Ignitability, corrosivity, reactivity.			
1714 - Within South Field boundary. No boring log.	1.5-2. TCLP herbicides, pesticides, SVOCs, VOCs, metals. Ignitability, corrosivity, reactivity.			

1715 - Within South Field boundary. No boring log.	1.5-2. TCLP herbicides, pesticides, SVOCs, VOCs, metals. Ignitability, corrosivity, reactivity.			
1792 - Within South Field boundary. Total depth 34 ft.	0-1.5. VOCs. 1.5-3. Certain dioxin congeners, orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide. 6-7.5. Certain dioxin congeners, orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide.	12-13.5. Certain dioxin congeners, orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide. 16.5-18. Certain dioxin congeners, orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide.	21.5-23. Certain dioxin congeners, orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide. 28-29.5. TCLP herbicides, pesticides, SVOCs, VOCs, metals.	
1793 - Within South Field boundary. Total depth 15 ft.	3-4.5. Certain dioxin congeners, orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide.	6-7.5. TCLP herbicides, pesticides, SVOCs, VOCs, metals.		
1794 - Within South Field boundary. No boring log.	0-1. Certain dioxin congeners, orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide. 1.5-2. TCLP herbicides, pesticides, SVOCs, VOCs, metals. 2-2.5. Certain dioxin congeners, orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide.			

1795 - Within South Field boundary. No boring log.	0-1. Certain dioxin congeners, herbicides, orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide. 2-3. TCLP VOCs. 3-4. Certain dioxin congeners, orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide.			
2046 - Within South Field boundary. Total depth 73 ft.			30-31.5. Radionuclides, total uranium 61-62.5. Total uranium	
2385 - Not within South Field boundary. Total depth 71.5 ft.	4.5-6. Radionuclides, total uranium		45-46.5. Radionuclides, total uranium	
3046 - Within South Field boundary. Total depth 136.5 ft.			100-101.5. Radionuclides, total uranium ? Total uranium	
3385 - Not within South Field boundary. Total depth 136.5 ft.			80-81.5. Radionuclides, total uranium	

TEST PIT SAMPLE LOCATIONS RI/FS SUBSURFACE SAMPLES - SOUTH FIELD

Sample Numbers	Fill (Depth in Feet)	Native Soil (Depth in Feet)	(Depth in Feet)	
1455 - Test Pit 1	3 - Radionuclides, total uranium	3.75 - Radionuclides, total uranium		
1456 - Test Pit 1	3.75 - Radionuclides, total uranium. -3.75; Orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide.	4.25 - Radionuclides, total uranium		
1457 - Test Pit 1	3.75 - Radionuclides, total uranium	4.25 - Radionuclides, total uranium		
1458 - Test Pit 2	4 - Radionuclides, total uranium	4.5 - Radionuclides, total uranium		
1459 - Test Pit 2	5 - Radionuclides, total uranium. -5; Orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide.	6 - Radionuclides, total uranium		
1460 - Test Pit 2	3.5 - Radionuclides, total uranium	4.25 - Radionuclides, total uranium		
1461 - Test Pit 3	4 - Radionuclides, total uranium	5 - Radionuclides, total uranium		
1462 - Test Pit 3	4 - Radionuclides, total uranium. -4; Orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide.	5 - Radionuclides, total uranium		

1463 - Test Pit 3	3.5 - Radionuclides, total uranium	4.5 - Radionuclides, total uranium		
1464 - Test Pit 4	3.75 - Radionuclides, total uranium	4.5 - Radionuclides, total uranium		
1465 - Test Pit 4	3.5 - Radionuclides, total uranium -3.5; Pest/PCBs, SVOCs, VOCs, metals, cyanide.	4.5 - Radionuclides, total uranium		
1466 - Test Pit 4	3 - Radionuclides, total uranium	4.5 - Radionuclides, total uranium		
1467 - Test Pit 5	2.5 - Radionuclides, total uranium	3.5 - Radionuclides, total uranium		
1468 - Test Pit 5	2.5 - Radionuclides, total uranium -2.5; Orgphos. pest., pest/PCBs, SVOCs, VOCs, metals, cyanide.	3.5 - Radionuclides, total uranium		
1469 - Test Pit 5	2.5 - Radionuclides, total uranium	3.5 - Radionuclides, total uranium		
1470 - Test Pit 6	3 - Radionuclides, total uranium	4 - Radionuclides, total uranium		
1471 - Test Pit 6	4 - Radionuclides, total uranium. -4; Orgphos. pesticides	5.5 - Radionuclides, total uranium		
1472 - Test Pit 6	4 - Radionuclides, total uranium	5 - Radionuclides, total uranium		