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JUN 1 8 2007

Mr. James A. Saric, Remedial Project Manager
United States Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

EMCBC-00540-07

Mr. Thomas Schneider, Project Manager
Ohio Environmental Protection Agency
Southwest District Office
401 East Fifth Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF THE INTERIM RESIDUAL RISK ASSESSMENT REPORT FOR OPERABLE UNIT 5

References:
1) Letter J. Saric to J. Reising, "Interim Residual Risk Assessment," dated March 22, 2007
2) Letter, T. Schneider to J. Reising, "Comments – Interim Residual Risk Assessment Report for Operable Unit 5," dated May 15, 2007

Enclosed for your review are draft responses to comments pertaining to the Interim Residual Risk Assessment Report for Operable Unit 5. Comments were received from U.S. Environmental Protection Agency and Ohio Environmental Protection Agency on March 22, 2007 and May 15, 2007 respectfully. As we discussed, it may be appropriate to have a conference call or meeting prior to finalizing the document.

If you have any questions or require additional information, please contact me at (513) 648-3119.

Sincerely,

Johnny Reising

Johnny Reising
Director

Enclosures

cc w/enclosures:
T. Schneider, OEPA-Dayton (three copies of enclosures)
M. Cullerton, Tetra Tech
M. Shupe, HSI GeoTrans
S. Helmer, ODH
AR Coordinator, Wanda Sumner

cc w/o enclosures:
F. Johnston, Stoller
R. Norton, Fluor

RESPONSES TO THE OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE INTERIM RESIDUAL RISK ASSESSMENT REPORT FOR OPERABLE UNIT 5

FERNALD CLOSURE PROJECT
FERNALD, OHIO

JUNE 2007

U.S. DEPARTMENT OF ENERGY

RESPONSES TO OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE INTERIM RESIDUAL RISK ASSESSMETN REPORT FOR OPERABLE UNIT 5 (REVISION 0)

General Comments:

1. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: General Pg #: Line #: Code:
Original Comment #: 1
Comment: The CERCLA process considers an acceptable risk after a remediation to be in the range of one in ten thousand to one in a million. The text repeatedly uses such terms as 'complying with the CERCLA limit' or 'the risk values are well below the HQ compliance limit of one.'

The text should be re-written through out so that it is clear to the reader that the range of risks considered to be acceptable under CERCLA are not compliance limits.

Response: Agree.

Action: The text will be scrubbed to remove the terms complying and/or compliance when concluding the range in risk is acceptable under CERCLA.

Specific Comments:

2. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: 2.0 Pg #: 2-2 Line #: last partial paragraph Code: c
Original Comment #: 2
Comment: The text states, "Several of the chemicals...lack chemical toxicity and cancer morbidity data, and those constituents cannot be evaluated in the risk calculations...."

We agree with the statement in so far as the five cited constituents cannot be properly evaluated using the same methodology as the other site constituents. However, it is not appropriate to discount the the risk which these constituents pose. Text should be added to the appropriate sections which evaluate the risk using alternate methods. For example, the IEUBUK model is appropriate to estimate the risk of lead to children and the Toxicity Equivalence Factors can be applied to the chlorinated dibenzofuran.

Response: Agree. A cursory review of appropriate alternate methods for evaluating risk associated with most of these chemicals (e.g. lead, thallium, phenanthrene, tetrachlorodibenzo-p-dioxin) will be performed and incorporated into the text as appropriate. For example, the lead levels in this risk assessment were compared to the IEUBK example model. The default values for the IEUBK model for lead in children (200 mg/kg in soil and 10 ug/L in drinking water) produce an acceptable risk. As all exposure zones at the Fernald site have average soil and surface-water lead concentrations that are less than the IEUBK default values, the risk to children from lead at the site will be acceptable.

The citation in Section 2.0 for the dibenzofurans having no cancer morbidity data is incorrect, and the text will be corrected by removing them from the list. All dibenzofurans have cancer slope values and are evaluated for risk.

Action: Add text to Section 2.0 to note that the default values for the IEUBK model for lead in children (200 mg/kg in soil and 10 ug/L in drinking water) produce an acceptable risk. As all exposure zones have average soil and surface-water lead concentrations that are less than the IEUBK default values, the risk to children from lead at the site will be acceptable. Also,

include additional alternate methods for evaluating other chemicals that lack the toxicity and morbidity data, if available.

3. Commenting Organization: Ohio EPA Commenter:
Section #: 3.0 Pg #: 3-7 Line #: 3rd paragraph Code: C
Original Comment #: 3
Comment: "Please provide a reference or discussion for why the shielding factor for soil was chosen as 0.25. In addition, the uncertainty analysis should consider how sensitive the calculated risk is to the choice of the shielding factor 0.25.

Response: A shielding factor of 0.25 was used for external radiation emitted from soil because approximately 4 to 6 inches of mulch was worked into the top soil. This dilutes the remediated soil, and the mulch also attenuates the radiation emitted by residual contamination attached to the soil particles.

Action: The above language will be added to the text and an uncertainty analysis will be performed to determine the increase risk when the shielding factor is zero.

4. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: 3-1 and others Pg #: 3-3 Line #: 3rd and 5th bullets Code: C
Original Comment #: 4
Comment: The text under these bullets uses the phrase 'illegal wading'. Wading is not illegal, it just isn't allowed under the land use scenarios. We suggest using an alternate term such as 'unpermitted wading' or 'unallowed wading' or 'unsupervised wading'.

Response: Agree.

Action: Language on illegal wading will be changed to unpermitted wading

5. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: 4.1 Pg #: 4-1 Line #: last line in section Code: C
Original Comment #: 5
Comment: The text states, "For assessment of HWMU closure, all receptors are assumed to enter the HWMU zone." The sentence is not clear, re-write it.

Response: Agree.

Action: The sentence will be rewritten as "To assess the human health risk from exposure to the air, surface water and soil in the closed HWMUs, all receptors are assumed to enter the HWMU zone and receive a dose from all identified RCRA contaminants."

6. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: 4.3 Pg #: 4-2 Line #: last sentence cont'd to next page Code: C
Original Comment #: 6
Comment: The text describes how a conversion factor to estimate radon in air is calculated from the measured concentration of radium in soil. The conversion factor is the quotient of the 2005 average background radon concentration divided by the 95th percentile of the background soil concentration.

Justify the use of the 95th percentile of background instead of the average background. What other methods to estimate the incremental radon concentrations were considered? The uncertainty in the radon risk should be addressed in the uncertainty analysis.
last one reviewed

Response: The 95th percentile of the background soil concentration was used in the OU 5 CRARE to calculate background risk, and this approach is used in the IRRA to maintain comparability to CRARE results. Models for radon emission from the soil and air mixing were not used to estimate radon-222 concentrations, as there are many uncertainties in the use of such models and site specific monitoring data are available. Uncertainty in the radon risk will be evaluated by dividing the 2005 average radon-222 background concentration by the average background value for radium-226 in soil, which will increase the radon-222 conversion factor. A higher conversion factor will increase the radon-222 air concentration used in the uncertainty calculations for the air pathway.

Action: Justification will be added to the text and an uncertainty calculation will be performed to assess the increase in risk when using the average radium-226 concentration in soil to derive the radon conversion factor.

7. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: 4.4 Pg #: 4-3 Line #: last sent secd paragph Code: C
Original Comment #: 7
Comment: The text compares the risk due to background concentrations of radon-222 with the acceptable risks as allowed under CERCLA guidance. The point is made that the risk from background levels of radon-222 is of the same order of magnitude as an acceptable risk under CERCLA. This is an acceptable explanation of the risks but it leaves the mistaken impression that background must somehow comply with the CERCLA guidance.

Re-write the text to remove the discussion of the range of risks acceptable under CERCLA.

Response: Agree.

Action: The text will be changed to remove the confusion on background risk being acceptable under CERCLA.

8. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: 4.8 Pg #: 4-6 Line #: last line on page Code: C
Original Comment #: 8
Comment: The text states, "Therefore, by default, risk from the groundwater pathway is acceptable." This sentence needs to be removed.

Response: Agree.

Action: The sentence will be removed.

9. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: 5.0 Pg #: 5-3 Line #: last sentence Code: C
Original Comment #: 9
Comment: The text states that manganese is a COC in exposure Zones 3 and 5 only. However, manganese is a naturally-occurring element in all background soils in all zones, regardless of our designating it as a COC. The text should include a discussion (perhaps in the uncertainty analysis section) of why it is justifiable to ignore the contribution to the risk in some zones but not in others. The discussion should address how much the calculated risk is changed by ignoring the background manganese in some zones.

Response: Per the EPA & OEPA agreed to approach (December 2006 meetings), only the identified COCs in each certification report that comprises the exposure zones will be used, and manganese is a COC only in Zones 3 and 5. The basis for this decision is that including the

entire list of site-wide metal COCs in every exposure zone, at their background level, produces an unacceptable risk. Since background cannot be subtracted for metal COCs, adding these COCs to the risk calculation in zones where they are not applicable gives the mistaken impression that the site operations are responsible for the component of background risk.

Action: None.

10. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: 5.2 Pg #: 5-5 Line #: last 2 sent., last pargph cont'd to next pg Code: C
Original Comment #: 10
Comment: The text refers to Table 5.2 and compares the total ILCR to the background ILCR for Zones 6 and 7. The discussion states that the total risk is less than the background risk and explains this by implying that this result is expected because residual soil contamination was cleaned to below background. The discussion is counter-intuitive as most readers will not understand how a naturally-occurring substance can be remediated to below background. Re-write the discussion to explain how the total risk can be less than the background risk. Also, explain how it is possible to remediate soils to below background level. If necessary, the discussion should include how we determined background at Fernald.

Response: Agree.

Action: The discussion will be rewritten to define that background concentrations used in the risk calculations are the 95th percentile values, per the agreed to approach in previous risk assessments (e.g., the CRARE). As the 95th percentile is a good estimate of the maximum background value, remediation is likely to reduce the concentration of a COC in soil to a value below the estimate of the maximum. Therefore, remediation can reduce COC contamination in soil to levels below the 95th percentile of background.

11. Commenting Organization: Ohio EPA Commenter: OFFO
Section #: 6.0 Pg #: 6-3 Line #: Code: C
Original Comment #: 11
Comment: Additional discussion is needed in the text in regards to the elevated uranium concentrations in the pond west of former WP3. This issue is still on-going between the Agency's and DOE. Since this issue is not resolved, these specific pools (the text doesn't point out that there is more than one) containing elevated uranium concentrations will not only need to be monitored but possibly remediated. Further discussion is warranted here.

Response: Elevated uranium concentrations in the ponds west of former WP 3 were addressed by calculating the risk for the maximally exposed receptor (the groundskeeper/sampler) using the highest, and reproducible, uranium measurement available at the time. This maximum uranium concentration (890 ug/L) produced a risk that was acceptable for the groundskeeper/sampler and, by default, for the remaining receptors that have less exposure to the surface water. However, monitoring results received since the initial IRRA was released indicate a new maximum uranium concentration of 1600 ug/L. The new maximum will be used in the risk calculation to determine whether a uranium concentration of 1600 ug/L presents an unacceptable risk to the groundskeeper/sampler.

Action: As noted above.

12. Commenting Organization: Ohio EPA Commenter: OFFO
Section #: Appendix A Pg #: 1 of 1 Line #: Code: E
Original Comment #: 12
Comment: Please make the appropriate updates to the "Chronology of Soil Certification Reports" at the next revision of this document.

Response: Agree.

Action: Appendix A will be updated.

13. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: Appendix B Pg #: B-1 Line #: 2nd paragph Code: C
Original Comment #: 13
Comment: The paragraph is not clear. It should be split into two paragraphs dealing with the HWMU exposure zones and the other dealing with exposure zones 1 through 8. It should be obvious to the reader exactly which method was used to determine the concentrations input into the risk calculations.

Response: Agree.

Action: The text will be rewritten to address the HWMU zone and Exposure Zones 1 through 8 separately.

14. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: Tables B-1 Pg #: Line #: Code:
Original Comment #: 14
Comment: These tables lack sufficient headings to be clear. What are the values in the tables? Are they maximums, averages, 95% UCL on the mean? The last row of these tables is titled 'max value' but does not explain maximum of what?
The upper left hand corner of the table is headed HWMUs. Should this be CU?
For the HWMU data, a summary table should be created that ties together the HWMU name, the data from the CUs and the COCs used to assess risk. The reader should be able to determine exactly which COCs were used to evaluate the risk for each HWMU.

Response: The Table B-1 heading is Soil Certification Data, and each certification unit (CU) is tabulated in column one, with the corresponding COCs tabulated in successive columns. As noted in the Appendix B text, the COC values for each CU are taken from the certification reports and represent the 95% UCL of the mean (if statistical calculations were performed in the certification report) or the maximum value for the CU (if all values were below the FRL, no statistical calculations were performed). The last four rows of each table, "maximum value, average (used in risk calc), number of cert results, number of inserted values" are also explained in the Appendix B text. For example, maximum and average values represent the maximum and average observed for all CUs in the exposure zone. Table B-1 will be split into nine tables, as noted in the response to Comment 15.

The first column of the HWMU table will be split into two columns to identify the CU and the corresponding HWMU number. Each HWMU number will be tied to its name in a footnote to the table. COCs for each CU and HWMU are present in the table. As noted in the Appendix B text, all HWMUs are combined to form one HWMU exposure zone, and the maximum COC value, as obtained from all values reported for the HWMUs, is used in the

risk calculation. A summary of the COC values used in the risk calculations for the HWMU zone also appear on the calculation pages in Appendix E.

Action: As noted above.

15. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: Table B-1 Pg #: Line #: Code:
Original Comment #: 15
Comment: The last row is titled 'max value'. The reader has to go through multiple pages to glean the values used in the risk calculations. New tables should be created for each exposure zone showing exactly which values were used in the risk calculation for that zone.

Response: The Appendix B tables contain all back-up data to demonstrate how the values in the risk calculations (Appendix E) were derived, and the B-1 Table will be separated into 9 tables (Zones 1 through 8 and the HWMU zone) to provide greater clarity to the reader. A summary sheet will be provided for each table to show how the table is organized. Additionally, a summary of the COC values used in the risk calculations for each zone also appears on the calculation pages in Appendix E.

Action: As noted above.

16. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: Table B-2 Pg #: Line #: Code: e
Original Comment #: 16
Comment: The first column heading is "soil background for excavated areas". Why isn't the heading merely "soil background"? There was no study for soil background in excavated areas.

Response: Agree.

Action: The heading will be corrected to read 'soil background.'

17. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: Table B-1 Pg #: Line #: Code: E
Original Comment #: 17
Comment: The use of exponential notation is annoying in those cases where the value is actually an integer. For example, the last page of Table B-1 (B-1.198 of 198) has 'number of inserted values' as the heading of the last row. The table lists for xylenes '5.60E+01'. Why not just '56'?

Response: The use of scientific notation simplifies the formatting of the tables. It would take an inordinate amount of time to go through each table and change simple integers to number format.

Action: None.

18. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: Appendix C Pg #: C-3 Line #: 1st sent, 1st complete pargrph Code: C
Original Comment #: 18
Comment: The text states in part, "...the surface water list was modified to make it match the soil list." The sentence is not clear; it never states explicitly how the surface water list was modified.

Response: The explicit explanation of how the list was modified is explained in the next sentence, as noted in OEPA Comment 19, "When a contaminant is present in the surface water but not in the soil, it is dropped from the surface water pathway."

Action: None.

19. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: Appendix C Pg #: C-3 Line #: 2nd sentence, 1st para Code: C
Original Comment #: 19
Comment: The text states, "When a contaminant is present in the surface water but not in the soil, it is dropped from the surface water pathway". Justify why a detected constituent does not contribute to the risk. The paragraph later explains that default values were used to evaluate the surface water risk for those constituents for which no data is available. It is not clear how those default values were determined.

Response: COCs in surface water were limited to those in soil, as defined by the certification reports for a given exposure zone. The rationale for this is that if the COC is not of concern for the soil certification process, then it will not be present in the surface water at a concentration that poses a concern for human health. As noted in the last sentence of the paragraph, the default values used for COCs that are not in surface water, but that are present in soil, are the background values in Table C-3.

Action: As noted above.

20. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: Appendix C Pg #: Table C-2 Line #: Code:
Original Comment #: 20
Comment: We are looking for a table that gives the surface water concentrations chosen to represent the risk to the receptor in the HWMU exposure zone. Please provide.

Response: Agree.

Action: The summary table will be created and inserted in Appendix C.

21. Commenting Organization: Ohio EPA Commenter: RCRA
Section #: Appendix E Pg #: E-3 Line #: mid sent, last pargrph Code: E
Original Comment #: 21
Comment: We think that the word 'risk' was omitted and we believe the sentence should be re-written as follows; "Because of the new exposure parameters used, it was necessary to recalculate the background **risk** for the affected receptors."

Response: Agree.

Action: The word 'risk' will be added to the text.