Attachment B.

Responses to Colorado Department of Health Hazardous Materials & Waste Management Division Comments

Specific Comments

1 Comment

Vol I Appendix J Page ES-2 Are there any seeps on Walnut Creek within OU 6, and if so, is human exposure, either to ecological workers or open space receptors possible at these sites?

Response

Yes, seeps exist along the south flank of South Walnut Creek in the area east of the surface drainage gully Although the OU 6 work plan and subsequent addenda never directed OU6 to characterize these seeps, some seep investigation was undertaken during the OU 2 RFI/RI OU 6 surface water data and OU 2 groundwater data collected during the RFI/RI (1992) indicated that groundwater contaminant plumes have not yet migrated to the B-series ponds Occasional, sporadic detections of VOCs at low concentrations (less than 10 ppb) had been noted in the area, but nothing that would denote the leading edge of a contaminant plume In addition, groundwater solute transport modeling results reported by OU 2 indicated that the existing groundwater contaminant plumes have already approximately reached steady state conditions, and minimal further migration would be expected

During the time that the OU 2 and OU 6 draft RFI/RI reports were being prepared, further characterization of the seeps and alluvial groundwater upgradient of South Walnut Creek drainage (between the B-series ponds and the OU 2 East Trenches) was initiated by the DOE As reported in the draft *Strategic Plan for the Management and Remediation of Groundwater at the Rocky Flats Environmental Technology Site* (RMRS, 1995a), recent data indicate that the leading edge of a VOC groundwater plume from the OU 2 East Trenches area appears to have reached Ponds B-1 and B-2 There is no evidence that any of the other B-series ponds are being, or will be, impacted by the VOC plume originating from the OU 2 East Trenches The draft groundwater strategy plan, which is being developed jointly among DOE, EPA, CDPHE, Kaiser-Hill, and RMRS, further discusses potential source removal from the OU 2 East Trenches and groundwater remediation (e g , plume capture and passive treatment at plume front) to minimize the risk from contaminant migration to the surface water system at South Walnut Creek Because EPA and CDPHE are involved in the development of this plan, they will have every opportunity to provide input into the strategy for protecting this ecological resource

2 Comment

Vol I Appendix J Page ES-3 DOE must ensure that the Old Outfall (IHSS 143) actually is included in the OU 8 (Industrial Area) evaluation

Response

The Old Outfall (IHSS 143) is in the process of being formally transferred to the Industrial Area through the interagency Working Group for Consolidation of Operable Units at RFETS (RMRS, 1995b) include transferring IHSS 143 to the Industrial Area OU

3 Comment

Vol I Appendix J Page ES-3 Why was surface water modeling done instead of actual measurements? Were modeled numbers ever verified by comparison with the actual site measurements? (see comment 38)

Response

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The rationale for conducting surface water modeling was provided in the Modeling TM, which was reviewed and commented upon by the agencies, and Appendix H of this draft RFI/RI report Section H3 6 of Appendix H states that "Measured concentrations of Americium-241, Plutonium-239/240, and antimony in stream and pond water were used to check the reasonableness of the simulation results "

4 Comment

Vol I Appendix J Page ES-4 As in the OU 2 RFI/RI, DOE again seems to be inappropriately "stretching" the 10^{-4}-10^{-6} risk range, especially when determining the point of departure The risks and uncertainties associated with exposure from contaminants should be stated in an RFI/RI without any attempts at editorializing Risk at 10^{-6} is still the point of departure

Response

Although 10^{-6} is the point of departure, EPA provides specific guidance in OSWER Directive 9355 0-30 (EPA, 1991) on the use of the risk range

"Generally, where the baseline risk assessment indicates that a cumulative site risk to an individual using reasonable maximum exposure assumptions for either current or future land use exceeds the 10^{-4} lifetime excess cancer risk end of the risk range, action under CERCLA is generally warranted at the site For sites where the cumulative site risk to an individual based on reasonable maximum exposure for both current and future land use is less than 10^{-4}, action generally is not warranted, but may be warranted if a chemical specific standard that defines acceptable risk is violated or unless there are noncarcinogenic effects or an adverse environmental impact that warrants action A risk manager may also decide that a lower level of risk to human health is unacceptable and that remedial action is warranted, for example, there are uncertainties in the risk assessment results Records of Decision for remedial actions taken at sites posing risk within the 10^{-4} to 10^{-6} risk range must explain why remedial action is warranted "

DOE believes that statements regarding risk made in the Executive Summary are consistent with this guidance

5 Comment

Vol I Appendix J Section J1 4 IHSSs Evaluated in the HHRA DOE must ensure that the groundwater collected under the South Spray Field Area (former IHSS 167 3) and at Trenches A, B, and C (IHSS 166) are evaluated under the OU 7 and OU 8 (Industrial Area) RFI/RIs

Response

The potential groundwater contamination near the OU6 Trenches, south of the OU7 Landfill will be addressed under the Sitewide Groundwater Strategy The results of the Colorado Department of Public Health and Environment (CDPHE) conservative screen on the soil samples collected from IHSSs 166 1, 166 2, and 166 3, as reported in the final OU6 Letter Report (DOE 1994)

6 Comment

Vol I Appendix J Section J2 1 1 Data Sets Used in the Risk Assessment Surface Soil Section The section describing surface soil samples collected and used is confusing DOE should make it clear (since this is a public document) that surface soil samples were collected from all possible sources in OU 6, but that some areas were eliminated by the CDPHE Conservative Screen as low risk, and were not included in the baseline human health risk assessment

Response

This section was clarified

7 Comment

2

Attachment B.

Vol I Appendix J Section J2 1 1 Data Sets Used in the Risk Assessment Subsurface Soil Section This information may be more clearly presented in other volumes of the RFI/RI, but was not clear in the Human Health Risk Assessment volumes What were the exact subsoil sampling locations? IHSSs 166 3 (Trench C East) and IHSS 167 3 (South Spray Field east) had significant changes in boundary definition, apparently (from the text on page J2-2) after samples used in the HHRA were taken Therefore, it was really unclear whether the correct locations for Trench C East (IHSS 166 3) and for the South Spray Field Area (IHSS 167 3) were re-sampled, and if so, whether this information was included in this risk assessment Do the values that were used either in the CDPHE screen or in this HHRA reflect the actual concentrations found at those newly defined IHSSs or at the relatively uncontaminated sites that had been misidentified as IHSSs?

Response
Based on comments received, these IHSS investigations were not explained well The statement that the IHSS 166 3 East location was revised and relocated is in error The IHSS location has never changed The borings are outside the area that the Work Plan defines for the IHSS because they were based primarily on aerial photos and the geophysical study The text was revised

IHSS 167 3 was relocated by the Historical Release Report to a location next to the landfill pond This occurred after the field work from the OU6 Work Plan had been completed Because the OU6 files contained a photo that showed the original location potentially being used as a spray evaporation field, the decision was made to retain the original location in the RFI/RI Report If contamination would have been found in this IHSS, the former IHSS would have been returned to its original status as an IHSS However, it passed the CDPHE Conservative Screen and is documented in the OU6 Letter Report dated October, 1994 The new location for IHSS 167 3 was evaluated by OU7

8 Comment
Vol I Appendix J Section J3 1 3 Frequency of Detection Editorial comment First sentence is not clear Add, "and also all" prior to "detected organic compounds"

Response
The text was revised

9 Comment
A) Vol I Appendix J Section J3 1 4 Professional Judgment CDPHE comments on Sept 27, 1994 for OU-6, TM-4 (COCs), questioned DOE's rationale for eliminating cesium-137 as a COC in groundwater because the most recent data showed an upward trend DOE should address or reiterate any prior response to the following comment

> "**Section 5 4** (partial) The last two samples from both wells with cesium-137 detects, however, showed the highest concentrations Are there any more recent samples from these two wells that show that cesium-137 is not still increasing, perhaps indicating a contaminated plume?"

Response
Well 1286, which was installed in the alluvium at the northwestern shore of Pond A-3, was sampled once more before it was abandoned After the 5/14/92 cesium-137 activity of 4 5 pCi/L was detected, an activity of 0 6 pCi/L was obtained from a groundwater sample collected 7/13/92 It should be noted that the error on the 4 5 pCi/L is 1 960, while the error on the 0 6 pCi/L is 0 505 Therefore, the data do not support the indication of an upward trend in this well

3

Well 1786, which was installed in the bedrock upgradient from Pond A-1, has not been sampled again for total cesium-137 However, reviewing dissolved cesium-137 activities does not indicate an increasing trend It should be noted that the error on the last total cesium-137 activity obtained (1 8 pCi/L) is 1 73

B) Vol I Appendix J Section J3 1 4 Professional Judgment CDPHE comments to EPA on Sept 27, 1994 for OU-6, TM-4 (COCs), questioned DOE's decision to eliminate all metals as COCs in groundwater due to elevated suspended solids The decision was questioned on the grounds that most people do not drink filtered well water, and that the risk from drinking unfiltered water therefore should be assessed for all metals per RAGS guidance DOE apparently ignored these comments too, except for assessing groundwater arsenic, antimony, beryllium and manganese in separate risk evaluations as "background" components Because these metals are among those that could pose the greatest risk from drinking unfiltered water, these separate risk evaluations are an adequate way for DOE to address my concern

Response

DOE did consider CDPHE's comment concerning the elimination of metals as COCs and strengthened the technical evidence to support this action in the final COC TM (DOE, July 1995), which was approved by EPA (1994a) In accordance with Phase V of the agency-approved Gilbert Methodology for background comparisons (Gilbert, 1993), groundwater metals data were further evaluated, concluding that there is

- A strong correlation of elevated metal concentrations with total suspended solids and total dissolved solids
- The presence of naturally occurring zones of high manganese and other ions
- A wide distribution of observed concentrations of metals and absence of spatial pattern
- No correlation of metal concentrations with VOC contamination
- An absence of temporal pattern

More details on this evaluation may be found in the final COC TM

10 Comment

Vol I Appendix J Section J3 3 1 Page J3-6 Concentration/Toxicity Screens, and Table J3-10 The concentration-toxicity screen DOE performed on radionuclides in subsurface soil should have used external radiation slope factors for a construction worker's exposure to uranium-238 and uranium-235 rather than the inhalation or oral slope factors, since the external radiation factors are larger (RAGS p 5-24) When these slope factors are substituted, both U-238 and U-235 are responsible for more of the total risk than Pu or Am Pu-239/240 and Am-241 contribute less than 1% of the total risk Nevertheless, for the reasons delineated in the text on Page J3-6, Pu-239/240 and Am-241 should remain as COCs for subsurface soil So, the text is correct, but the table is wrong, and should be corrected

Response

Yes, the external slope factors for U-238 and U-235 should have been used in the subsurface soil concentration/toxicity screen Table J3-10 was corrected to include a column for external slope factors and the concentration/toxicity screen was rerun using the most conservative slope factor The text is correct and remains the same

11 Comment

Vol I Appendix J Section J3 1 6 Page J3-3 Evaluation of Infrequently Detected Compounds CDPHE still contends that it is not appropriate to use RBCs calculated for any other receptor except residential (i e , the most conservative) when trying to eliminate chemicals as COCs Therefore, residential PRGs as opposed to construction worker PRGs should have been used to compare with concentrations of infrequently detected compounds The screening process for COCs should be inclusive and conservative

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Response
The construction worker scenario was developed in consultation among DOE, EPA, and CDPHE to characterize exposure to subsurface soils DOE believes that PRGs calculated using this exposure scenario are appropriate for this screen However, when the concentrations for infrequently detected compounds are compared to residential PRGs, the results are the same

12 Comment
Vol I Appendix J Section J3 3 1 Page J3-7 Concentration/Toxicity Screens Despite DOE's inappropriate use of construction worker PRGs instead of residential PRGs, it did not appear to make any difference in the final list of COCs for subsoil

Response
That is correct, it doesn't make a difference

13 Comment
Vol I Appendix J Section J3 4 1 Concentration/Toxicity Screens Groundwater Page J3-9 DOE's rationale to eliminate both strontium-89/90 and radium-226 because of small sample sizes is based on poor logic Instead, it is more appropriate to be conservative, since sample sizes are so small, and keep these two chemicals as COCs Small sample size is not a good reason to eliminate strontium However, the fact that strontium detects occurred apparently sporadically, and there did not appear to be an upward trend in the most recent samples, is a good reason to eliminate this chemical The text should be revised

DOE included radium as a COC, but devoted several paragraphs to why it should not be considered as one, citing small sample size, and similarity to background as reasons However, Table J3-15 shows 1 2 pCi/liter radium in groundwater, a level "close to background", contributed 13 5% of the total risk Moreover, "radium was only analyzed for in two other samples outside IHSS 143" (the Old Outfall, which will be evaluated in another RFI/RI) Thus, DOE does not have much data on which to base its conclusion that radium should be eliminated It is inappropriate to eliminate a chemical as a COC based on limited sample size Rather, the conservative, public health protective approach should be used when data is limited, and, because of the relatively large contribution to the total risk and the small number of samples, the text discussing why radium should be eliminated as a COC should be deleted Finally, another argument for including radium in the background data set is that radium was not analyzed for in background groundwater It also was not analyzed for in surface soil Therefore, no information is available as to whether it could have come from sources at OU 6 Therefore, because of the lack of radium data for a proper comparison, the whole section arguing for elimination of radium as a COC should be eliminated

When checking the risk calculation tables in Vol II, DOE did NOT include inhalation of radium originally from groundwater in its risk calculations Therefore, DOE appears to have eliminated this COC after all, and underestimated the risk

Response
The text does not state that these analytes were eliminated based solely on small sample size The small sample sizes preclude a use of the statistical comparisons to background, so any comparison to background must be made using maximum detects and background $UTL_{99/99}$, where available As per the approved final COC TM, the important comparison here is that the maximum of the three detected strontium-89/90 values is 1 22 pCi/L, while the background UTL99/99 is 1 154 pCi/L The rationale provided by CDPHE to eliminate strontium as a PCOC will be added to the text However, whether or not strontium-89/90 is included as a COC is a mute point because, as agreed upon during meetings with the agencies, risks from exposure to contaminated groundwater were not estimated on an OU-by-OU basis Rather, groundwater is

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being addressed on a Sitewide basis by an interagency working group that includes CDPHE If strontium-89/90 is truly a groundwater chemical of concern for the RFETS, the opportunity for estimating its risk is still available

The discussion on eliminating radium as a groundwater COC was omitted from the text Radium-226 is included as a COC in groundwater Under the site conceptual model, there is no current or future consumption of onsite groundwater; therefore, the only risk characterization of groundwater conducted for OU 6 was the volatilization of analytes (VOCs) from the groundwater through hypothetical building foundations Because radium-226 is not a gas and would not migrate through building foundations, it was not assessed for this pathway

14 Comment
Vol I Appendix J Section J3 4 2 Groundwater COCs Evaluated in the HHRA Page J3-10
CDPHE internal advisory comment, removed

Response
None required

15 Comment
Vol I Appendix J Section J3 5 1 Concentration/Toxicity Screens Pond Sediment Page J3-11
Are there any seeps in OU 6 whereby groundwater contaminants could contact pond sediment?

Response
Please see response to comment number 1

16 Comment
Vol I Appendix J Section J3 5 3 1994 Pond Sediment Samples Page J3-12 Also Vol II Attachment J5 I do not understand why DOE did not include PAHs and metals as well as rads and Aroclor-1254 in the 1994 assessment of pond sediment The fact that PAHs and metals were not also included in the 1994 risk assessment of pond sediment, means that the final risk values from the 1994 risk assessment and the 1992 risk assessment cannot be strictly compared Another factor that differs between the two is two foot composite samples were taken in 1992, while only 6 inch samples were taken in 1994 Therefore, 1992 surface sediment contaminants (which are the most likely that ecoworker or open space receptors may be exposed to) may have been diluted more with deeper sediments in the 1992 samples This is borne out by the higher concentrations and risks found in the 1994 assessment compared to the 1992 assessment

Response
The purpose of the 1994 sampling program was to collect aquatic biological and sediment samples to evaluate the potential ecotoxicological effects and bioaccumulation potential for polychlorinated biphenyls (PBCs) The radionuclide analytes were added to the project to provide additional characterization At the time that the field sampling plan was written and approved, COCs were undetermined for human health, but preliminary results indicated that PCBs and radionuclides may have been at significant levels Funding also played a major role in determining what analytes would be included in the sampling plan It was never DOE's intent to strictly compare the 1994 sediment data with the 1992 sediment data The data was included in the HHRA so as not to preclude any data from assessment That is why these data sets are reported and discussed separately

17 Comment
Vol I Appendix J Section J3 6 Pond Surface Water COCs Page J3-12 Were only metals and rads, not VOCs, SVOCs, and WQPLs sampled for in both filtered and unfiltered water samples? That's what the text implies

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Response
Yes, only metal and rad analyses were run on both filtered and unfiltered water samples The sampling methods for VOCs, SVOCs and WQPLs require unfiltered samples Filtering water samples destined for VOC analyses would drive off the volatiles and defeat the purpose of collecting the samples

18 Comment
Vol I Appendix J Section J3 7 Stream/Dry Sediment COCs Page J3-13 DOE did not include all pond sediment COCs in its assessment of dry sediments Instead, it only assessed risk from those COCs that were found in stream sediments Therefore, PCBs, antimony, silver, and bis-2(ethylhexyl)phthalate, which are all found in pond sediments, but not stream sediments, are not assessed in the risk assessment for dry sediments, even though DOE states, "Dry sediment is exposed sediment near stream channels or in the floodplains of the ponds" The risks from ingestion, dermal exposure and inhalation of dust containing these pond sediment chemicals should be included in DOE's assessment of dry sediments, at least qualitatively Otherwise, DOE has underestimated the risks from this media

What DOE did instead of assessing all appropriate COCs that could be in dried sediment from streams or pond edges was to use the stream sediment COCs in the risk assessment, and compare them to COCs present in "dry sediment" (obtained from which source?) Since there were few differences in the concentrations of chemicals or metals between the two groups, DOE decided that "dry sediment would have little or no effect on the selection of COCs (Table J3-29)l" It is CDPHE's observation that DOE chose to use the most convoluted way possible, instead of using the simple approach, which would have been to just use all stream and pond COCs

Response
The decision to include dry sediment data with the stream sediment data for risk assessment purposes was made jointly among DOE, EPA, CDPHE, and EG&G A review of the dry sediment sampling locations on Figures 4 4-12 through 4 4-17 reveal that in most cases the dry sediments were actually taken in or near the stream beds These samples are therefore more exposed than the deeper, submerged pond sediments It was also a mutual decision by the agencies to assume for risk assessment purposes that the ponds are in place and the pond sediments are submerged (i e , pond sediments would not be available for ingestion or external irradiation exposure

Initially, there was some discussion of including the dry sediment data with surface soil data, which is why these two media are discussed together in Section 4 0 of the RFI/RI report However, later discussions among the agencies resulted in grouping them with stream sediment data instead

With regard to the concern that pond sediment COCs are not assessed, a review of the dry sediment data on the above figures reveals that of the COCs the State mentioned only bis(2-ethylhexyl)phthalate is shown No PCBs were detected in dry sediment samples and silver and antimony concentrations did not exceed their respective background mean plus two standard deviation concentration As a quick reality check, the maximum concentration of bis(2-ethylhexyl)phthalate detected was 130 ug/kg, or 0 13 mg/kg This value is low compared to even the most conservative PRG (residential soil) of 45 7 mg/kg The reviewer is also referred to Table J3-29, Evaluation of Dry Sediment Concentrations and Selection of COCs for Stream/Dry Sediments Although CDPHE has assumed that the treatment of dry sediments by DOE is "convoluted", much thought and discussion, including with CDPHE staff, went into the decision to treat dry sediments in the way that they were

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19 Comment

Vol I Appendix J Section J3 7 3 Chemicals of Interest (COIs) In the OU 3 dispute resolution last spring, both Agencies had asked that beryllium be included with arsenic as a chemical of interest, since it had been used at the plant, and was indistinguishable from background I understood this request was to be applied to all OUs not merely OU 3 (OU 3 meeting notes from February 3, February 8, April 25, 1995)

Response

Beryllium is shown on Table J3-30 as a chemical of interest for groundwater and is discussed in Section J3 4 4, estimated risks from exposure to beryllium in groundwater are presented in Section J10 3 2 The only COI that EPA or CDPHE requested DOE consider for OU 6 stream sediments is arsenic (EPA, 1994a) Beryllium was not determined to be a PCOC in this medium based on background comparisons using the approved Gilbert methodology (see Table A-35 in the final COC TM [DOE, 1995]) The purpose of the background comparison is to remove naturally occurring inorganics from the COC list that are indistinguishable from background

20 Comment

Vol I Appendix J Table J3-3 Metals and Pesticides/PCBs Detected at less than 5% Frequency, Surface Soil None of the maximum detected concentrations of these chemicals exceeded the residential soil PRGs

Response Yes, that is correct

21 Comment

Vol I Appendix J Where is the frequency of radionuclide occurrence table for surface soils, similar to Table J3-2 and J3-3?

Response

Frequency of detection tables do not exist for radionuclides As stated in Section J3 1 3, "Radionuclides were assumed to be detected at 100 percent frequency for statistical analysis (i e , negative, zero, and positive results were retained in the data set), thus, the radionuclides were not screened based on frequency of detection " Also see the COC TM

22 Comment

Vol I Appendix J Section J3 5 1 Concentration/Toxicity Screens Pond Sediment COCs Page J3-10 and J3-11 This comment relates back to comment No 1 DOE eliminated manganese from further evaluation as a COC in pond sediment on the basis that it was not a potential contaminant in surface soil, subsurface soil, or groundwater However, Mn was identified as a COI (contaminant of interest) in groundwater Is there anyplace in OU 6 where groundwater "daylights", perhaps at a seep, and becomes surface water? The volumes I reviewed made no mention of seeps on OU 6 Are there any there, and if there are, could the high Mn in groundwater, which DOE says is indistinguishable from the high background, come to the surface and become a problem in pond or stream sediment?

Response

See response to comment No 1 As a reality check, the maximum concentration of manganese in groundwater is 6 2 mg/L The residential surface water PRG for swimming is 140 mg/L and the wading ecological worker PRG is 213 mg/L The manganese PRG for exposure of an ecological worker to soil/sediment is 18,500 mg/kg Thus, it does not appear that any manganese in groundwater daylighting to surface water will present problems in pond or stream sediment

8

Attachment B.

23 Comment

Vol I Appendix J Table J3-7 Organic Compounds and Metals Detected at less than 5% Frequency Subsurface Soil None of the maximum detected concentrations exceed residential soil PRGs Therefore, this table is OK, despite DOE's use of construction worker RBCs, instead of residential RBCs, which CDPHE had requested

Response

None required

24 Comment

Vol I Appendix J Table J3 - 9 Concentration/Toxicity Screen Subsurface Soil, Carcinogens Minor comment The risk factor listed in this table for bis(2-ethylhexyl)phthalate is incorrect The correct value should be 1 54E-03 However, substitution of this small number makes no difference in the final summed total risk factor

Response

The correct value for bis(2-ethylhexyl)phthalate was substituted in the table

25 Comment

Vol I Appendix J Table J3-12 Organic Compounds and Total Metals Detected at Less than 5% Frequency, Groundwater The following maximum detected concentrations exceed the residential PRGs for groundwater ingestion and indoor use 1,1-DCE, benzene, carbon tetrachloride, and vinyl chloride DOE eliminated these chemicals based on frequency of occurrence and because the groundwater is not likely to be used by onsite residents in the future However, if the groundwater were ever used, these concentrations would pose a risk In addition, these chemicals could also migrate from groundwater into any basements on site, and pose a risk by inhalation

Response

DOE has clearly stated that the use of the future residential scenario for onsite risk assessments is not appropriate EPA and CDPHE have provided DOE with correspondence concurring that this scenario is highly unlikely for RFETS and may be excluded form OU-specific risk assessments However, as a reality check, 1,1-DCE, benzene, and carbon tetrachloride would still not be included as special-case COCs for groundwater because their respective maximum concentrations do not exceed 1,000 times the residential PRG for groundwater Vinyl chloride is already included as a special-case COC for groundwater

26 Comment

Vol I Appendix J Table J3-13 Concentration/Toxicity Screen, Groundwater, Noncarcinogens Also Page J3-10 DOE did not perform this concentration/toxicity screen for groundwater noncarcinogens appropriately DOE included nitrate in the toxicity screen, and showed that it was responsible for 98 9% of the risk Then DOE used professional judgment after the concentration/toxicity screen to eliminate nitrates from the risk evaluation In doing this, DOE disregarded the agreement made between the three parties this past spring that professional judgment to eliminate chemicals from the risk assessment would only be used as part of the spatial/ temporal/geochemical step of the Gilbert statistical analysis, and would not be used after the concentration/toxicity screen If DOE had eliminated nitrate early on during the process on the basis of professional judgment, a number of the other groundwater contaminants, all VOCs, which could pose some risk by pathways (i e , inhalation) other than ingestion, would not have been eliminated as COCs Inhalation is a complete pathway for anyone (i e , an office worker) who spends time in a building with a basement As it is, DOE showed a significant proportion of risk could come from nitrate in groundwater that was ingested, and then essentially discounted it since a) groundwater ingestion would not be a complete pathway under the agreed upon

9

exposure scenarios, and b) the source term information is OU 4 data, not OU 6 data Then, DOE essentially ignored any contribution to risk from the VOCs in groundwater (since they had not passed the con/tox screen) This is a public document, and such practices certainly do not add to DOE's credibility as an objective reviewer of the contamination data at Rocky Flats

Response
DOE shares CDPHE's concerns about nitrates However, DOE did not use professional judgment to eliminate nitrate from the HHRA Nitrate was determined to be a COC for groundwater (see table on page J3-8) It is very clearly stated in Section J3 4 2 that there are no exposures to nitrates in groundwater under current and future use scenarios in OU 6 Risk can only be calculated when there is an exposure to a chemical DOE did not ignore the risk of VOCs in groundwater Chloroform, methylene chloride, tetrachloroethene, and trichloroethene were included as COCs in groundwater for exposure to VOCs in indoor air AOC No 1 did not have groundwater associated with it, and the office worker exposure scenario was not complete for AOC Nos 3 and 4 Methylene chloride was included in the assessment of noncarcinogenic effects from the inhalation of VOCs migrating from groundwater in AOC No 2 through building foundations (see Table J8-2 and backup risk calculation in Attachment J3) It should be noted that maximum groundwater concentrations were used in modeling the basement air concentrations This is a very conservative approach Toluene is the only other constituent that could have been included in this assessment The HQ for methylene chloride was 0 000000000002 , significantly below the point of departure (HQ=1 0) Based on a maximum detection in AOC No 2 of 8 ug/L, the inclusion of toluene might triple the HQ for the future office worker, still a very small number The noncarcinogenic effects of toluene for this scenario will be discussed in the uncertainty section The text of Section J3 4 2, Groundwater COCs Evaluated in the HHRA, was clarified to reflect the above

27 Comment
Vol I Appendix J Table J3-17 Organic Compounds and Metals Detected at Less than 5% Frequency, Pond Sediment The following maximum detected concentrations exceed the residential surface soil PRGs, even though these chemicals occur at a low frequency Aldrin and Aroclor-1260 Neither of these chemical maximum concentrations exceed open space PRGs for surface soil

Response
The open-space recreational user is an accepted receptor of pond sediments per the final approved COC TM However, as a reality check, neither aldrin nor Aroclor-1260 would be included as a special-case COC because their respective maximum concentrations do not exceed 1,000 times the residential soil RBC

28 Comment
Vol I Appendix J Table J3-18 Concentration/Toxicity Screen, Pond Sediment, Noncarcinogens Also Tables J3-19 and J3-20 This comment relates back to comment no 18 DOE should have considered the possibility that pond sediments, especially those around the pond edges could dry up and become available for inhalation Therefore, as mentioned in comment 18, DOE should have considered inhalation as a complete pathway for all chemicals detected in pond sediments when performing the concentration/toxicity screen The footnote at the bottom of each table stating "inhalation is an incomplete pathway" should be deleted If inhalation RfDs or slope factors are available, and would result in a more conservative risk factor than the oral toxicity numbers, they should be used when performing the concentration/toxicity screen

Response
Those organic compounds with inhalation RfDs in Tables J3-18 and J3-19 are volatiles and if the pond sediments would become unsaturated, these compounds would volatilize quickly and not be a problem in the dry sediments In addition, the agencies agreed that for risk assessment purposes the ponds would be considered saturated

29 Comment
Vol I Appendix J Table J3-22 Organic Compounds and Total Metals Detected at Less than 5% Frequency, Pond Surface Water None of the maximum detected concentrations exceed the PRGs for residential swimming

Response
None required

30 Comment
Vol I Appendix J Section J4 1 Current and Future Land Use, Page J4-3, Future Offsite Land Use DOE should mention that "mixed" land uses include residential

Response
" , including offsite residential," was added to the sentence concerning mixed land uses

31 Comment
Vol I Appendix J Section J4 1 Page J4-3 & 4, Future Offsite Land Use The fact that DOE chose not to consider current and future offsite receptors when evaluating individual OUs like OU 6 means that a site-wide Baseline Risk Assessment which does consider the impact of the RFETS site to offsite receptors is now necessary This "hole" in the individual OU risk assessments should not be forgotten

Response
The decision to not consider offsite receptors was not DOE's alone It was made at the February 21, 1995, meeting among DOE, EPA, CDPHE, and EG&G, with written confirmation from the agencies following In fact, this decision was initiated by EPA It is DOE's intent to assess risk to offsite receptors in a Sitewide BRA, as require for site closure under CERCLA

32 Comment
Vol I Appendix J Section J4 4 1 Site-wide Exposure Pathways that are Incomplete or Potentially Complete, but not Assessed Page J4-7 Ingestion of fish may be a potentially complete pathway if stream flows are substantially increased as projected in the Vision document If any changes in use are brought about by the Vision or other site-wide actions, this risk assessment will have to be re-visited to include pathways that were considered incomplete before Otherwise, DOE will underestimate potential exposures

Response
If stream flows on RFETS do increase and fish are caught onsite for human consumption, DOE will re-visit this pathway

33 Comment
Vol I Appendix J Section J4 4 4 Future Construction Workers Page J4-9 & 10 Exposure by construction workers to surface soil is a complete, and substantially significant pathway CDPHE has repeatedly asked DOE to include this pathway in its analysis of this receptor's exposures, but DOE has consistently failed to do so As such, DOE has underestimated the risks to this receptor This must be kept in mind when using DOE's PRG values for the construction worker as well as when reviewing DOE's risk evaluations In addition, DOE also refuses to evaluate potential

construction worker exposure to surface water and sediments This approach also underestimates risks since road, bridge, and culvert construction all could involve exposure to these two media

Response
The construction worker exposure scenario was developed through discussions among DOE, EPA, and CDPHE to specifically assess risks from subsurface soils because no other exposure scenarios assess this environmental media, all of the other exposure scenarios directly assess risks from surface soils The HHRA does evaluate the inhalation pathway for exposure of airborne particulates released from surface soil to construction workers Due to adequate characterization of risks from surficial soils, it was previously agreed upon by DOE, EPA, and CDPHE that the construction worker exposure scenarios would only assess exposures to subsurface soils Based on this agreement COCs and exposure scenarios were developed and approved for use for surface soils and subsurface soils separately

DOE does not anticipate major road construction activities in the buffer zone In addition, to preserve the ecology of the buffer zone, construction in and around the ponds and streambeds would be kept at a minimum Due to the short exposure duration of the construction scenario, surface soil risk from other scenarios will better define the high end of the risk spectrum for surface soils

34 Comment
Vol I Appendix J Section J5 1 Calculating the RME Concentration EPA guidance (RAGS, p 5-10) is that diluted samples which far exceed the measured concentrations of the chemical in other samples should be reanalyzed first to confirm the result, before the step is automatically taken to excluded them from the data set if they cause the arithmetic mean concentration to exceed the maximum detected concentration

Response
Dilution is usually required when concentrations of one or more analytes exceed the linear working range of the instrument However, results from the analyte(s) that necessitated the dilution were reported and used in the data evaluation

The referenced discussion pertains to sample results that were U-qualified (nondetects) with an SQL elevated probably due to sample dilution To use one-half of the elevated SQL for these nondetected results would erroneously increase the estimate of the concentration term (EPA, 1989) Pre-dilution U-qualified SQLs would not be omitted from the results One of the reasons for dilution is to bring high concentrations of a particular analyte within the range of a certain analytical method as mentioned However, the analytes exhibiting the high concentrations would not be U-qualified

The text will be modified to include a reference to EPA (1989) where elimination of unusually high SQLs for nondetected results is discussed

35 Comment
Vol I Appendix J Section J5 4 Groundwater Page J5-3 The only pathway evaluated for groundwater was volatilization of chemicals from groundwater to basement indoor air

Response
Yes, that is correct

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36 Comment

Vol I Appendix J Section J5 8 Outdoor Air (Particulate-Associated COCs) Page J5-4 DOE states on this page that, "airborne emissions of SVOCs, metals, and radionuclides associated with wind erosion of particulate matter (dust) less than 10 microns in diameter (PM10) were evaluated" However, when one checks the risk calculations in Vol II for all the receptors, those COCs which do not have inhalation toxicity factors, including metals and the SVOCs, were not quantitatively evaluated for exposure to this pathway in the risk assessment, even though they were modeled, and exposure point concentrations (annual averages) were determined (Table J5-11) In addition, these chemicals were not evaluated qualitatively in the uncertainty section either Therefore, DOE has underestimated the risks from the inhalation pathway The State has repeatedly asked for at least a qualitative assessment of the inhalation risks from those chemicals that do not have inhalation toxicity numbers, and DOE has consistently refused to do this important evaluation

Response

COCs without toxicity values were modeled as they should be, to determine maximum concentration that might be airborne It is not possible to quantitatively evaluate risks for chemicals that do not have toxicity values A qualitative assessment of the impact of the airborne COCs with no toxicity values on potential risk or hazards will be placed in Section J10 1 5

37 Comment

Vol I Appendix J Section J5 8 Outdoor Air (Particulate-Associated COCs) Page J5-4 to 6, and Section J5 9 Indoor Air (VOCs) Someone should look in more detail at the air model used to model wind erosion, as well as the other air models used to estimate construction activity dust and indoor air concentrations What assumptions were made for these models? Were they appropriate? How do the results of these models compare to measured values taken at the site? Are these models the same ones which were approved for use in OU 2?

Response

No action necessary Parameters and assumptions used in the air modeling have been available to CDPHE since transmittal of the final Modeling TM for OU 6 in February 8, 1994 (DOE, 1994) There were no comments received from CDPHE on the air modeling portion of TM The parameters and assumptions are also given in Appendix I of the RFI/RI report The purpose of the TMs, agreed to by DOE, EPA, and CDPHE, is to give the agencies the opportunity to review the parameters, assumptions, models, and methods prior to submittal of the RFI/RI report To continually question the methods, parameters and assumptions already presented and reviewed in the TMs is a waste of the reviewers and the responders time and the public's money

See also the response to EPA question number 12 in Attachment A

38 Comment

Vol I Appendix J Section J5 10 Surface Water and Sediment Modeling Results Page J5-7

a) DOE decided to model exposure point concentrations for pond sediment rather than use actual measured concentrations, even though these were available from both 1992 and 1994 One of the assumptions included in the model was that the RME concentration in sediment would be estimated at one-half the total deposition time of 30 years = 15 years, so that the sediment concentration would represent a depth-weighted average I do not know if this is an appropriate assumption, given the rate of sedimentation in the A and B series ponds Elizabeth Pottorff or Sandy Marek of CDPHE's WQCD should be consulted concerning the validity of the assumptions made or the results of the model

b) Moreover, when the RME concentration of Am-241, and Pu-239 were modeled at 15 years, the value for Pu used in the risk assessment was about 5 times lower than the actual measured values

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from the 1994 study, which were also used as RME point estimates in a separate risk assessment (Table J5-13 & Appendix J5, Table 2) (7 83 E+1 was the maximum for all 4 B series ponds in the modeled 1992 data vs a 95% UCL on the mean of 403 3 pCi/g for Ponds B1 and B2 in the measured 1994 data) This seems like a big difference to me between modeled and measured values I am not sure the modeled value used as the RME concentration in the Baseline Risk Assessment was the most appropriate number to use, especially since this RME exposure point concentration was not calculated according to EPA guidance (Supplemental Guidance to RAGS Calculating the Concentration Term, EPA, 1992)

c) In addition, all pond sediment COCs were only evaluated for risks from sediment ingestion Aroclor 1254 and bis(2-ethylhexyl)phthalate were the only pond sediment COCs evaluated for risks from dermal exposure The external radiation and inhalation pathways were not assessed for any of the pond sediment COCs (unless there was overlap with stream sediment COCs) Therefore, as stated in comment No 18, risks from inhalation of PCBs, antimony, silver, bis-2(ethylhexyl)phthalate, as well as vanadium, and the PAHs in pond sediment were not evaluated Moreover, the RME concentrations of americium and of plutonium in pond sediments (9 28 and 28 pCi/g respectively in the A pond series and 99 3 and 78 3 pCi/g respectively in the B pond series) were several times higher than the RME concentrations in stream/dry sediments (0 310i and 2 519 pCi/g for Am and for Pu, respectively) DOE used the lower concentrations to estimate risks from inhalation of sediments Therefore, DOE again underestimated the risks from this exposure pathway for all appropriate receptors This comment also applies to the external radiation pathway

Response

a) It was not DOE's sole decision to model exposure point concentrations as implied in the comment The action was taken in consultation with the agencies and presented in the Modeling TM for agency review Modeling parameters and assumptions for sediment transport are also presented in Appendix H of the RFI/RI report

b) Modeled values were only used for antimony, americium-241 and plutonium-239 for the main risk assessment This was done to account for the contributions of surface soil COCs to the pond sediments This was done with the full knowledge and participation of the agencies in this decision The 1994 measured values were used for a separate risk assessment for general comparison

c) During discussions held in the spring of 1995 among DOE, EPA and CDPHE, it was decided that the ponds were not going to be drained and that the HHRA would be performed assuming the ponds remained full This was presented in the Exposure TM and agreed to by all parties When the ponds are full, there are no exposures to deep sediments by inhalation or external radiation pathways Refer to the response for comment 18

39 Comment

Vol I Appendix J Section J6 2 1 Soil and Sediment Ingestion Page J6-3 Neither EPA nor CDPHE have approved the use of the soil or sediment matrix effect (ME) DOE proposed to use a soil matrix effect of 0 5 or 1, depending upon the specific chemical, on OU 5 and OU 2, and was refused both times Now it has appeared again in the OU 6 risk assessment The Agencies expect DOE risk assessors on separate OUs to communicate, and not repeat the same errors for OU 6, OU 4, etc where the points were not discussed directly The answer is still "no", it is not appropriate to use a single soil matrix effect across the board, without including site-specific information, as delineated in several memos from EPA's Susan Griffin This exposure factor should be deleted from all text and tables, and the risk calculations which had used it should be revised In at least one case, the deletion of this factor and recalculation of risks results in an increase of risks over the 1 E-6 point of departure number This is true for Open Space

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Recreational Use AOC No 4, RME time-weighted average pond sediment ingestion (for Aroclor-1254) It is also true for the total RME risks for the open space receptor in the 1994 sediment risk assessment for the B series ponds (Attachment J5) The total risks from all pathways for this receptor = 8 97 E-6 if the Matrix Effect is deleted Recalculation of HQs after deletion of this factor did not seem to have any major effect since most HQs were much below 1

Response

DOE disagrees that use of a soil matrix effect to estimate absorption of a compound through the gut wall is inappropriate EPA approved toxicity criteria (reference doses and cancer slope factors) are derived from studies in which the compound is administered in a readily absorbed form (e g , food, water, corn oil) For virtually all compounds considered in RFETS risk assessment, absorption of these compounds when ingested in a soil matrix would be expected to be considerably less than that from a diet-based matrix Nevertheless, assumptions concerning soil matrix effects in RFETS risk assessments have generally defaulted to 1 (100% absorption) when the data support the assumption or information is insufficient to support an assumption of lower absorption For compounds where literature-based information indicated decreased absorption, a conservative assumption of 0 5 (50% absorption) was assumed, even when literature-based values supported estimated of much lower absorption For example, in the OU 6 HHRA, a matrix effect for metals of 0 5 was conservatively assumed In an EPA publication on metals bioavailability, the matrix effect for metals in the diet was between 0 01 and 0 03 (EPA, 1990) It should also be noted that use of the 0 5 matrix effects was only applied to a single compound (Aroclor 1254) that contributed significantly to overall risk There is acceptable precedence for this assumption because the EPA assumed an "ingestion absorption fraction" from soil of 0 3 in developing its PCB spill policy (Labieniec et al , 1994)

Although geochemical speciation studies would be useful for metals, speciation can generally be inferred with confidence from literature-derived data when applied to RFETS-specific data on soils EPA Region VIII has successfully, over several years, performed bioavailability studies on specific metals (e g , arsenic) However, to undertake such studies on multiple compounds would be an enormous undertaking DOE considers, due to the considerations summarized herein, that use of the matrix effect is both scientifically defensible and conservative Therefore, the matrix effect values stated in the OU 6 HHRA have not be changed

40 Comment

Vol I Appendix J Section J6 2 2 Inhalation of Airborne Particulate Matter and of Indoor VOCs Page J6-7 Neither EPA nor CDPHE agree with the simultaneous use of the DF, particulate deposition factor in lungs (0 85) and a Rocky Flats site-specific central tendency or RME respirable fraction (PM10), like DOE proposed to use in the Template In this OU 6 risk assessment, DOE has dropped the site-specific respirable fraction, the factor which was more acceptable, and kept the DF because air modeling was performed using only the PM10 fraction Therefore, the respirable fraction factor was not used in the risk calculations A major problem with the 0 85 respiratory deposition factor is that without chemical-specific pharmacokinetic data, it is toxicologically unsound to assume that less than 100% of the small (< 10 um) particulates deposited in the upper respiratory tract are not available to cause local tissue damage or systemic effects after absorption through the upper respiratory passages or after being coughed up and swallowed Both CDPHE and EPA toxicologists believe that this deposition fraction should be removed All inhalation pathway equations that used the DF should be revised, and the calculations corrected

Response

DOE agrees that the use of the depositional factor is inappropriate if the respirable fraction is used or if suspended particulates are expressed as PM_{10} This parameter was originally added to the sitewide exposure factor tables in response to a request by EPA representatives at the December

15

12, 1994 meeting The depositional factor was removed from the exposure factor tables and from the intake equations, the risks were recalculated for the inhalation pathways

41 Comment

Vol I Appendix J Section J6 2 3 Soil and Sediment Dermal Contact Page J6-7 & 8, Vol II Attachment J3, Open Space Recreational Use AOC 3 and 4 Tables, and Vol II Appendix J Attachment J2 Page J2-2,3 & 4 Soil and Sediment Dermal Contact, Groundwater Ingestion, and Intake of Radionuclides from Ingestion and Inhalation equations

CDPHE checked the available documentation, and the FC = Fraction contacted that is contaminated, was never approved by either Agency In a letter to Steve Slaten dated April 11, 1995 EPA, with the concurrence-of CDPHE, directed DOE to delete the "fraction contacted from the contaminated source" parameter for all open space receptors The only acceptable FC for RME estimates = 1 It was my understanding from the Template discussions which occurred late winter 1994 and spring 1995 that both Agency positions were that FC = 1 for RME estimates applied to all receptors Though it appears that DOE has followed this agreement for the RME receptors, CDPHE does not believe the final discussions ever took place over the CT values for this fraction contacted

The RME value for FC (for dermal exposure) listed in the latest (June 15, 1995) version of the Template is RME = 1, and CT = 0 64 for the residential receptor and 0 9 for occupational receptors A CT value for the open space receptor was never discussed to my knowledge Because this open space receptor appears to be the only one actually evaluated for dermal exposure by DOE, DOE needs to justify its value of 0 5 for PCBs and bis(2-ethylhexyl)phthalate in pond sediment, in particular This is especially true since this number differs even from the unproved fractions listed in the June 15 Template

The Agencies' rationale for disapproving of this fraction contacted is as follows Except for the ingestion of homegrown produce under a residential scenario, neither the EPA nor the CDPHE toxicologists feel that the fraction contacted factor is acceptable These factors are described as time-weighted factors in the Template footnotes Both CDPHE and EPA believe these factors double-count the time component since the exposure frequency has already been reduced to account for the average time spent at the location In addition, the exposure point concentration term represents the integrated contaminant concentrations which a receptor contacts on average over a period of time, and already takes activity patterns into account

Response

EPA guidance on calculation of intakes for incidental ingestion of soil includes the use of the parameter "fraction ingested from contaminated source " In RAGS (EPA, 1989) guidance is given to "consider contaminant location and population activity patterns " In the EPA draft document on CT and RME values (EPA, 1993) it is "advocated that this factor *be given consideration*" (EPA's italics) In Attachment J2, "Exposure Factors Tables," all the FC values for soil ingestion are equal to 1 0 in the reasonable maximum exposure (RME) case for all exposure scenarios EPA directed this approach in a letter dated April 11, 1995 The CT value for FC is 0 9 for all scenarios used in OU 6 except for the open space scenario, which does not include a FC parameter It was agreed in discussions with EPA and CDPHE that this is reasonable for noncontact workers at RFETS due to movement of workers around the plant site

42 Comment

Vol I Appendix J Section J6 2 3 Soil and Sediment Dermal Contact Page J6-8 Absorption Factors DOE assumed 6% absorption through skin for PCBs and 1% absorption other types of organics These values are acceptable

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Response None required

43 Comment
Vol I Appendix J Table J6-1 Age-Weighted Soil and Sediment Ingestion Rates for Carcinogens and Radionuclides It is unclear how DOE came up with either the CT age-adjusted ingestion rate for radionuclides for the open space receptor CDPHE obtained a different number The CT IRadj for open space receptor exposure to rads CDPHE got was 275 mgy/d

Response
The 275 mg-y/day appears to be correct and Table J6-1 was changed accordingly Fortunately, this error was not extended to the risk calculations in Attachment J4

44 Comment
Vol I Appendix J Table J6-4 Dermal Absorption Fractions and Dermal Permeability Constants for COCs in Soil and Surface Water Since this is a public document, it may be helpful to include a footnote to this table explaining which dermal absorption fractions will be used for soil absorption of which groups of chemicals, and that dermal permeability constants are only appropriate to use to calculate dermal absorption from water, and will not be used for soil absorption calculations

Response
The requested footnote was added to this table

45 Comment
Vol I Appendix J Section J7 1 Toxicity Factors Introduction Page J7-2 What is the EPA, 1992f reference? It is not listed in the reference section of this volume

Response
This is a misprint, the reference should read EPA, 1992b The text was corrected

46 Comment
Vol I Appendix J Section J7 1 Toxicity Factors, Introduction Page J7-3 Here is a paragraph-long discussion of why DOE decided not to evaluate dermal exposure to PAHs This discussion is fine However, the underestimation of risks from dermal exposure to this class of chemicals must be assessed qualitatively in the uncertainty section There is a complete exposure pathway for several receptors

Response
A discussion of dermal exposure to PAHs was added to the uncertainty section

47 Comment
Vol I Appendix J Table J7-1 Toxicity Factors for Chemicals of Concern, Organic Compounds and Metals ECAO has derived a provisional inhalation RfC for tetrachloroethene of 0 4 mg/m^3 This number should be included in this table, and used in DOE's risk assessment calculations

Response
Provisional toxicity values for use in OU 2 and OU 6 were transmitted to DOE in a letter from Martin Hestmark to Steven Slaten dated October 7, 1994b (EPA, 1994b) The provisional RFC for tetrachloroethene was not included Due to the provisional nature of the toxicity estimate, the fact that it was not provided in a timely manner through appropriate channels, and because it is felt the risks due to inhalation of tetrachloroethene vapors is adequately characterized using the inhalation slope factor the provisional value was not added to the risk assessment

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48 Comment
Vol I Appendix J Section J10 0 Uncertainties and Limitations
Limitations of DOE's Uncertainty Assessment

- DOE did not qualitatively assess dermal exposure to PAHs
- DOE did not qualitatively assess potential inhalation toxicity of metals and semivolatile organics that had oral toxicity factors, but not inhalation toxicity factors Because these latter two classes of chemicals did not have inhalation toxicity factors, DOE has really only assessed the inhalation risks due to radionuclides, and ignored the risks from the other chemical classes
- DOE did not discuss the potential synergistic, antagonistic, or additive effects due to exposure to multiple contaminants, though it did add the carcinogenic risks and noncarcinogenic hazards A brief discussion also should be included in the uncertainty section

Response
Discussions of these issues were added into the uncertainly section

49 Comment
Vol II Appendix J Attachment J1 It would have made review of this document much easier if somewhere in this document DOE had listed the COCs present at each AOC in each media Some AOCs do not contain every COC in surface soil, for example

Response
This information is provided in Tables J5-1 through J5-13

50 Comment
Vol II Appendix J Attachment J1 Where is the table showing the pond surface water values for AOC No 3?

Response
As shown on Table J5-5, the only surface water COC for AOC No 3 is di-n-butyl phthalate The footnote indicates that the RME concentration (concentration term) is based on the maximum detected value Therefore, calculation of the 95% UCLs, which is what are presented in Attachment J1, are not needed for this chemical for this medium for this AOC, and there is no other table showing the pond surface water values for AOC No 3

51 Comment
Vol II Appendix J Attachment J1 Where is the data showing di-n-butyl phthalate in AOC 4 pond surface water?

Response
As with comment 50, please see Table J5-5

52 Comment
Vol II Appendix J Attachment J2 Page J2-1 Soil and Sediment Ingestion equation See comments No 39 and 41

Response
See responses to comment nos 39 and 41

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53 Comment

Vol II Appendix J Attachment J2 Table AT2-1 Neither CDPHE nor EPA toxicologists have agreed to the Central Tendency soil and dust ingestion rates of 10 mg/day for industrial workers and 5 mg/day for office workers The literature evidence does not support these low numbers, and neither does current EPA draft guidance, "Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure" (USEPA, 1993) In the EPA draft guidance, the central tendency value for adult workers is listed as 50 mg/day for both non-contact intensive industrial and office workers, and 100 mg/day for non-contact intensive RME industrial and office workers

Response

DOE supports the use of the CT values for soil ingestion by industrial and office workers as given in the exposure factors tables These values are based on information from peer reviewed publications (Finley and Paustenbach, 1994 and Gephart et at , 1994) In meetings held on December 12, 1994 and February 21, 1995, these CT values were not disputed by representatives of EPA and CDPHE Comments received by the agencies on the exposure TMs for OUs 5 and 6, and on the OU 2 RFI/RI report did not address these parameters These factors were not changed because they are reasonable estimates of CT values

54 Comment

Vol II Appendix J Attachment J2 Table AT2-8 footnotes How can 0 8 = 1-S_e be substantial and limited at the same time (footnotes 5 & 8)?

Response

Each of these footnotes refer to different exposed receptors, the first being indoor receptors and the second being outdoor receptors

55 Comment

Vol II Appendix J Attachment J3 Future Ecological Worker AOC No 3 inhalation of particulates from stream/dry sediment table Where does the 2 m^3/d Inhalation Rate come from? The Template lists an RME value of 1 4 m^3/hr or a CT of 0 83 m3/hr As a result of this incorrect factor, DOE did not calculate risks from inhalation correctly in these tables The correct risks for Am inhalation =8 68 E-13 and for Pu inhalation = 5 08 E-12

Response

Good question! The exposure factors table in Attachment J2 does list the above inhalation rates These risk estimates were revised

56 Comment

Vol II Appendix J Attachment J3 Future Ecological Worker AOC No 3 & 4 External irradiation from stream/dry sediment CT tables Where does the 0 019 EF come from? 65/365 days = 0 2, as listed in the Template Consequently, listed risks are incorrect

Response

The EF for the Future Ecological Worker listed in Table AT2-8 (0 2) is based on this receptor's exposure to surface soil at a frequency of 65 days/yr (65/365 = 0 2) However, the EF for the Future Ecological Worker in AOC Nos 3 and 4 is for exposure to sediments So, rather than use the 65 days/year, DOE used the exposure frequency for surface water (see Table AT2-5) for sediments to derive the percent of year exposed to external irradiation for RME, 12 days/yr/365 days/yr = 0 033, for CT, 7 days/yr/365 days/yr = 0 019 This is a logical approach since the receptor would be exposed to sediments for the same amount of time as to surface water

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57 Comment

Vol II Appendix J Attachment J3 Arsenic in Stream/Dry Sediment Open Space Recreational Use, AOC No 3 & 4 tables The CT Ingestion rate values used in this table's calculations are the old DOE proposed numbers which were rejected by both the State and the EPA These values are far too low, and should be replaced with the agreed upon values of 25 mg/day and 50 mg/day for adult and children soil/sediment ingestion respectively, and the risks recalculated The correct values were used in other tables for this pathway

Response

The ingestion rates used to estimate the CT risks from exposure to arsenic in stream sediments is incorrect and were changed to the correct values

58 Comment

Vol II Appendix J Attachment J5 Future Open Space Recreational Use Receptor, A Series Ponds, Pond Sediment Ingestion Table The values DOE lists for RME intake and carcinogenic risks from ingestion of sediment containing 0 105 mg/kg Aroclor-1254 are incorrect The correct values are, intake =5 87 E-9 mg/kgd, and risk = 4 52 E-8 DOE calculated its risk values using the unproved matrix factor

Response

These values were not changed See response to comment no 39

59 Comment

Vol II Appendix J Attachment J5 Future Ecological Researcher Receptor, A Series Ponds, Pond Sediment Ingestion Table Since the matrix effect was never approved, the correct RME intake factor should be 8 39 E-10 and the correct carcinogenic risk from pond sediment ingestion for Aroclor-1254 should be 6 78 E-10

Response

These values were not changed See response to comment no 39

60 Comment

Vol II Appendix J Attachment J5 Future Ecological Researcher Receptor, A Series Ponds, Dermal Contact with Pond Sediment Table The wrong exposure point concentration for Aroclor-1254 in pond sediment is listed on the RME table Instead of 2 047 mg/kg it should be 0 105 mg/kg

Response

This table was corrected

61 Comment

Vol II Appendix J Attachment J5 Page J5-3 Text on this page refers to Table J3-20 Where is this table? The tables in Attachment J3 are not labeled, and the concentration-toxicity screen for pond sediments does not show any uranium data Where is the uranium data?

Response

This reference is to Table J3-20 at the end of Section J3 0, Chemicals of Concern, in the main body of the HHRA It is unfortunate that the length and complexity of this document has created confusion in table, figure, and section numbering

Attachment B

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