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**U.S. DEPARTMENT OF ENERGY  
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**

**ROCKY MOUNTAIN REMEDIATION SERVICES, L.L.C.  
GOLDEN, COLORADO**

**DOCUMENT REVIEW: TECHNICAL MEMORANDUM NO. 1  
HUMAN HEALTH RISK ASSESSMENT FOR OPERABLE UNIT NO. 7  
ROCKY FLATS PLANT**

**GENERAL COMMENTS**

1. Exposure pathways are classified as being incomplete, complete significant, and complete insignificant. It may be premature at this time to say whether a given pathway is significant or insignificant without any quantitative data to back the statement up. Suggest that pathways are either considered complete or incomplete, and remove discussions of significance.
2. Ingestion of animal products might be considered as a potentially complete pathway, at least for the off-site scenario. There is at least one cattle herd downgradient in the vicinity of the plant. Please justify the exclusion of this pathway from the evaluation.

**SPECIFIC COMMENTS**

1. Executive Summary, p. ES-2, first paragraph, second sentence: This sentence states that the Colorado Department of Health have directed that the Phase I RFI/RI includes air pathways analysis. Presumably, this does not mean that air samples will be taken, but that air pathways will be based on releases from contaminated soils. The same comment applies to section 1.0, p. 1-1, fourth paragraph. Please clarify.
2. Section 1.2, p. 1-2, fourth paragraph: This paragraph classifies exposure scenarios as being significant, insignificant, or negligible. However, section 3.4 classifies scenarios as being improbable, plausible, or credible. Section 4.3.1 refers to exposure pathways as being significant, insignificant, or negligible. Please rectify these inconsistencies.
3. Section 2.2, p. 2-4, Fig. 2.2: It would be useful to include an insert on this figure that shows where OU7 is located within the plant boundaries.
4. Section 2.2.2, p. 2-8, second paragraph: This paragraph states that the "overflowing and/or discharging" of two ponds (Pond #1 the West Landfill Pond and Pond #2 the East Landfill Pond) located next to the landfill will be detoured by the "periodic spraying of water in areas adjacent to the landfill to enhance evaporation." These ponds were constructed as an interim measure to interrupt any leaching generated by the landfill. It is unclear why potentially contaminated water from these ponds would be sprayed on "clean" areas. If the water from the ponds is analyzed before it is sprayed to determine the extent of contamination, please clarify. If not please clarify why potentially contaminated water is being sprayed on clean areas.
5. Section 2.5, p. 2-14, top of page: Figure 2-6 is a stratigraphic column rather than a surficial geology map as stated here. A surficial geology map of the immediate vicinity of the site

would be appropriate here as well as the stratigraphic column. Recommend that such a map be added.

6. Section 2.7, pp. 2-23 - 2-27: The discussion on the ecology of the site is limited to descriptions for the Rocky Flats Plant as a whole. Please add descriptions pertinent to OU7 itself if information is available.
7. Section 3.1, p. 3-4, third paragraph: This paragraph discusses drinking water supplies for surrounding populations. Please state where the Rocky Flats Plant obtains its water supplies.
8. Section 3.3, p. 3-20, Table 3-3: It is unclear why future offsite agriculture is only plausible and not credible. Please clarify.
9. Section 3.5, p. 3-23, Table 3-4: Footnote 1 does not appear to accurately describe the reason for quantifying on-site residential risk. Please clarify.
10. Section 3.5.2, p. 3-26, first paragraph: The arguments for not doing an assessment of current on-site workers is presented in the section entitled future on-site workers. Recommend that the discussion of the current on-site worker be presented in a separate, appropriately-titled section.
11. Section 4.1, p. 4-1: The Inactive Hazardous Waste Storage Area is not included as a potential source. Please justify why this is omitted; otherwise, include this source in the exposure assessment.
12. Section 4.5.2, pp. 4-6 - 4-13: Repeatedly in this section it is stated that the Conceptual Site Model (CSM) indicates that such and such a release mechanism is or is not significant. This appears to be reverse logic. The CSM is not supposed to be used to draw conclusions about what is and what is not significant. Rather, site-specific information is used to make these judgements, which are then incorporated in the CSM. Please reword.  
  
In addition, this section prejudices the significance of all the pathways considered, even those that will be carried through the risk assessment. The significance of most of the pathways, e.g. inhalation or dermal contact, will depend on contaminant concentrations and on contaminant-specific properties. If contaminant concentrations are high enough and contaminant properties are right, some of the pathways said to be insignificant here could well be very significant. Recommend that no a priori judgement be made on the significance of pathways that will be carried through the risk assessment.
13. Section 4.5.2.1, p. 4-7, fourth paragraph: The arguments against considering plant uptake from soil by plants are not convincing. The first bullet appears to limit the discussion to

metals, when there is no basis for excluding organic compounds. The third bullet is incorrect: plant-soil concentration factors are larger than 1 for many organic compounds. Recommend that uptake from soil to plants be carried through the risk assessment.

14. Section 4.5.2.2, p. 4-8 - 4-9: It is not clear what type of on-site worker is being evaluated (e.g., office, construction, remediation, etc.). Please clarify.
15. Section 5.1.1, p. 5-3: The ecological researcher scenario involves exposures for 1 day/week for 50 weeks/year over 25 years. Without knowing exactly what the type of research that is planned, it is difficult to judge these exposure assumptions. However, given the nature of the typical ecological field research project, it seems more reasonable to assume more frequent exposures over shorter durations (e.g., 5 days/week during the field season for 7 years). For reasons discussed on p. 5-2, first paragraph, this won't make much difference for carcinogenic effects. It will provide a more realistic and conservative evaluation for non-carcinogenic effects.
16. Section 5.1.2, p. 5-4, last bullet: It is stated that chemical-specific absorption factors will be used to determine how much of the inhaled VOCs are actually absorbed into the body. This may not be necessary, because most of the EPA's toxicity values are expressed as administered, rather than absorbed, doses or concentrations.
17. Sections 5.1.6 and 5.1.7, pp. 5-8 - 5-9: The discussions for internal radiation in section 5.1.6 refer to the traditional method for evaluating radiation risks using dose conversion factors. This method is different from EPA's current methodology using slope factors. Section 5.1.7 states that the EPA's slope factor will be used for evaluating external radiation. Slope factors are also available for internal exposures to radiation via ingestion and inhalation. Therefore, it is not clear why different methods are used for internal and external radiation. Please be consistent.
18. Section 5.1.7, p. 5-9, second paragraph: It is not clear what is being attempted by the equations here or why risk is being introduced into the equations. Please revise and clarify.