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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 HANFORD PROJECT OFFICE  
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September 14, 1995

Arlene C. Tortoso  
100-KR-2 Operable Unit Manager  
U.S. Department of Energy  
P.O. Box 550 H4-83  
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RE: EPA Comments on "Appendix K: 100-KR-2 Operable Unit Focused Feasibility Study" DOE/RL-94-61, Draft A

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Dear Ms. Tortoso:

Enclosed are comments provided by the U.S. Environmental Protection Agency (EPA) on the above document. If you have any questions, please contact me at (509) 376-9884.

Sincerely,

*Laurence E. Gadbois*

Laurence E. Gadbois  
100-KR-2 Operable Unit Manager

Enclosure:

EPA Comments on "Appendix K: 100-KR-2 Operable Unit Focused Feasibility Study" DOE/RL-94-61, Draft A

CC:

Dave Holland, Ecology  
Alan Krug, Bechtel Hanford  
John L. Murphy, DOE  
Administrative Record (100-KR-2 Operable Unit)



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Arlene C. Tortoso

Enclosure

September 14, 1995

EPA Comments on "Appendix K:  
100-KR-2 Operable Unit Focused Feasibility Study"  
DOE/RL-94-61, Draft A

## General Comments:

1. The CERCLA Phase III feasibility study document must contain scope and cost information for the waste sites. This element is missing from this document.
2. There is a smattering of approaches that are not consistent with the 100-BC-1, 100-DR-1, 100-HR-1 ROD and initial RD/RA discussions for that ROD. This FFS should be revised to be consistent with those items.

## Specific Comments:

3. Page K1-1, Section 1.1, 1st paragraph  
The document indicates that "potentially impacted river sediments near the 100 Area...are being addressed under the remedial field investigation/corrective measures study pathway of the Hanford Past Practice Strategy". In fact, the river sediments are addressed as part of the Columbia River Comprehensive Impact Assessment (CRCIA) which is not intuitively located within the HPPS, and hence the reference to the HPPS could create confusion. Suggest replacing the HPPS reference with a CRCIA reference.
4. Page K2-1, Section 2.1, 1st paragraph
  - (A) The document states that "The 100-KR-2 Operable Unit comprises the area south of the 100-KR-1 Operable Unit and includes both the 100-KE and 100-KW Reactors and associated facilities". The correctness of this statement is notable in that associated facilities with the reactors includes the fuel storage K-basins. Since they contain and have been, are currently, and will continue to release CERCLA hazardous substances to the air and the groundwater, they are a CERCLA waste site within the operable unit.
  - (B) However, this message is not carried into the second paragraph of this section. The second last sentence states that this operable unit "contains most of the sites" and lists examples without mentioning the fuel basins. The fuel basins need to be added to this sentence.
  - (C) In a related issue, the Tri-Parties have recently been engaged in discussions regarding writing several proposed plans to encompass the rest of the 100 Area waste sites. The K basins and their content are addressed via M-34 milestones within the Tri-Party Agreement. We recommend that the contaminated soil beneath the basins be addressed as a radioactive liquid waste disposal site. The contaminated soil in this waste site should be included in

the scope of the currently envisioned "all remaining radioactive liquid waste disposal sites" proposed plan.

5. Page K2-1, Section 2.1, 3rd paragraph  
In order to keep the K-Basins issue clear in this document, the last sentence of this paragraph should be removed and replaced with something like the following: "~~The basins are not covered in this FFS.~~ Removal of material from the K basins is currently addressed via M-34 milestones within the Tri-Party Agreement. The structure of the K basins will be addressed in the D&D program. Remedial actions for the contaminated soil beneath the K basins is addressed within this document." (And then this scope needs to be added to this document.)
6. Page K2-5, 1st paragraph, 2nd sentence  
Suggest replacement with something like the following: "Sites that are not recommended for an IRM will be addressed during ~~future final~~ remedy selection process for the entire 100-Area, or through the D&D program.
7. Page K2-5, 3rd paragraph, 1st sentence  
A "future" residential scenario would involve residents at that future time with contaminant levels at that future time. The risk evaluations are supposed to use current contaminant levels using a hypothetical **current** residential scenario. The word "future" should be replaced with the word "current".
8. Page K2-5, 6th paragraph  
The document states that "If an IRM is not decided on, the site will be subject to further investigation and/or remediation under the site-wide RI/FS process". In fact, if a site is not identified for an IRM, its remedial future or disposition could be decided in a multitude of ways, one of the less efficient would be to go through a site-side RI/FS process. We are interested in the flexibility for something more efficient to be retained.
9. Page K2-5/6, last paragraph of section 2.3  
The paragraph begins by stating that the LFI/QRA was used to determine IRM candidacy, yet the paragraph closes with the statement that conclusions drawn in this FFS are also based on section 6.0 of this document. Since the LFI/QRA generated risk threshold numbers that are dramatically different than the threshold numbers in section 6.0 (based on MTCA level B, etc.) it becomes unclear which set of numbers was used to determine IRM candidacy. As of this letter (September 14, 1995) the Tri-Parties are finalizing the cleanup criteria for the first 100 Area Record of Decision and the ROD is more akin to section 6.0 of this FFS than the LFI/QRA. Since that is the planning basis for the cleanup levels for 100-KR-2, that should be a planning basis for IRM candidacy for 100-KR-2. The FFS document should be consistent with this approach.
10. Table K2-13, footnotes (b), (c), and (d)

This document sites itself for reference. A more precise reference should be used (e.g. table KA2-2 for (c)).

11. Tables K2-4, K2-5, K2-6  
These tables indicate the result of threshold comparisons of maximum contaminant concentration with the PRG. If no data is available to compare with the PRG, the result under the "Screening" column should be something like blank or don't know. Currently the default is "no" which is not appropriate. Note that the footnote to the table indicates that "no" means the value is below the PRG.
12. Page K6-1, bullets in center of page  
These need to be updated to match the ROD. Also need to clarify that the 15 mrem/yr cleanup standard is based on a residential scenario.
14. Page KA1-5, 2nd last paragraph  
The product of the DQO meetings has resulted in determinations of cleanup strategy (sequence/timing). Thus it is appropriate material for the Administrative Record. It needs to be packaged such that it can be referenced by this paragraph, and can be located in the Administrative Record.
15. Page KA1-11, Section 2.8, 5th bullet  
The risk number should be provided.
16. Page KA1-12, Section 2.8.2, 1st paragraph  
The document states: "The exposure pathways considered in this exposure scenario were developed in cooperation with the 100 Area Tri-Party Agreement unit managers (DOE/RL 1995b). These exposure pathways were soil ingestion, inhalation of fugitive dust, and external exposure to radiation." In fact, the exposure pathways identified in DOE/RL-91-45 Rev 2 (and DOE/RL 1995b) also includes: (1) dermal contact with soil (identified as a primary pathway), (2) inhalation of volatile emissions, (3) groundwater exposure via direct ingestion, inhalation of volatile contaminants, and dermal contact, and (4) biota pathways such as ingestion of fish, garden produce and home-grown fruit. These pathways, as defined in DOE/RL 1995b for qualitative risk assessments, should be included.
17. Page KA1-13, Section 2.8.2, 2nd paragraph  
Please see previous comment regarding the need for analysis of the biota pathways.
18. Page KA1-13, Section 2.8.3  
In the last approved version of HSRAM (Rev. 2) the exposure pathways that are to be used in the qualitative ecological evaluation for the pocket mouse are (HSBRAM, Rev 2, Section C.2.2.2, DOE/RL-91-45):
  - Soil ingestion
  - Fugitive dust inhalation
  - Inhalation of volatile organic from soil

Ingestion of water, and  
External radiation exposure

The FFS document identifies that ingestion of vegetation and external whole-body doses are the only pathways that were evaluated. A scientific basis that indicates that the other pathways are not significant must be provided before they can be dropped from further evaluation.

Also, the results of ecological calculations are not apparent. The only results appear to be table KA1-10. Section 2.8.3 should reference where the results of the calculations are located.

19. Page KA1-28, 2nd paragraph, last line  
The text states that radionuclides were decayed to 1995 yet table KA1-9 indicates 1992. This should be corrected, presumably to 1992.
20. Page KA1-23, Section 3.1.4.1, last paragraph  
Regarding the 116-KW-1 Condensate Crib, the document states that "Based on the above comparison, the potential for contaminant migration to groundwater is judged to be medium". We would judge it to be high for the following reasons: (1) Carbon<sup>14</sup> concentrations in the soil are about 7800 times higher and tritium 525 times higher than the threshold identified as posing a risk to groundwater. (2) The two highest human health risk-driving contaminants in the 100-KR-4 operable unit are tritium and carbon<sup>14</sup>, and 99.8 percent of the ecological risk from radionuclides in the groundwater came from carbon<sup>14</sup>. And the carbon<sup>14</sup> came from the 116-KE-1 and 116-KW-1 Condensate Crib and was detected in the downgradient wells from each of these cribs (at very high concentrations) (see for example figure 4-4 in the 100-KR-4 LFI). We therefore disagree with the assertion that the potential for contaminant migration to groundwater is "medium", when in fact it has already migrated into the groundwater resulting in very high groundwater concentrations.
21. Page KA2-9, Section 2.2  
In this description of general methodology, the document states that "Human receptors are assumed to be able to come into direct contact with soil to a depth of 5 m (15 ft)". However, actual analysis of the waste sites seems to have used a different criteria. All of the following presumably have unacceptable levels of contaminants within the top 15 feet, yet were dismissed as inaccessible for surface exposure to humans or ecological receptors: 116-KW-2 French Drain, 120-KE-2 French Drain, 120-KW-2 French Drain. This discrepancy needs to be fixed.
22. Page KA2-9  
Although not detailed in part 1, the ecological receptor was also to be evaluated for exposure to waste from anywhere in the top 15 feet. Although we currently do not have residential humans on the waste sites, we evaluated the waste site for cleanup purposes as if there were residential humans on the site. The same

approach applies to ecological receptors. If DOE stops application of herbicides to these site, (and driving over them with vehicles, etc.), vegetation will invade and the mouse will follow. Many of the waste sites, however, were dismissed as a surface ecological concern due to lack of vegetation. Both the ecological (and human - previous comment) risk methods need to be evaluated for consistency between the stated methodology and that actually used for the evaluation of each waste site.

23. Page KA2-9, Section 2.1, 1st paragraph, last line  
The phrase "in Section 2.3 I.of" should be "in Section 2.3 of".

24. Page KA2-10, Section 2.3  
The document states the following that will be discussed in the following two comments:  
"As discussed in the LFI/QRA, risk-based concentrations addressing terrestrial biota were not calculated. These concentrations were not calculated because (1) they would be applicable only to single organisms, not populations or communities, and could potentially misstate the nature of ecological impact associated with contaminants in soil and (2) terrestrial biota generally are considered less sensitive to exposure to radionuclides compared with humans".

25. Page KA2-10, Section 2.3, 2nd paragraph  
One of the reasons that risk-based concentrations addressing terrestrial biota were not calculated was that "they would be applicable only to single organisms, not populations or communities". If single organisms are protected, then the population is protected. Thus single-organism based numbers are useful for population or community effects.

Secondly, the statement in the document illustrates a misunderstanding of the purpose of the mouse assessment. The mouse is the "canary in the coal mine" for all the ecological receptors. The point is not if the individual mouse is at risk. Rather, the individual mouse is used as an indicator for other species and for potential risk to the community or population with which it belongs. To not have ecological receptors used in the calculation of risk based concentrations is not appropriate. This needs to be changed.

26. Page KA2-11, first paragraph  
The document states: "For radionuclides, the concentration corresponding to  $1 \times 10^{-6}$  is based on occupancy of a site in the year 2018; radioactive decay occurring from 1994 to 2018 is considered in developing the risk-based concentration for radionuclides". This statement should be corrected to correspond to the 100-BC-1 / 100-DR-1 / 100-HR-1 ROD currently in preparation. That ROD states that cleanup criteria are met at the time of the cleanup action, not at 2018. This needs to be promulgated throughout the document.

27. Page KA2-11, and KA2-20  
EPA 1993 is used as the reference for slope factors. The EPA has recently revised slope factors for radionuclides. Please see: "Health Effects Assessment Summary Tables: FY-1994 Supplement No. 2", EPA/540/R-94/059 PB94-921102, November 1994.
28. Page KA2-14, Table 2 (Parameters in Summers Method)  
This topic was discussed during a June 14 and subsequent meetings, and several recharge rates were the recharge rates were discussed, the lowest of which was 0.5 cm/year. Discussions on the thickness of the aquifer to use for dilution purposes in defining cleanup levels has centered around 15 feet. The 100-KR-2 FFS should be consistent with the general 100 Area approach in this regard.

A larger concern with this general approach is that this calculation of protectiveness of groundwater assumes that future human uses will not apply any water to the soil. In an unrestricted future use, such as irrigation or watered lawns and trees in a residential scenario, these infiltration parameters are not appropriate. The cleanup plan is to support unrestricted land use. This would allow people to apply water in such a way that the 0.5 cm/year assumption is invalid. This needs to be addressed.