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Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

JUL 10 1997

Mr. Steve M. Alexander
Perimeter Areas Section Manager
Nuclear Waste Program
State of Washington
Department of Ecology
1315 W. 4th Avenue
Kennewick, Washington 99336-6018

Dear Mr. Alexander:

TRANSMITTAL OF FINAL RESPONSES TO COMMENTS ON DOE/RL-97-22, DOE/RL-95-111, DOE/RL-96-39, DOE/RL-96-102, AND DOE/RL-97-30

Attached are final responses to comments on the following documents:

- DOE/RL-97-22, Engineering Evaluation/Cost Analysis for the 100-N Area Ancillary Facilities and Integration Plan, Draft A 47351

These responses (Attachment 1) to State of Washington Department of Ecology (Ecology) comments document the agreement reached in the comment resolution meeting held on May 22, 1997, and have been incorporated into the Draft B.

- DOE/RL-95-111, Corrective Measures Study for the 100-NR-1 and 100-NR-2 Operable Units, Draft A 45962

These responses (Attachment 2) to comments from Ecology have been incorporated into the Revision 0. Based on the current project schedule, reproduction, and distribution of this report will be delayed until late July to allow time for the U.S. Environmental Protection Agency (EPA), Region X, to review the related proposed plan prior to the public review later this summer.

- DOE/RL-96-39, 100-NR-1 Treatment, Storage, and Disposal Units Corrective Measures Study/Closure Plan, Draft A 47178

These responses (Attachment 3) to Ecology and EPA comments have been incorporated into the Revision 0. Based on the current project schedule, reproduction, and distribution of this report will be delayed until late July to allow time for EPA Region X, to review the related proposed plan prior to the public review later this summer.

- DOE/RL-96-102, Proposed Plan for Final Remedial Actions at the 100-NR-1 Source Sites Operate Unit and the Interim Remedial Action at the 100-NR-2 Groundwater Operable Unit, Draft A 47353

These responses (Attachment 4) to comments from Ecology document the agreement reached in the comment resolution meeting held on May 22, 1997, and have been incorporated into the Draft B.

- DOE/RL-97-30, Proposed Plan for Final Remedial Action of the Treatment, Storage, and Disposal Units and Associated Sits in the 100-NR-1 Operable Unit, Draft A.

These responses (Attachment 5) to comments from Ecology document the agreement reached in the comment resolution meeting held on May 22, 1997, and have been incorporated into the Draft B.

If you want to discuss this matter further or require additional information, please contact me on 376-7142.

Sincerely,

David E. Olson, Project Manager
Groundwater Project

GWP:DEO

Attachments

cc w/attachs:
M. K. Harmon, EM-442
D. R. Sherwood, EPA
P. R. Staats, Ecology

cc w/o attachs:
G. C. Henckel, BHI

ATTACHMENT 1

RESPONSES TO ECOLOGY COMMENTS ON DOE/RL-97-22

Final Responses to Washington State Department of Ecology Comments on DOE/RL-97-22, *Engineering Evaluation/Cost Analysis for the 100-N Area Ancillary Facilities and Integration Plan*, Draft A

1. Page 2-2, last paragraph. Please replace the term "recreational (restricted)" with the scenario description "modified CRCIA Ranger scenario similar to a MTCA Method C industrial scenario".

   Response: Accept. The recreational (restricted) term was replaced with the "Modified CRCIA Ranger/Industrial" term. See page 2-2, last sentence.

2. Page 2-4, second bullet. The inclusion of the *N Area Final Project Program Plan [BHI 1997]* is not a valid reference. The current reference is the "N Reactor Deactivation Program Plan, Rev. 4, WHC-SP-0615, December 1993." Please revise the text to reflect the correct reference.

   Response: Accept. The text was revised to reflect that the information presented was based on the work in progress to update the WHC-SP-0615 document. The BHI 1997 reference was removed. See page 2-4, second bullet.

3. Page 2-4, fourth bullet. In order to provide clarity please add the non-contaminated to the text describing the administrative/mobile offices.

   Response: Accept. "Noncontaminated" was added to the text describing the administrative/mobile offices. See page 2-4, fourth bullet.

4. Page 2-9, second paragraph. The last sentence of this paragraph states that negotiations are continuing between USDOE and the Washington Public Power Supply System concerning the deactivation and D&D plans. Change Package M-16-96-07 requires the submittal of necessary CERCLA documentation to support a cleanup decision on the Hanford Generating Plant. This document is intended to fulfill that milestone. Please revise the text to reflect the commitment of the milestone.

   Response: Accept. The text was revised to reflect the commitment. See page 2-9, second paragraph.

5. Page 2-17, first and second paragraphs. Please add a description in these sections of the document to describe the 1701-NE and 1703-NE septic tanks. These units were added to Appendix C of the Tri-Party Agreement through the execution of Change Control number C-93-08. The associated costs and volumes for each of these units should also be added to appropriate sections of the document.

   Response: No change. The 1701-NE Guardhouse is addressed as site 100-N-41 in DOE/RL-95-111, *Corrective Measures Study for the 100-NR-1 and 100-NR-2 Operable*

Units, Draft A, and was not addressed in this EE/CA. 1703-NE Septic Tanks cannot be found in supporting documents, records, or databases. If the comment was intended to address 1703-N, this site is addressed as site 100-N-45 in DOE/RL-95-111, Draft A.

6. Page 4-3, fourth paragraph. The text states that costs associated with major repairs such as roof replacement are included. What is the estimated timeframe of the long term surveillance and maintenance compared with the predicted lifetime of the existing roof?

Response: No change. The text states that "no costs have been factored..... nor have costs associated with major repairs, such as roof replacement, been included." For the 100-N facilities, one of the transition conditions from deactivation to D&D is to ensure roofs of the facilities are free of roof leaks for a minimum of 5 years and deteriorated roof panels are repaired. This 5 year period allows for a roof assessment to be performed to determine whether or not the current roof meets the designed life of 20 years. If the roof does not meet the 20 year life, a cost/benefit analysis is performed to determine if the facility should be accelerated into D&D, or if the roof should be replaced. No changes were made.

7. Page 4-5, footnote number 5. Please remove the footnote from the document.

Response: Accept. The footnote was removed.

8. Page 5-2, fourth paragraph. The last sentence of the paragraph includes text which refers to the above referenced footnote and should therefore also be deleted from the document. Please revise the text accordingly.

Response: Accept. The text that reflects the referenced footnote was deleted.

9. Page 5-4, first paragraph. Please include the specific regulatory citation dealing with the management of solid waste. It is WAC 173-304-461.

Response: Accept. The text was revised to identify WAC 173-304-460. See page 5-4, first paragraph.

10. Page 6-1, section 6.0. The recommended alternative, number four, does not adequately describe the ability of the alternative to comply with the applicable solid waste regulations. Therefore, Ecology cannot agree with the recommended alternative based on the current information.

Response: Accept. The text on page 4-5, Section 4.5, second paragraph was revised to confirm that the alternative will comply with the substantive requirements of WAC 173-304-461. The text was revised to clarify that:

(1) During demolition of the buildings and structures, inert uncontaminated and decontaminated rubble and other miscellaneous structural material

would be allowed to fall into the sublevel empty floor and thus fill void spaces in the below-grade structures.

(2) The bottom of the below-grade structures are approximately 30 feet above the groundwater level, thereby precluding contact between the groundwater and disposed inert/demolition waste.

(3) Upon completion of decontamination and demolition activities, a minimum one foot soil cover will be placed over any remaining below-grade structures and inert/demolition waste disposal sites (as required by WAC 173-304-461(6)).

(4) Because only inert or decontaminated material will be disposed of in the below-grade structures, any infiltration that might occur would not result in the discharge of any toxic or hazardous constituents to the groundwater.

11. Page 7-2, second reference. Please replace this reference with the document described in comment number 2.

Response: Accept. See response to Comment 2.

12. Page A-2, third bullet. The last sentence of this paragraph is unclear. Please revise the sentence to clearly state that the path forward concerning the buffer zone sites is to provide the remedial alternative recommendation with this document. This will then allow early action on these sites should the opportunity occur but in no case later than the Interim Safe Storage action planned for the reactor building.

Response: Accept. Text was revised to include "this will allow early action on these sites and facilities should the opportunity occur, but in no case later than the ISS." See page A-2, fifth bullet.

13. Page A-2, fourth bullet. Please replace the words *institutional control* with the words, surveillance and maintenance.

Response: On page A-2 Institutional Control is a term associated with waste sites. Surveillance and maintenance is a term associated with facilities, not waste sites. Text regarding facilities was revised to state that the facilities in the buffer zone will be limited to S&M until a decision is made on the future of the 100-N Reactor.

The text regarding the waste sites was revised to state remediation activities of the waste sites in the buffer zone will not be conducted until a decision is made on the future disposition of the 100-N Reactor. See page A-2, fifth bullet.

14. Page A-8, second paragraph. The last sentence of this paragraph should be revised in a similar manner as that described in comment number 11.

Response: It is believed that the author of this comment meant to refer to page A-8 and Comment number 12. If the comment is referring to page A-8 and Comment number 12. see response to Comment 12.

ATTACHMENT 2

RESPONSES TO ECOLOGY COMMENTS ON DOE/RL-95-111

Final Responses to Washington State Department of Ecology Comments on DOE/RL-95-111, *Corrective Measures Study for the 100-NR-1 and 100-NR-2 Operable Units*, Draft A

1. Page ES-10, first paragraph, last sentence. This statement is not entirely representative of what may occur. Later in the document, statements are made that the manganese will reach the river at concentrations above MCL. The other constituents will rely on attenuation and the 1:1 mixing factor in order to "pose no problem at the groundwater/river interface".

   Response: Accept. The last sentence of the first paragraph on Page ES-11 was deleted.

2. Page ES-13, first paragraph, fourth sentence. Presentations of the draft findings of the Columbia River Comprehensive Impact Assessment (CRCIA) study indicate there is an impact from Hanford sources on the water quality of the Columbia River. The data set used in this document, 1991-1995, does not represent a conservative approach to conditions which are present at the N Area, particularly during periods of high river stage.

   Response: Accept. Section 3.3.3.4 was added to present new data and discuss the impact on the existing database used for the report.

3. Page ES-14, top of page, first sentence. The sentence would be more accurate by reading as follows, plants and animals may still be exposed to tritium, Sr-90, and other contaminants of concern at riverbank springs and at the groundwater/river interface.

   Response: Accept. The text on page 14, paragraph 2, second sentence was modified.

4. Page ES-15, top of page, last sentence. The sentence would be more accurate by reading as follows, the hydraulic controls would reduce the flux of Sr-90, tritium and other contaminants of concern form discharging into the river.

   Response: Accept. The text on page 15, paragraph 2, last sentence was replaced with: "The hydraulic controls would be used to reduce the flux discharging into the river during that time period."

5. Page ES-16, first paragraph, fifth sentence. The text indicates that a backup alternative would be implemented should soil flushing not proceed. The document does not indicate what this backup alternative is or what decision logic would be used to arrive at a conclusion.

   Response: Accept. The text on page 16, paragraph 3, fifth sentence was modified to say: "... a backup alternative, such as one of the other alternatives described in the CMS, would be implemented."

6. Page 1-2, last paragraph. The Ecology project manager for the 100-DR operable unit is unaware of the transfer of this waste site (100-N-20) to the 100-DR-2 operable unit. Until this issue is resolved please include the site within the 100 NR ½ operable unit Corrective Measures Study (CMS).

Response: No change. This site exists in WIDS as 100-N-20 and 100-D-36. It belongs in the D Area, and this disposition was made when the sites were evaluated. "Transfer" was a poor choice of words and will be corrected. This site has been evaluated and identified as one of the 100-Area Remaining Sites and is being addressed as site "100-D-36" by that program.

7. Page 1-4, first paragraph, last sentence. The appropriate remedial alternatives will be selected which coincide with the agreed upon cleanup scenario for both the land and groundwater at 100 N Area.

Response: Accept. The text on page 1-4, paragraph 1, last sentence was modified.

8. Page 3-2, last paragraph, first sentence. Please provide verification that 100-N-46 is in fact an above ground diesel storage tank. Include the leak test data as an appendix to this document.

Response: Accept. This tank is an underground tank and this notation was corrected in the text on pages 3-75, 3-89, and elsewhere as appropriate. The reference to the leak test data was deleted from the text.

9. Page 3-3, fifth paragraph. Please identify which waste group the six sanitary sewer systems have been included in.

Response: No change. These sites were not put into any waste group because they did not contain contamination.

10. Page 3-5, fourth paragraph. Please include the N Springs area as a source site within the radioactive waste group. Include the appropriate site map, expected remediation volumes, costs, and ARAR/CERCLA/NEPA text.

Response: Accept. The river shoreline was included as a distinct waste site in Section 8.0.

11. Page 3-15, number 5. Please provide examples of constituents which are generally non-toxic in soil along with text which demonstrates those constituents which have been excluded under this criteria are specifically non-toxic under the conditions which exist at 100 N.

Response: Accept. The text on page 3-17, item 5 was modified as follows: "Constituents that are generally non-toxic in soils at low concentrations. These include

ammonia, chloride, fluoride, nitrate, phosphate, and sulfate. The MTCA Method B values for these constituents, in cases where values are available, are higher than concentrations expected in the 100-N Area."

12. Page 3-31, third and fourth paragraphs. Please include the MCL for Chromium VI and the maximum concentrations observed at 100 N Area. The existing data is probably sufficient to define the chromium plume at N Area.

Response: No change. Adding this information would be out of context. The maximum Chromium VI concentrations are given two pages earlier and MCLs are not discussed until Section 4.0. The most restrictive regulations are noted for protection of the river and groundwater in Tables 4-3 and 4-4, respectively. As noted on Page 3-34, paragraph 2, next to last sentence, a VI plume cannot be defined.

13. Page 3-32, third and fourth paragraphs. Please include the highest observed concentrations for manganese and nitrate and their MCLs.

Response: No change. Adding this information would be out of context. The information on nitrate and manganese are included earlier in Section 3.3.3.2.

14. Page 3-33, fourth paragraph. Although the paragraph is correct it does not represent the complete representation of conditions in the area. Well 100-N-99A, which is immediately adjacent to the seep wells, was monitored in May 1996 with a concentration of Sr-90 of 19,000 pCi/L. Please add text which describes the effects of high water on the N Springs water quality and the concentrations of contaminants which have been detected in the general area.

Response: Accept. Same as response to Comment 2.

15. Page 3-33, Section 3.3.5. See comment number 2.

Response: Accept. Same as response to Comment 2.

16. Page 3-40, third paragraph. Please include the soil boring data from the wells/sample boreholes which were drilled in support of the sheet pile wall in this document. This information can then be used in support of the concept that the N Springs area is not only a groundwater issue but is also a source site.

Response: Accept. This data was included in Section 8.0 as part of the data supporting the river shoreline site.

17. Page 3-41, last paragraph. Please revise the text to delete the 100 year floodplain reference as there is no such designated area at 100 N Area.

Response: Accept. This section was rewritten as part of the river shoreline and is in Section 8.0. As noted in the last paragraph of Section 8.1, the reference to the 100 year flood was changed to the 300 year flood.

18. Page 3-42, Figures. Please add a figure which delineates the N Springs area as a source site. Ensure the map is to scale and is really specific so as to clearly identify the area of interest.

Response: Accept. See Figure 8-1.

19. Page 3-54, Figure 3-11. Please add a figure or revise the existing figure to show the high river stage reached in 1996.

Response: Accept. The figure was revised to show a "typical" high river stage.

20. Page 3-60, Figure 3-17. Please extend the time and elevation plot to include the levels experienced during 1996.

Response: Accept. Same as response to Comment 2.

21. Page 3-69, Figure 3-26. I am not sure what the purpose of this figure is as Figure 3-19 represents the tritium plume in the area.

Response: Accept. This figure was deleted.

22. Page 3-70, Table 3-1. Please revise the table to include all of the Solid Waste Management Units (SWMU) identified at the Hanford Generating Plant. Those which are missing are SWMU #s 2 (oil storage area), 3 (floor drains, sumps, piping to settling pond/outfall), 4 (turbine oil filters), and a subset of 11 (miscellaneous radioactive/lead/asbestos equipment). Please include the outfall structure at the Hanford Generating Plant as a source site in the document.

Response: Accept. These sites do not fit the definition of waste sites as used in the CMS but were added for completeness. These are not CERCLA sites and they will be addressed in the *Engineering Evaluation/Cost Analysis for the 100-N Area Ancillary Facilities and Integration Plan* (DOE/RL-97-22).

23. Page 3-83, Table 3-3. Please add the delineated N Springs area to this table.

Response: Not Accept. All discussion of the River Shoreline Site was put in Section 8.

24. Page 3-109, Table 3-23. The travel times and concentrations at the river represented in this table represent a best case scenario not a conservative case. They do not take into account the effects and resulting concentrations which occur during high river stage. Either revise the table to include high river stage effects such as those experienced in

1996 or add a table which includes these concentrations with their travel times and predicted river concentrations. Please ensure the well distances from the river in the table are consistent.

Response: Accept. This was addressed qualitatively as part of the response to Comment 2.

25. Pages 3-110/112, Figures 3-24 and 3-25. See comment number 2.

Response: Accept. Same as response to Comment 2.

26. Page 4-18, third paragraph, first and second bullets; last paragraph. Please quantify these two generic criteria. Please provide justification for deleting chromium VI, iron, and manganese from the list of COCs at the river.

Response: Accept. Discussion was added to Section 4.5.2.2.

27. Page 4-22, Table 4-2. Please revise the PQL for chromium VI to be consistent with the sampling and analysis plan for 100-BC, 100-DR, and 100-HR which is 0.1 mg/kg. Ensure the other PQLs listed in the table are consistent.

Response: Accept. Table 4-2 was modified.

28. Page 4-25 , Tables 4-5 and 4-6. Please add the following text to the "*" footnote, "It is anticipated that sampling will be required to verify cleanup has been achieved and that contaminants left in place are not migrating."

Response: Accept. This was added as part of footnote "b".

29. Page 5-23, fourth paragraph, third sentence. Delete the text which states, "This strip of land should not be physically remediated because of the potential for significant ecological and cultural impacts."

Response: Accept. This was deleted from Section 5.2, paragraph 2.

30. Page 5-25, first paragraph. Please add clarifying text which explains to the reader that 96% of the total Sr-90 flux above 8 pCi/L is being reduced. Reference the Performance Evaluation Report (DOE-RL-95-110, Rev.0, which states on page 6-4 that the net effect of the current system (190 L/min) is reducing the Sr-90 flux and the total cumulative discharge to the Columbia River by 73 percent.

Response: Accept. The text on page 5-2, paragraph 3, second sentence was modified to say, "...that by interchanging Well N-105-A with Well N-103-A, and increasing the pumping rate to 227 L/min (60 gal/min), flux towards the river could be reduced by at least 90 percent."

31. Page 5-26, first paragraph. Assuming the text of the previous comment and the Performance Evaluation Report are correct, what additional flux would be addressed by the five additional wells described by this paragraph?

Response: Accept. This paragraph is mislocated in the text and was deleted. The five wells noted are for groundwater treatment and not for hydraulic control.

32. Page 5-37, end of Section 5.2. Please add a summary paragraph which states which alternatives are carried forward.

Response: Accept. This text was added to Section 5.2.6.

33. Page 5-51, second and third paragraphs. See comment 30 and 31. Is it 70% of the total flux as stated in the Performance Evaluation Report, and if so, why is there a need beyond the interchange of well N-103A with well N-105A to achieve 96% reduction in the total Sr-90 flux to the river? Of what benefit are the additional five wells?

Response: Accept. This comment was addressed in Section 5.4.4 by using the same language provided in response to Comment 30. As noted in response to Comment 31, these wells are for groundwater treatment and not hydraulic control.

34. Page 5-57, first paragraph, last sentence. The soil flushing alternative also contains an impermeable barrier whose purpose is to prevent impact to the river should the extraction system fail. Please revise the text to reflect this benefit.

Response: Accept. This was added to page 5-53, second paragraph, last sentence.

35. Page 5-57, last bullet. Please include the time frame for the soil flushing system which was used in the conceptual model and cost analysis.

Response: Accept. Text was added to page 5-53, last bullet.

36. Page 5-59, Figure 5-1. Please add the barrier wall to the figure such that the figure accurately represents the alternative.

Response: No change. This figure illustrates the generic description of soil flushing and is not related to the specific alternative in the text.

37. Page 6-8, Section 6.2. There are significant differences between the residential and recreational scenarios particularly with regard to overall protection of human health and the environment, compliance with ARARs, long term effectiveness and permanence, and reduction of toxicity, mobility, or volume. Please provide separate evaluation text for each cleanup scenario discussed in the document.

Response: Accept. Separate evaluations were included as Sections 6.2.2 and 6.2.3.

38. Page 6-33, top of page, last paragraph. The statement that no alternative is expected to significantly decrease the time necessary to achieve river protection standards from the estimated 270 years is true with the possible exception of the soil flushing/barrier alternative. Please revise the text to reflect this possibility.

Response: No change. In this context the statement is correct. It relates contamination in the banks and river shoreline and this would be unaffected by any of the alternatives.

39. Page 6-34, second paragraph, first sentence. Risks to ecological receptors are being evaluated as part of the CRCIA. Please revise the text to reflect that this study is in progress. Please replace the words, a long time, with an estimated 270 years.

Response: Accept. The text was modified to reference the CRCIA in a new paragraph on page 6-51, paragraph 2. Additionally, the words "a long time" were replaced with "about 270 years" on page 6-51, line 2.

40. Page 6-35, Reduction of Toxicity, Mobility, or Volume. The processes described will not render the site risk free in 300 years. Manganese will remain a concern for 3000 years as discussed elsewhere in the document.

Response: Accept. The text on page 6-52, paragraph 3, last sentence was modified to say "These processes are expected to reduce risks to acceptable levels in about 300 years, with the possible exception of manganese."

41. Page 6-37, Implementability. See comment number 40.

Response: Accept. Same as response to Comment 40.

42. Page 6-38, Section 6.3.2.3. This alternative would result in a conflicting soil cleanup scenario should the rural residential cleanup alternative discussed in the document be chosen. It may also result in a conflict with the recreational scenario. Text should be added to the evaluation of this alternative which addresses the potential for this conflict and a path for its resolution.

Response: Accept. A new paragraph was added on page 6-55, paragraph 3, to address this.

43. Page 6-38, Long-Term Effectiveness. Please add text which describes what control technologies would be emplaced which would provide long-term control of risks to humans.

Response: No change. This paragraph notes that Institutional Controls will control risks to humans. These are described in Section 5.3.2.

44. Page 6-40, NEPA Values. The strip of land at the site of installation would also be irreversibly and irretrievably committed for 300 years.

Response: Accept. The text on page 6-57, paragraph 4, last sentence was modified.

45. Page 6-41, second paragraph. Please specify in this description and for all of the pump and treat alternatives the percent reduction achieved and whether this reduction is deduced from the total contaminant plume above MCL or some fraction.

Response: Accept. The text on page 6-58, paragraph 4, first sentence was modified.

46. Page 6-58, Table 6-3. Please add the cost figure for alternative 7 (attachment 4-1 of this document) to the table. If necessary add a footnote which describes how/why this estimate is any more unreliable or uncertain than the other estimates provided.

Response: Accept. See Table 6-3.

47. Page 7-19, top of page, last sentence. Alternative 7 also possesses the potential of reducing the time frame needed to remediate the Sr-90. Please add text to this section which addresses this potential.

Response: No change. This is discussed in the next paragraph.

48. Page 7-21, Section 7.3.5. Do the cost estimates reflect treatment trains coming off-line as their remediation targets are complete (i.e., CrVI - 1 year, nitrate/sulfate/TPH - 5 years, manganese - 90 years)?

Response: No change. The costs were estimated for the actual period of time needed for remediation.

49. Page 7-22, last paragraph. Alternative 7 is estimated to cost $356M, not $400M. Please revise the text.

Response: Acccept. This paragraph was deleted from the text (page 7-22).

50. Page 7-27, Table 7-5. The footnote "a" indicates four sites which contain waste below 15' which may not be remediated under this scenario. Please list the four sites with a reference to the text which documents these four sites as not having an impact to groundwater, the Columbia River, or to human health and the environment.

Response: Accept. See Table 7-5.

51. Page 7-31, Table 7-9. Please add the costs for Alternative 7. See comment 46.

Response: Accept. See Table 7-9.

52. Page A-1, Section A.1. Please provide a summary page at the front of the section which lists all of the ARARs (sections A1- A7). An evaluation of the N Springs area as a source should be added to the section as should an evaluation for the permeable wall alternative due to its potential conflict with either cleanup scenario discussed in the document.

Response: Accept. The text was modified to add this on page A-1, paragraph 2.

53. Page A-2, Containment for Radioactive Waste Group. Please provide text which explains how this alternative complies with MTCA B or MTCA C.

Response: Accept. The text on page A-3, paragraph 3 was modified.

54. Page A-6, Waste Management Standards. Please add the transportation regulations found in 49 CFR.

Response: Accept. The text on page A-7, paragraph 2 was modified.

55. Page A-15, Groundwater Alternative Compliance with ARARs/TBC. Restoration time frames may extend to 3000 years. Please revise the text accordingly.

Response: Accept. The text on page A-16, paragraph 4, sentence 3 was modified.

56. Page E-3, second paragraph, fourth sentence. Please revise the text to state, ...would not have received any hazardous substances, including radionuclides, , and that the system was closed in compliance with state regulations....

Response: Accept. The text on page E-1, paragraph 4, fourth sentence was modified.

57. Page E-14, first paragraph, last sentence. Please revise the text to state, ...in accordance with WAC 173-303-090; and no radionuclides have been detected at this site, therefore, it was redesignated as no action.

Response: This paragraph was deleted from the text.

58a. Page G1-1, Appendix G1. What is the discount rate used to calculate the present worth value of the alternatives?

Response: Accept. The discount rate is presented on pages G1-22 and G2-2.

58b. There are no efficiencies gained from addressing the sites in remedial units. Categories 01 and 02 are applied as if a single site were being remediated at a time.

Response: Accept. There are many uncertainties in the assumptions associated with these cost estimates including how the sites will be contracted for remediation. No attempt was made to factor this into the estimates.

59a. Page G1-A1-5. Why are the costs for line 08 and 70 virtually equivalent?

Response: No change. There is no relationship between these two cost categories. Cost 08 is the actual excavation cost and Cost 70 is 15 percent of the direct cost for management.

59b. Why is there a cost to the project in line 18?

Response: No change. This is the ERDF disposal cost.

60. Page G1-A2-9, item 9. What analytical services are being purchased for $4,210.00 per sample?

Response: The text presented for the description of MCACES was updated to reflect recent changes and appears as Appendix G-1, Attachment 2, page G1-42. This cost item represents sending 10 percent of all samples to an offsite laboratory for quality control.

61. Page G2-4. Where are the costs for excavation/removal of the removed soil?

Response: No change. These are included as part of the "Install Clino Wall at the River" cost. This is detailed in the cost backup.

62a. Page G2-5. In the second line item, O&M the 200 gpm pump & treat for 270 years, what materials are being purchased for $313,251 and what amount of labor is provided for $818,876?

Response: No change. This information is detailed in the cost backup.

62b. Are the pump & treat alternatives automated systems?

Response: No change. The systems are automated in the sense that they can self-adjust and self-balance. It is set up to trigger alarms when needed. An operator still needs to complete a daily, one hour surveillance.

62c. Isn't injection well maintenance/cleaning/5 years included in O&M (operations and maintenance) the 200 gpm pump & treat for 270 years?

Response: No change. These are separate items in the estimate.

63. Page G2-8, blank. Please add the costs for Alternative 7 to this page.

Response: Accept. Costs were added on Page G2-8.

64. Page H-1, Introduction. Please revise the text to indicate that the Integrated Decommissioning and Remedial Action Plan is now being revised in the form of an

Engineering Evaluation/Cost Analysis to be used in the decision making process for the 100 NR ½ IROD.

Response: This appendix was deleted.

65. Page H1-1. Please add the N Springs area to the list of source sites.

Response: This appendix was deleted.

66. Page H2-3, Executive Summary. See comment number 64.

Response: This appendix was deleted.

67a. Page I-A1-1, Attachment 1. Please have this attachment reviewed by, Mr. Jeff Serne of PNNL, and include his evaluation and comments regarding the testing which was performed along with recommendations for the path forward.

Response: Accept. Dr. Serne provided new input to Section 5.2.4.3.

67b. Order of magnitude cost estimates and time frames for these recommendations should also be included in the text.

Response: This appendix was deleted.

ATTACHMENT 3

RESPONSES TO ECOLOGY AND EPA COMMENTS ON DOE/RL-96-39

Final Responses to Washington State Department of Ecology Comments on DOE/RL-96-39, *100-NR-1 Treatment, Storage, and Disposal Units Corrective Measures Study/Closure Plan*, Draft A

1. Page ES-2, Waste Unit Descriptions. This section does not currently include narrative describing the hazardous waste constituents discharged to the 116-N-1 and 116-N-3 cribs. Please include text which discusses these discharges.

   Response: No change needed. Text on pages ES-3 and ES-4 describes the hazardous waste constituents.

2. Page ES-5. second paragraph. Please add clarifying text to this paragraph which states that no COCs of concern were identified based on the sampling effort which was conducted.

   Response: Accept. See page ES-5, second paragraph for clarified text.

3. Page ES-10, first paragraph. Please revise the first sentence of the paragraph to state that 120-N-1, 120-N-2, and 100-N-58 are on a modified clean closure pathway. There is a groundwater plume associated with these units which require monitoring and a remedial alternative decision in the future.

   Response: Accept. It was agreed that wherever closure is discussed in the document it will discuss "modified" closure.

4. Page 1-7, Figure 1-2. Please revise this figure or present a separate figure which includes the sitewide permit modification step which will be taken on these units.

   Response: The figure was removed. This figure was taken directly from the Hanford Past Practice Strategy Document. It was not intended to show the sitewide permit steps, but the steps identified in the document.

5. Page 2-15, second paragraph. The statement is made that the records do not indicate a discharge of radionuclides to these units. Include text which references the LFI data on these units regarding radionuclides.

   Response: Accept. Reference to the document presenting the LFI data was included, see page 2-15.

6. Page 2-17, second paragraph. The text states that the COPC list does not include all dangerous waste constituents to be evaluated for closure. Why not? Which dangerous waste constituents have been omitted? Please include all dangerous waste constituents on the COPC list which will be required during the evaluation for closure of these units.

Response: No change. Methanol is the "only" constituent that was left off the COPC list. Text on page 2-17, Section 2.5, second paragraph provides discussion on why methanol was left off the COPC list.

7. Page 2-19, paragraph 3.a. Please provide a definition in the text of the term "internally consistent".

Response: Accept. On page 2-19, paragraph 3 was revised to provide further clarification/explanation intended by the use of this term.

8. Page 2-39, Figure 2-28. This figure is not accurate. There is no header box connecting the distribution laterals to the main distribution trough. Please revise the figure.

Response: No change. The figure was developed according to the as-built drawings.

9. Page 4-2, first sentence. Ecology has not arbitrarily or otherwise agreed to a date of 2010. Please delete this sentence from the document.

Response: Accept. The sentence was deleted, see page 4-2.

10. Page 4-4, fourth paragraph. The text states that since there is no surface soil present at 116-N-1 and 116-N-3, there are no COCs. The remainder of Section 4.3.1.1, titled, Radionuclides in Surface Soils, discusses the samples collected from the surface soils at these units and COCs found there. Please delete the inconsistent sentence.

Response: Accept. The text has been revised to delete the inconsistent sentence. See page 4-4, Section 4.3.1.1, last paragraph.

11. Page 4-11, last paragraph. The text states that although it is anticipated that pipelines will be encountered during remediation of the 116-N-3 trench, they are not expected to require remediation. On what basis has the assumption been made that the pipelines will not require remediation?

Response: Accept. The text was revised to clarify the pipeline remediation and the basis for that assumption was added. See page 4-1, last sentence.

12. Page 6-11, **Short Term Effectiveness**. A total person-rem exposure number is given based on two hypothetical remediation start dates. Please provide a separate exposure estimate for each disposal unit using the same remediation start dates. Please include text which discusses the assumptions used to derive the exposures including those predicted to be experienced by the MEI.

Response: Accept. Appendix H, Figure H-1 provides the estimated exposures for 116-N-1 and 116-N-3, separately and includes the same start dates. Additionally,

Appendix H provides the assumptions, and methodology used to generate the exposure rates. The text was revised accordingly to add the assumption and methodology used to generate the exposure rates. See page 6-11, section 6.2.2.5.

13. Page 6-7, **Short Term Effectiveness**. See comment number 12.

Response: Accept. See response to comment number 12. Text revisions made on page 6-17, Section 6.2.3.5.

14. Page 6-30. Please include a discussion in this chapter of those actions which occur at the 1324-N and 1324-NA facilities.

Response: No changes were made to this section because the source sites would not need remedial action. Clean closure (meaning no remedial action to occur) was proposed for the 1324-N and 1324-NA sites. There are no contaminants of concern at these sites; therefore, the sites could clean close based on currently meeting MTCA-B standards. However, it was agreed that the sites would follow "modified closure" due to the groundwater being contaminated by sulfate.

15. Page 7-2, **Short Term Effectiveness**. See comment number 12.

Response: Accept. See response to comment number 12. Text revisions made on page 7-2, Section 7.1.5.

16. Page 7-5, **Short Term Effectiveness**. See comment number 12.

Response: Accept. See response to comment number 12. Text revisions made on page 7-5, Section 7.2.5.

17. Page 7-7, Figure 7-1. Please provide a separate figure for 116-N-1 and 116-N-3.

Response: Accept. Figure 7-1 was a graph that showed relative decrease in radiation with time. The same relative rates apply to both sites. Figure H-1 provides a graph showing the exposure with time for each site. Figure 7-1 was replaced with Figure H-1.

18. Page A1-2, Section A1.2. Please include a discussion of the modified clean closure option within this section.

Response: Accept. It was agreed that the 1301-N and 1325-N Closure Plan would reflect modified closure. The modified closure option is presented on Page A-3.

19. Page A1-3, last paragraph. Please revise the test discussing the closure of 1301-N and 1325-N as being clean closures. As the groundwater contamination which resulted from the discharges to these two units will not be remediated in the same timeframe as the proposed remediation of the surface soils (0-15') clean closure will not be accomplished.

What will be accomplished is a modified clean closure with the groundwater remaining an issue of resolution.

Response: Accept. See response to comment number 18.

20. Page A2-1, Section A2.2.1.2. There is no 100 year floodplain map for this region of the Hanford Reach. Please revise the text accordingly.

Response: Accept. Flood levels, including the 100-year flood, were determined as part of the project activities. See page A-6, Section A2.1.2 for revisions to the text.

21. Page A2-5, Section A2.2.1.5. Please revise the text to reflect the most recent Part A submittal which does not include the waste code U133.

Response: Accept. The text was revised to reflect the most recent Part A. See page A-12, Section A2.2.1.5, second paragraph.

22. Page A3-1, Section A3.2, second paragraph. The text states that an assessment program found no evidence that hazardous waste or hazardous waste constituents from 1301-N had entered the groundwater. This statement does not reflect the hazardous waste contamination which has been detected in the groundwater above MCL or other applicable regulation. This contamination is attributable to the 1301-N unit. Please revise the text to reflect that hazardous waste constituents, most notable of which is chromium VI have been detected in the groundwater under the 1301-N unit.

Response: Accept. The text was revised based on technical review of the RCRA groundwater system. See page A-15, first paragraph.

23. Page A3-5, first paragraph. Please add the following text to this paragraph. It is anticipated that groundwater cleanup will not be achieved to coincide with the remediation of the disposal units. Therefore, modified clean closure will result in a continued groundwater monitoring program until such time as remediation can be accomplished.

Response: Accept. The closure issue was discussed at a meeting on April 17, 1997. It was agreed that closure would be "modified" closure. The text on page A-21, Section A3.4.1 was revised to state that a final status groundwater monitoring program would be prepared.

24. Page A4-4, second paragraph, last sentence and a half. It is anticipated that verification sampling to determine MTCA direct soil exposure standard compliance will be required. Please revise the text to reflect the need for verification sampling.

Response: Accept. Text was revised to clarify verification sampling. See page A-27, Section A4.3.2, first paragraph.

25. Page A4-6, last paragraph. A start date for remediation of each disposal unit must be included in the document.

Response: Accept. Direction was received from RL on May 9, 1997, that the start date would be defined as: "Remediation of 1325-N will begin in 1999, within 15 months of the date of issuance of the ROD. Following the completion of remediation at 1325-N, remediation will begin at 1301-N." See page A-28, Section A4.9.

26. Page A4-8, Table A4-1. Please provide a separate duration schedule for 1301-N and 1325-N.

Response: Accept. A separate duration schedule was provided for 1301-N and 1325-N. See Table A4-1.

27. Page A5-5, Closure Contact. Please include the title of the official to be contacted on behalf of USDOE in the address.

Response: Accept. The information was added on page A-35, Section A5.6.

28. Page A-1-I, Attachments A-1, A-2 and A-3. Please include the fully executed copies of the attachments with the final submittal of this document.

Response: Accept. Fully executed copies of Attachments A-1 and A-2 was included. Approval of Attachment 3 is in progress. This checklist is noted as a draft checklist and that it will be approved by permit issuance.

29. Page B1-1, Section B-1. Since there will be groundwater contamination which resulted from the active use of these facilities which will not be remediated to coincide with the action on the surface soil units, clean closure will not be achieved. Please modify the text to reflect a modified clean closure of these units.

Response: Accept. The closure "issue" was discussed at a meeting on Thursday, April 17, 1997. It was agreed that the sites would be closed as modified closure. Appendix B was revised accordingly.

30. Page B1-2 first paragraph last sentence. The text does reference the section where the reader can find the alternative evaluation, cleanup standard, disposal option or characterization data for this activity. Please revise the text to indicate where this information can be found.

Response: Accept. The text was revised to reference Section B4.0 for details of the closure activities. See page B-2, Section B1.2, second paragraph, last sentence.

31. Page B1-3, first paragraph, last sentence. Shouldn't the sentence read as follows: If the system structures and piping *meet modified clean closure standards* after removal...? To state that materials which exceed standards will be buried is not acceptable.

Response: Accept. The text was revised to provide clarification. See page B-3, Section B1.3.3.

32. Page B4-1, Section B4.1. Please expand the text describing the physical actions to be taken at these units or provide a section within the CMS which accomplishes this, with a reference to it in Section B4-1.

Response: Accept. The text was revised. See page B-21, Section B4.1.

33. Page B4-1, Section B4.2. This section is inadequate for the purpose of a disposal decision to an on-site facility such as ERDF. Please see comment number 30.

Response: Accept. The text was revised. See page B-22, Section B4.2 and page B-30, Section B5.0

34. Page B5-1, Section B5.0. Clean closure of this unit will not be accomplished. This section should be revised to discuss closure under a modified clean closure scenario. Sulfate is a COC under MTCA.

Response: Accept. The text was revised to discuss modified closure. See page B-30, Section B5.0.

35. Page B6-1, first paragraph. Thank you for including a start for these units, however the date of October 1, 2010 warrants further discussion and is not acceptable at this time.

Response: Accept. The start date of October 1, 2010 was deleted. The section was revised to state that remediation of these units will begin within 15 months of signing the ROD. See page B-27, Section B4.8.

36. Page B-1-I, Attachments B-1, B-2, and B-3. See comment number 28.

Response: Accept. See response to comment number 28.

37. Page D1-1, third paragraph. A volume estimate and associated costs should be provided to account for the potential disposal of pipelines within the 1324N and 1324NA facilities.

Response: Accept. Section D3.0 addresses pipeline volumes. A volume estimate was provided for the potential disposal of the pipelines. See page D-1, fourth paragraph. A cost estimate was also added in Appendix E. See page E-4, Section E1.3.

38. Page D2-1, first paragraph. Volumes for the 1324N and 1324NA facilities need to be included.

Response: Accept. Volumes for these units were included. See page D-15, Section D2.1.

GENERAL COMMENTS

1. The recreational scenario used in this document is not a recreational scenario. It is a potential worker (Park Ranger) scenario. It is deceptive to call it a recreational scenario because people familiar with Hanford cleanup documents (and exposure/risk assessments) equate the recreational scenario with the recreational scenario in HSRAM. This deception is perpetuated by erroneous statements such as:

   Page ES-7, 2nd bullet "recreational exposure scenario...using exposure parameters and assumptions in the *Hanford Site Risk Assessment Methodology*".

   Page 3-14 to 3-15, Section 3.4.2.2 "protective of human receptors under a recreational exposure scenario...using exposure parameters and assumptions in the HSRAM".

   It is also a misnomer based on the general public current concept of recreational use of the Hanford Site. Most people equate recreational use of the Hanford site with recreational boating and fishing/waterfowl hunting along the river corridor. Yet the "recreational scenario" in the subject document excludes consumption of these animals because of the high dose that results from this pathway.

   Recommendation: Call the Ranger Scenario a Ranger Scenario, not a recreational scenario and identify it as a type of industrial scenario, or better yet use the standard industrial scenario from HSRAM.

   Response: Accept. Because future land use has not been determined, two exposure scenarios were presented in this CMS: rural-residential exposure scenario, and recreational exposure scenario. The rural-residential scenario used in the CMS is a slight modification of the residential, or frequent-use. scenario described in the HSRAM and is consistent with EPA's radionuclide soil cleanup standard. Additionally it is consistent with the unrestricted-use assumptions defined in the 100-Area ROD for the 100-BC-1, 100-DR-1, and 100-HR-1 OUs, and also with the rural-residential scenario found in the 100-Area RDR/RAWP. The recreational scenario used in the CMS was modified to omit the food-ingestion pathway. If the food-ingestion pathway was included in the modeling, the resulting PRGs would have essentially been the same order of magnitude as those required by the rural-residential scenario. Consequently, there would have been little benefit in examining a recreational scenario that included the food-ingestion pathway. Therefore, to present a distinctly different exposure scenario alternative, the recreational scenario was based on the Ranger scenario developed in the *Human Scenarios for the Screening Assessment, Columbia River Comprehensive Impact Assessment.* The Ranger scenario is very similar to the HSRAM industrial scenario except that the potential receptor is assumed to spend less time on site.

Text was revised to better define the scenarios and clarify the modeling process. The name of the scenario has been changed to the "modified CRCIA Ranger which is similar to the MTCA Method C industrial scenario" as defined in HSRAM.

2. The document states that (page 3-7) "Under the rural-residential exposure scenario, groundwater underlying the 100-N Area would not be used as a potable water supply for irrigation purposes for a period of time not expected to exceed 300 years". That is an unprecedented time scale to be considering institutional controls at Hanford, especially away from the 200 Area. That is inconsistent with years of stakeholder advice regarding restoration of beneficial uses of groundwater in the 100 Area. Also, there is no identified viable method for maintaining institutional control for 300 years? EPA's understanding is that Ecology does not support the concept of 300 years of institutional control.

   Recommendation: This document should reflect Ecology's position regarding institutional controls, and provide or make clear through reference that an analysis of risk without this extended institutional control has been conducted. The best alternative would be to remove the provision for 300 years of institutional controls.

   Response: No change. The 100-NR-1 and 100-NR-2 CMS addresses the groundwater remediation. The TSD CMS addresses only the TSD units and associated contaminated soil. However, relative to 100-NR-1 and 100-NR-2, the proposed interim action is to evaluate technologies which might be able to shorten the 300 year time frame. EPA has acknowledged, both in regulation and guidance, that use of institutional controls for 100 years may be both reliable and reasonable. A 300 year time frame is somewhat long relative to the acknowledged 100 year period; however, the fact remains that longer term control would be necessary if it turns out that there is no cost effective and implementable remediation technology capable of appreciably shortening this time frame. Such a conclusion would be premature at this time; the CMS properly states that no technology has been identified to date which would significantly shorten the remediation time and that further evaluation is planned.

   It should also be recognized that very long term institutional controls have been implemented by EPA in Region X in situations where no practicable remediation technology exists. The Bunker Hill ROD, for example, establishes institutional controls in conjunction with a clean soil barrier in residential areas to prevent exposure to underlying lead contamination. These institutional controls will require maintenance until such time as the underlying lead concentrations are no longer hazardous - a period with no definitive duration, but which will undoubtedly exceed 300 years given that lead will not decay or decompose and dilution to safe levels by natural processes will be very, very slow.

3. On page 3-6, the document states that "the MTCA C cleanup levels will be the basis for determining remediation requirements under the recreational exposure scenario". The concept of when MTCA C could be used is at WAC 173-340-706, or in a more abbreviated version (sufficient for this discussion) at WAC 173-303-700(3)(c):

Method C: Conditional method. Compliance with cleanup levels developed under the method A or B may be impossible to achieve or may cause greater environmental harm. In those situations, method C cleanup levels for individual hazardous substances may be established on the basis of applicable state and federal laws and a site-specific risk assessment. Method C cleanup levels may also be established at industrial sites... Where a hazardous waste site involves multiple hazardous substances and/or multiple pathways of exposure, method C cleanup levels for individual substances must be modified".

It appears that to entertain use of Method C cleanup levels, there needs to be a reasonable likelihood that:

(1) Method A or B cleanup levels may be impossible to achieve, which is hard to imagine under the norm for liquid waste sites in the 100 Area -- dig-and-haul.
(2) That there would be greater environmental harm removing the waste from the highly disturbed footprint of these waste sites vs leaving the waste to continue to dose the adjacent environment via the external dose emanating from these sites and release to the Columbia River via continued release to the groundwater.
(3) That the site-specific risk assessment would justify less remedial action.
(4) That despite years of stakeholder input, this area would be designated industrial with associated institutional controls for a very long time.

And lastly, this site does involve multiple hazardous substances with multiple pathways of exposure, so method C cleanup levels for individual substances must be modified (which was not appear to have been done in the subject document).

Recommendation: Do not use Method C cleanup levels.

Response: No change. The cited references in WAC 173-340-700 and -706 pertain to selection of MTCA Method C in lieu of Method A or B. In the case of the recreational scenario, there is no regulatory requirement imposing use of Method A, B, or C. Instead, cleanup requirements for the recreational scenario are established on a case-by-case basis, *and cannot be less stringent than Method C* (See WAC 173-340-740). Since the Method A, B, or C standards are not invoked (except, in the latter case, as a "cap") for a recreational scenario, rather are set on a case-by-case basis, the criteria listed in WAC 173-340-706 are not pertinent. Instead, the establishment of recreational cleanup standards must be based on evidence, pursuant to WAC 173-340-740(1)(a) that: (1) the property does not currently serve as a residential area; (2) the property does not have the potential to serve as a future residential area based on the consideration of zoning, statutory and regulatory restrictions, comprehensive plan, historical use, adjacent land uses, and other relevant factors; and (3) appropriate use restrictions are implemented at the property. (See "Concise Explanatory Statement [Responsiveness Summary] for the Model Toxics Control Act Rule Amendments Adopted January 26, 1996," Ecology publication no. 96-600, pages 46-47.)

One way to view this issue is to consider establishment of recreational standards at 95% of the Method C level. Such a limit would meet the requirement established in WAC 173-340-740 (assuming the demonstration in -740(1)(a) is made), and clearly would not invoke the criteria in WAC 173-340-706 since the Method C cleanup standard is not being selected.

Mr. Pete Kmet of Ecology's Toxic Cleanup Program is currently working with the MTCA Policy Advisory Committee. This committee is chartered with recommending changes to MTCA to make cleanups more effective. Mr. Kmet is very familiar with the cleanup standards for recreational land uses; the MTCA Policy Advisory Committee has recommended regulatory changes in this area. Mr. Kmet has confirmed that cleanup standards for recreational use are established pursuant to the requirements of WAC 173-340-740, and that Ecology does not use the WAC 173-340-706 criteria in this regard.

4. Biased language. Although better than a lot of Draft A documents we review, there are a number of inappropriate biases in the writing. Several examples are identified in the specific comments below.

Response: See specific responses below.

SPECIFIC COMMENTS

5. Page ES-7, 2nd bullet. The document states that "recreational exposure scenario...using exposure parameters and assumptions in the *Hanford Site Risk Assessment Methodology*". In fact, the document incorrectly (see comment # 18) uses a Park Ranger scenario.

Response: See response to comment number 1.

6. Page ES-8, last bullet. The document states "Prevent destruction of...". More accurately, this should be stated as "Minimize destruction of...".

Response: No changes were made. The statement presents one of the remedial action objectives for this TSD CMS. By nature, objectives qualify this as a goal which may or may not be obtained.

7. Page 2-5, section 2.3. In section 2.3.1, seven categories of information contained in the 100-NR-1/NR-2 CMS are identified, and then sections 2.3.2 through 2.3.2.2 recap some of the information from two of those seven categories but no recap of the information from the other categories is presented. There is no indication why the two categories (geology and hydrogeology) are important to recap, yet the other categories are not. A transition statement into section 2.3.2 is needed.

Response: Accept. A transition statement was added into the section. See page 2-5, last sentence.

8. Page 2-8, 1st paragraph, first few sentences. The document states that "The crib area is approximately...(12 ft) deep"..."The elevation of the bottom of the crib is...(450 ft) above Mean Sea Level (aMSL) and the surrounding grade is approximately...(455 ft) aMSL". This is confusing.

Response: Accept. The text was clarified. See page 2-8, first paragraph.

9. Page 2-10, 3rd and 4th paragraphs of Current Site Conditions. Switching of units in the following two statements is confusing: "radiation measurements...were about 300 mrem/hr"..."the background...ranged from 1 to 3 mRoentgen/hour". When appropriate consistent units should be used. (Note: there is a similar mix of units in the first paragraph of page 2-14. This suggests a global search through the document would be appropriate.)

Response: Accept. The document was checked to ensure that the appropriate unit of measure was used and was consistent.

10. Page 2-10, last full paragraph. The document states that "cobalt and cesium are external exposure concerns". Are they not also contamination concerns? Both this and the next sentence should be reviewed for accuracy.

Response: Accept. The section was reviewed for accuracy and was revised accordingly. See page 2-10, last paragraph.

11. Page 2-11, section 2.4.3, 1st paragraph. Suggest the following change "as a replacement for 116-N-1, which had ~~reached~~exceeded its disposal capacity".

Response: Accept. The text was revised. See page 2-11, Section 2.4.3, first paragraph.

12. Page 2-17, section 2.5, 1st paragraph. The document states that the "identification of COPCs was accomplished using an approach similar to the COPC screening process developed in the *Hanford Site Risk Assessment Methodology*". Later in section 2.5.1, 2nd paragraph it states that the "COPCs in the 100-NR-1 QRA are those contaminants that exceed an incremental cancer risk (ICR) of 1E-05 or exceed an environmental hazard quotient of one. It is not apparent in the subject document that the approach used in the QRA is 10 to 100 times less conservative that the process identified in the HSRAM. It misleads the reader to state that two processes that are 10 to 100 times different are "similar".

Response: Accept. The text was modified to remove the misleading information. See page 2-17, Section 2.5.

13. Page 2-17, section 2.5, 2nd paragraph. The document states that the "COPC list does not include all the dangerous waste constituents that will be required to be evaluated". OK. This introduces the reader to the idea that there are some ***unspecified*** number of

contaminants that are required to be carried through the full closure process even through they were dropped in a screening process. This prompts the reader to wonder how many and what these contaminants are. The paragraph, without answering the questions it prompted, launches into a discussion of methanol. Is methanol the only contaminant in the category? If so, perhaps rewrite the first sentence as "The COPC list ~~does not~~ includes all but one (methanol) of the dangerous...".

The next paragraph begins "the sulfate plume that is present in groundwater...". Is this a continuation of the previous paragraph that discussed methanol, and now the second contaminant is sulfate? This prompts the reader to wonder if sulfate is a dangerous waste under the WAC? Was it a risk driver?

Recommendation: This whole section 2.5 needs a little rework to be more up-front and clear to the reader.

Response: Accept. The text was clarified. See page 2-17, Section 2.5.

14. Page 2-44, figure 2-23.. The figure title is "General Topography at 116-N-3", yet there is no topo information in this figure. It is a figure of well locations and names.

Response: Accept. The figure was corrected to provide topographic information.

15. Page 3-5, 4th paragraph. The document states "Thus, for comparative purposes (e.g., to present contaminated soil volume/cost differences between potential land uses and remedial alternatives), a recreational scenario that does not include the food-ingestion exposure pathway is defined in this CMS. This scenario is the most conservative recreational, conceptual exposure model evaluated that does not include the food-ingestion pathway".

See general comment # 1, regarding this so-called "recreational scenario". In fact this is a Park Ranger scenario (had it been calculated correctly) which is more akin to an industrial use exposure scenario. Both of the recreational scenarios within the Columbia River Comprehensive Impact Assessment (where the Park Ranger scenario originated) involve ingestion of food and water from the site. In fact, the two potential land uses evaluated in this CMS are rural-residential and something somewhat akin to industrial. Note too that the CRCIA document calculated risks for the Park Ranger and the standard Industrial worker, and the risks were similar.

"This scenario is the most conservative recreational, conceptual exposure model evaluated". In fact it was the ***only*** so-called "recreational" scenario evaluated in the CMS. Statements such as "the most conservative" should be removed.

Response: Accept. See response to comment number 1. Section 3.3 was revised accordingly.

16. Page 3-5, last paragraph. The document states that "for the purpose of the TSD CMS, it is assumed that the groundwater will not be used as a potable water supply or for irrigation purposes, in order to be consistent with the same decision in the 100-NR-1/NR-2 CMS". It is important to note that what 100-NR-1 and 100-NR-2 did is not consistent with the rest of the 100 Area, where the exposure scenarios from HSRAM was used, including the ingestion pathway.

Response: Accept. See response to comment number 1. Section 3.3 was revised accordingly.

17. Page 3-7, section 3.3.1.3, 1st paragraph. The document states that "The Ranger scenario was selected to represent an individual who spends time in all habitat areas on a regular basis and thus would reflect a median recreationally exposed individual". Note the previous comments about the Ranger scenario as not representative of a recreationally exposed individual. If parameters for a median recreationally exposed individual is desired, the Columbia River Comprehensive Impact Assessment project has defined parameters for an avid and casual recreational user, including ranges on many of the exposure parameters. These would provide a solid foundation on which to interpolate a "median recreationally exposed individual".

Response: Accept. See response to comment number 1. Section 3.3 was revised accordingly.

18. Page 3-7, last few lines. The document states that the Ranger scenario that should be 150 days per year has been converted to 37.5 days per year. This is immediately a reduction in risk of a factor of 4. This CMS Range scenario is not the Ranger scenario from the CRCIA project, and should not make statements to that effect.

Response: See response to comment number 1. Section 3.3 was revised accordingly.

19. Page 3-13 through 3-15. A number of examples of biased language in the risk discussion is evident here. On page 3-13, in discussing the use of 0.1 rad/day for terrestrial animals and 1 rad/day or plants, the document states that "Use of these values for individual receptors within a population is believed to be highly conservative". Does Ecology believe these thresholds are ***highly conservative***? In general the individual representatives for the Natural Resource Trustee organizations for the Hanford site do not consider these highly conservative values.

On page 3-15, section 3.4.2.3, 2nd paragraph several additional biased statements are presented. Landeen et al 1993 is cited as a reference for the statement "Field studies at the Hanford Site have found no evidence suggesting impacts to the natural wildlife populations and communities as a result of toxic inorganic contaminants". See the attached letter (EPA letter from L. Gadbois to E. Goller, DOE and J. Donnelly, Ecology dated December 2, 1993) regarding the legitimacy of the 1993 document with regards to conclusions of impact. An example of the bias in the 1993 document was the comparison

of contaminants among different media derived from different areas, such as the comparison of raptor scat from the horn area to soil from the 200 area's 2101-M pond -- to determine that lead concentrations were not much different.

The statement "ecological exposure to most inorganic contaminants is expected to be limited because...most metals do not tend to bio-accumulate" applies a sweeping generalization for which there are many exceptions. Such a generalization is inappropriate where there are COPCs which are among the exceptions.

Response: The text was revised to state "conservative" rather than "highly conservative." However, the 0.1 rad/day limit for terrestrial animals was recommended by the International Atomic Energy Agency (IAEA) in a 1992 report. In 1994, DOE convened a team of experts in radioecology and ecological risk assessment to evaluate standards for protecting terrestrial plants and animals. The working group concluded that the 0.1 rad/day limit was protective of terrestrial animals and that this dose limit should be applied to representative individuals from populations of terrestrial organisms, *and not to maximally exposed individuals.* (See 61 Federal Register 6800.)

In contrast to this intended application of the standard, the Great Basin pocket mouse exposure scenario used in the CMS assumes: (1) the pocket mouse spends its entire lifetime within the confines of the waste site, (2) all of the pocket mouse's food is derived from contaminated plants, (3) the exposure is continuous (365 days/year), (4) the contaminant concentration is at the maximum representative concentration from LFI and historical data sets, (5) the maximum representative concentration is uniformly distributed throughout the waste site, and (6) the contaminants are 100% bioavailable. These are very conservative assumptions resulting in an exposure akin to a maximally exposed individual exposure rather than exposure to a representative individual in a population, the latter being the intended exposure scenario for comparison to the 0.1 rad/day recommended standard. In order to quantify the degree of conservatism inherent in the assumptions used it would be necessary to develop an exposure scenario based upon a representative individual of the population. Rather than attempting this, the CMS qualitatively notes that this methodology is "conservative." Representing use of the 0.1 rad/day standard as conservative based on the maximizing exposure assumptions is an appropriate characterization of the situation given that the standard was not actually intended to be applied to the maximally exposed individual.

ATTACHMENT 4

RESPONSES TO ECOLOGY COMMENTS ON DOE/RL-96-102

Final Responses to Washington State Department of Ecology Comments on DOE/RL-96-102, *Proposed Plan for Final Remedial Actions at the 100-NR-1 Source Sites Operable Unit and Interim Remedial Action at the 100-NR-2 Groundwater Operable Unit*, Draft A

1. Page 1, first paragraph, third sentence. Please delete the word unconfined from the sentence.

   Response: Accept. The sentence on page 1, paragraph 1, line 10 was revised to delete this word.

2. Page 1, fourth paragraph, first sentence. Please add the word State after the word Washington.

   Response: Accept. The sentence on page 1, paragraph 4, line 2 was revised to add this word.

3. Page 1, notification box, last sentence. Please replace the word hearing with the word meeting.

   Response: Accept. The sentence on page 1, right column, second paragraph in box, line 3 was revised.

4. Page 1, last paragraph. Please add the following heading prior to the beginning of the last paragraph: **Soil Waste Sites.**

   Response: Accept. This heading was added to the top of page 2.

5. Page 3, fourth paragraph, first sentence. Please replace the term recreational, with modified CRCIA Ranger scenario similar to the MTCA C industrial scenario. This change in wording should be consistent throughout the plan.

   Response: Accept. Throughout the remainder of the document, the terms "recreational scenario" were replaced with "modified CRCIA Ranger/Industrial scenario."

6. Page 4, first sentence. The sentence refers to the remedial action goals however they are not included in the text. Please include text which defines the remedial action goals.

   Response: Accept. The text was revised on page 6, right column, second paragraph.

7. Page 4, first paragraph, last sentence. Please revise this sentence as follows, "...beneficial uses of the Columbia River", *designated a Class A river*, and provide a definition in the Glossary of Class A designation.

Response: Accept. The text on page 4, left column, next to last line was modified and the term was added to the glossary.

8. Page 4, second paragraph. Please add the following heading to the top of the second paragraph: **Groundwater Site.**

Response: Accept. The heading was added to page 4, top of right column.

9. Page 4, last paragraph, last sentence. The text states that the CMS did not identify other contaminants of concern (COC) as presenting a significant risk to human health or the environment in the short term. This sentence is somewhat misleading, the CMS was not intended to identify COCs, that is the purpose of the LFI/QRA which in this case was limited. As work progresses and as other studies are conducted such as the CRCIA, COCs which do pose a significant risk to human health and the environment may be identified. Please delete this sentence from the text.

Response: Accept. This entire paragraph was deleted in response to other comments.

10. Page 5, first paragraph, first sentence. Please revise this paragraph to read as follows:

Insufficient information exists to make a final remedy decision for Sr-90; therefore, Ecology, the EPA, and the DOE propose to select Pump and Treat as the preferred interim remedial alternative. The Pump and Treat System (as recently modified and restarted in December 1996) has been in operation since September 1995 at the 100-NR-2 Operable Unit under the **N-Springs Expedited Response Action** and associated **Action Memorandum**. It removes Sr-90 contaminated groundwater, treats it by **ion exchange**, and returns treated groundwater to the unconfined aquifer using up gradient injection wells. The preferred alternative for the interim will also provide hydraulic control over movement of Sr-90 and other contaminants to the Columbia River and will not preclude possible final remedies at this operable unit or the source sites operable unit.

Response: Accept. This sentence has been modified on page 5, first paragraph.

11. Page 5, last paragraph, fourth sentence. Please revise this sentence to read as follows, This process will also satisfy the public involvement requirements for the RCRA sites.

Response: Accept. The sentence on page 5, right column, last paragraph, line 15 was modified.

12. Page 6, fifth paragraph, second sentence. Please revise the sentence to read as follows, ..."remedial action selected for the 100-NR-2 Operable Unit, the preferred ***interim*** remedial alternative for the shoreline site, Institutional Controls, ~~may~~ ***will*** be reevaluated when a final remedial action for groundwater is selected.

Response: Accept. The sentence on page 6, right column, paragraph 3, lines 11 and 12 was modified.

13. Page 6, last paragraph, first sentence. Please revise the sentence to read as follows ..." because the sites are located *within 50 ft.(the buffer zone) of* ~~next to~~ the N Reactor.

Response: Accept. The text on page 8, first paragraph, first sentence was modified.

14. Page 6, last paragraph, last sentence. Please revise the sentence to read as follows: The proposed remedial alternative for these sites has been included in this plan. This will then allow early action on these sites should the opportunity occur but in no case later than the Interim Safe Storage action planned for the reactor building.

Response: Accept. The text on page 8, paragraph 1 was modified to add these sentences..

15a. Page 8, first paragraph, fifth sentence. Please revise the text as follows, "The development of mitigation plans **in conjunction with the Natural Resource Trustee Council** to address site-specific...."

Response: Accept. To be consistent with the 100 Area ROD, the text on page 8, paragraph 2, lines 13-15 were modified.

15b. Page 9, footnote number 1. Please delete this footnote from the document.

Response: Accept. The footnote was deleted.

16. Page 10, fourth paragraph, second sentence. Please revise the text as follows, ..." until treated to meet acceptance criteria. ~~or a treatability variance or waiver is approved.~~

Response: Accept. The text on page 10, paragraph 6, sentence 2 was modified.

17. Page 11, fifth paragraph, last sentence. Please revise the text as follows, ..."meet the remedial action objectives under the ~~stated future land use assumption,~~ **rural residential land use.**

Response: Accept. The last sentence in paragraph 1, right column, page 11 was replaced.

18. Page 13, last paragraph, second and third sentences. The institutional controls alternative may be protective of human health however would not be protective of ecological receptors. Information contained in the Screening Assessment and Requirements for a Comprehensive Assessment, (DOE/RL-96-16, Rev. 0) indicates a current impact to ecological receptors at the 100-N Area shoreline.

Response: The CRCIA Screening Assessment does not conclude that there is a current impact to ecological receptors, rather that contaminant levels "pose a **potential** risk to human health and ecological receptors **under some scenarios,** and **may warrant further investigation."** The report acknowledges that "the overall potential impact on the riparian ecosystems is not known," and that the screening assessment is a "limited assessment" to be used "to indicate whether the issues under study warrant further investigation." (Id., page xiii.)

Based on this understanding, the first 3 sentences, right column, paragraph 3, page 13 were replaced with the following: "The draft Columbia River Comprehensive Impact Assessment Screening Assessment indicates that contaminant levels in the 100-N Area may pose a potential risk to human health and ecological receptors under some scenarios, and that further investigation may be warranted. The No Action Alternative provides no control of exposure to the contaminants at the shoreline site, and thus provides no protection from potential risks. The Institutional Controls Alternative would provide protection of human health by preventing exposure to contaminants for an interim period, during which time potential ecological impacts and human health risks could be further evaluated."

19. Page 14, first paragraph, second sentence. The institutional control alternative would not comply with ARARs. It is therefore misleading to state that it *may or may not* comply.

Response: Accept. The text on page 13, last paragraph, sentence 2 was modified.

20. Page 14, second paragraph, third sentence. See comment number 19.

Response: Accept. The text on page 14, first paragraph, third sentence was modified.

21. Page 15, Table 2. Please provide the costs for all alternatives.

Response: Accept. The costs were added to Table 2.

22. Page 15 {16}, third paragraph, last sentence. Please revise this sentence to read as follows, ..."it renders the groundwater unusable for nearly 300 years and presents a potential human health and environmental threat... ."

Response: Accept. The text on page 15, first paragraph, last sentence was modified.

23. Page 16, second paragraph, fourth sentence. Please replace the word phenomena with the word properties.

Response: Accept. The text on page 17, line 9 was revised.

24. Page 18, last paragraph. The conclusion of this paragraph is misleading and conflicts with the findings of the document referenced in comment number 18. The text should be revised to reflect new information as it is being gathered.

Response: Accept. The text on page 18, right column, second paragraph, last sentence was modified.

25. Page 19, **Institutional Controls for Groundwater Remediation and River Protection (Interim and Final Action),** last sentence. Ecology does not agree with this sentence. Using institutional controls as a final action would necessitate a 300 year implementation of this alternative. Ecology does not consider this to be appropriate. Please delete this sentence from the document.

Response: Accept. The acceptability of long term institutional controls is an issue which can be addressed, if necessary, as part of the final remedy selection for 100-NR-2, and need not be an issue in this Proposed Plan. The text on page 19, left column, was modified to delete this sentence.

26. Page 21, fourth paragraph. The preferred alternative is pump and treat. The last sentence of paragraph should be deleted as to operate in the hydraulic only mode would require a waiver of WAC 173-218.

Response: Accept. The paragraph was deleted from page 21.

27. Page 21, last paragraph. It is not anticipated that the current contamination levels in the groundwater and in the seeps at 100-N Area will decline to levels below MCL during the interim action period of 5 years. Therefore this paragraph should be deleted from the document.

Response: Accept. The paragraph was deleted from page 21.

28. Page 22, second paragraph, first sentence. Please revise this sentence as follows. ..."while the pump and treat system ~~for hydraulic control~~ continues to operate...."

Response: Accept. The text on page 21, last paragraph, first sentence was modified.

29. Page 22, **Evaluation of Sr-90 Impacts to Aquatic and Riparian Receptors.** The text describes work which is currently under the scope of the CRCIA project. There is no need to duplicate this effort at the 100-N Area. USDOE and Ecology agreed to involve stakeholders in an effort to evaluate final remedial actions for the shoreline and the groundwater operable unit. Please revise the text appropriately.

Response: Accept. The text under this heading on page 22 has been replaced.

30. Page 22, last paragraph, third sentence. Please delete the text within the parenthesis.

Response: Accept. The text was deleted from page 22, right column, paragraph 1.

31. Page 22, Evaluation of Alternatives for 100-NR-2. Please delete the text in this section dealing with final action evaluation. The recommended preferred alternative is an interim action.

Response: Accept. The text throughout this section (pages 22 - 26) was revised to eliminate the text associated with the final action evaluation.

32. Page 23, sixth paragraph, last two sentences. Please delete the last two sentences of this paragraph from the document. Ecology is not interested in approving a waiver of the regulations.

Response: Consistent with the language in the 100-HR-3 and 100-KR-4 Operable Unit ROD, the text on page 22, right column, paragraph 5 was modified.

ATTACHMENT 5

RESPONSES TO ECOLOGY COMMENTS ON DOE/RL-97-30

Final Responses to Washington State Department of Ecology Comments on DOE/RL-97-30, *Proposed Plan for Final Remedial Action of the Treatment, Storage, and Disposal Units and Associated Sites in the 100-NR-1 Operable Unit*, Draft A

1. Page 1, fourth paragraph. Please revise the term recreational to be consistent with the description agreed to for the NR1/2 proposed plan. The inclusion of text which defines each of the scenarios would be helpful to the reader.

   Response: Accept. The text throughout the document was revised to remove the term "recreational scenario" and replace it with "modified CRCIA ranger/industrial scenario.".

2. Page 3, second paragraph, last sentence. Please revise the sentence as follows, "...to meet land disposal restrictions ~~or~~ and the Environmental Restoration Disposal Facility (ERDF) waste acceptance criteria.

   Response: Accept. The sentence was revised. See page 3, left column, third paragraph, last sentence.

3. Page 3, third paragraph, second sentence. Please revise the first sentence of the paragraph to state that 120-N-1, 120-N-2, and 100-N-58 are on a modified clean closure pathway. There is a groundwater plume associated with these units which require monitoring and a remedial alternative decision in the future.

   Response: Accept. The sentence was revised to reflect modified closure. See page 3, right column, first sentence.

4. Page 3, sixth paragraph. Please insert text which discusses the modification of the Site Wide Permit to include the units discussed in this plan.

   Response: Accept. The text was added. See page 3, right column, last three sentences.

5. Page 4, first paragraph, fourth sentence. Please revise the sentence to read as follows, "The ~~ROD~~ CERCLA public involvement process must satisfy the public involvement requirements for the RCRA sites.

   Response: Accept. The sentence was revised. See page 4, left column, last paragraph, fourth sentence.

6. Page 4, second paragraph. Please move paragraph 10 on page 7 to this location in the plan.

   Response: Accept. The paragraph was moved to the recommended location in the plan. See page 4, right column, third paragraph.

7. Page 4, sixth paragraph. Please reference the LFIs which contain the data which produced the list of contaminants of concern.

Response: Accept. The LFIs were referenced. See page 7, left column, second paragraph.

8. Page 7, second paragraph. Please expand the paragraph to explain the basis of the last sentence.

Response: Accept. The paragraph was expanded to explain the basis of the last sentence. See page 7, right column, first paragraph.

9. Page 7, eighth paragraph. Please expand the paragraph to include the history of 100-N-58 and what happened to the contaminants associated with this unit.

Response: Accept. The paragraph was expanded to include the history of 100-N-58. See page 8, left column, second paragraph.

10. Page 7, last paragraph. Please include text which discusses the on-going groundwater monitoring program which will occur.

Response: Accept. The text was added. See page 8, left column, fourth paragraph.

11. Page 8, first paragraph, fifth sentence. Please revise the sentence as follows. "The development of mitigation plans in consultation with the Natural Resource Trustee Council to address...."

Response: The sentence will be revised to read as follows: "The development of mitigation plans with input from the Natural Resource Trustee Council to address....". See page 8, right column, first paragraph.

12. Page 9, first paragraph. Please add text to this section which discusses the ongoing groundwater monitoring program which will occur.

Response: Accept. The text was added. See page 10, right column, first paragraph.

13. Page 9, footnote 2. Please delete this footnote from the plan.

Response: Accept. The footnote was deleted.

14. Page 10, second paragraph, last sentence. Please add acetone and cadmium to the text on page 4 which discusses contaminants of concern.

Response: The sentence was deleted from the text. For nonradiological chemicals, an acute or chronic toxicity value, regulatory criterion, or the NOAEL is used to assess risk

ans serve as the benchmark for calculation of EHQs. An EHQ at or above 1 (exceeding or meeting the benchmark) would indicate a potentially measurable risk. For nonradiological chemicals, the EHQ is calculated by dividing the concentration of the contaminant at the exposure point by the benchmark value.

The *Qualitative Risk Assessment for the 100-NR-1 Source Operable Unit* was reviewed to determine the logic used in developing the EHQ values for acetone and cadmium. This review concluded the NOAEL values used were inaccurate. The NOAEL values used were taken from a *Site Wide Characterization Report* from the US DOE site at Fernald, Ohio. This reference is questionable. A commonly used reference for NOAEL is the *Toxicological Benchmark for Wildlife*. The EHQ for acetone and cadmium was recalculated using the recommended reference. The EHQ for acetone was determined to be 0.027 and for cadmium 0.144. Both were below the EHQ of 1.

Additionally, the data for acetone was questionable when it was qualified as a result of contamination in the blanks, indicating that the detections may have been the result of laboratory contamination. Therefore, these contaminants would not be considered an ecological risk.

15. Page 10, fourth paragraph. Please add text which states that both scenarios restrict the use of the groundwater.

Response: Accept. The text was added. See page 11, left column, first sentence.

16. Page 10, eighth paragraph. Please revise the text to reflect a modified clean closure path and add a discussion here concerning the sulfate plume which originated from the operation of these units.

Response: Accept. The text was revised to reflect modified closure and additional text was added to discuss the sulfate plume. See page 11, left column, last paragraph.

17. Page 11, second paragraph, sixth sentence. Please revise the sentence as follows, "...would be stored on site until treated to meet waste acceptance~~, or a variance or waiver is granted.~~ utilizing an agreed upon path forward

Response: Accept. The sentence was revised. See page 11, right column, last paragraph, first sentence.

18. Page 12, last paragraph. Please revise the text to reflect a modified clean closure approach.

Response: Accept. The text was revised to reflect modified closure. See page 13, right column, second paragraph.

19. Page 13, first paragraph, fifth sentence. Please revise the sentence to read as follows, "...removal of plutonium-239/240 contaminated soils in the concentrated layer to a depth not expected to exceed 1.5 m ...."

Response: Accept. The sentence was revised. See page 13, right column, last paragraph, sixth sentence.

20. Page 13, second paragraph. Please replace the word veracity with the word accuracy.

Response: Accept. The word was replaced. See page 14, left column, second paragraph, first sentence.

21. Page 13, fourth paragraph, fourth through sixth sentences. Please delete these sentences from the plan.

Response: Accept. The sentences were deleted.

22. Page 14, second paragraph. Please delete the text which specifically references compliance with "location or chemical" ARARs and simply reword the text to state whether or not an ARAR will be complied with.

Response: Accept. The term "chemical -specific" was deleted.

23. Page 15, sixth paragraph. Please verify the accuracy of the Remove/Dispose/Vitrify/Backfill alternative cost. When compared to the Remove/Dispose/Backfill/Cap alternative the difference in cost of a cap versus vitrification appears to be $50M. Additionally, the inclusion of a cost table in the plan would aid the reader in directly comparing one alternative with another.

Response: Accept. The costs were verified and a cost table was added. See page 16, Table 4.

24. Page 18, second point of contact. Mr. Sherwood's phone number is 376-9529.

Response: Accept. The phone number was changed. See page 18, right column.