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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 HANFORD/INL PROJECT OFFICE  
309 Bradley Boulevard, Suite 115  
Richland, Washington 99352

October 7, 2005

Keith Klein, Manager  
U.S. Department of Energy  
Richland Operations Office  
PO Box 550 (A7-50)  
Richland, WA 99352

RECEIVED  
OCT 11 2005

EDMC

Re: Transmittal of EPA Determination of DOE Comment Responses to Focused Feasibility Study for the BC Cribs and Trenches Area Waste Sites, DOE/RL 2004-66, Draft A, and the Proposed Plan for the BC Cribs and Trenches Area Waste Sites, DOE/RL-2004-69, Draft A. 65630

65629

Dear Mr. Klein:

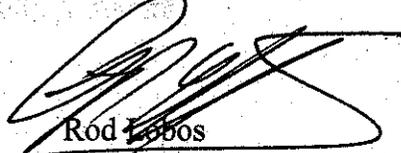
The U.S. Environmental Protection Agency (EPA) is responding to "Comment Responses on the Focused Feasibility Study for the BC Cribs and Trenches Area Waste Site, DOE/RL-2004-66 Draft A, and the Proposed Plan for the BC Cribs and Trenches Waste Sites, DOE/RL-2004-69, Draft A" received on September 13, 2005.

The unresolved issue is the DOE recommendation of the capping remedy. It is EPA's hope that this issue can be resolved in a collaborative manner. EPA is looking forward to working with your staff under an Informal Dispute Resolution period as described in the Hanford Federal Facility Agreement and Consent Order or Tri-Party Agreement (TPA). We expect the Informal Dispute Resolution period to end no more than 30 days from your receipt of this letter.

In our opinion, the six cribs and twenty trenches are better served with near surface excavation and capping, as opposed to just capping. We believe removing the near surface contaminants and capping provides the highest degree of overall protection of human health and the environment, reduces the risk from principal threat waste more effectively, minimizes the reliance on institutional controls to protect against future exposures, and is consistent with stakeholder values as reflected in advice from the Hanford Advisory Board

The responses to the comments are attached for your review. Please contact me at (509) 376-3749 if you have questions.

Sincerely,



Rod Lobos  
Project Manager

Enclosure

cc: C. Cameron, EPA  
D. Faulk, EPA  
B. Foley, DOE  
M. McCormick, DOE  
L. Romine, DOE  
L. Cusack, Ecology  
J. Price, Ecology  
M. Wilson, Ecology  
M. Benecke, FH  
L. Crass, FH  
J. Hertz, FH  
K. Niles, ODOE  
S. Harris, CTUIR  
G. Bohne, NPT  
R. Jim, YN  
T. Martin, HAB  
Admin. Record: 200-LW-1 & 200 TW-1

# REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No: N/A

3. Project No. BC Cribs

4. Page 1 of 17

<p>5. Document Number(s)/Title(s)</p> <p>DOE/RL-2004-66, Draft A, Focused Feasibility Study for the BC Cribs and Trenches Area Waste Sites</p> <p>DOE/RL-2004-69, Draft A, Proposed Plan for the BC Cribs and Trenches Area Waste Sites</p>	<p>6. Program/Project/Building Number</p> <p><input type="checkbox"/> BC Cribs and Trenches Area Waste Sites Remediation Project</p>	<p>7. Reviewer</p> <p>EPA, Letter, R. Lobos to M McCormick, "Transmittal of ...", dated August 4, 2005</p>	<p>8. Organization/Group</p> <p>N/A</p>	<p>9. Location/Phone</p> <p>N/A</p>
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<p>17. Comment Submittal Approval:</p>  <p>_____</p> <p style="text-align: center;">Organization Manager (Optional)</p>	<p>10. Agreement with indicated comment disposition(s)</p>  <p style="text-align: center;">_____</p> <p style="text-align: center;">Reviewer/Point of Contract</p> <p style="text-align: center;">_____</p> <p style="text-align: center;">Date</p> <p style="text-align: center;">_____</p> <p style="text-align: center;">Author/Originator</p>	<p>11. CLOSED</p>  <p style="text-align: center;">_____</p> <p style="text-align: center;">Reviewer/Point of Contact</p> <p style="text-align: center;">_____</p> <p style="text-align: center;">Date</p> <p style="text-align: center;">_____</p> <p style="text-align: center;">Author/Originator</p>
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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	<p><u>Proposed Plan, General Comments</u></p> <p>EPA disagrees with the preferred alternative (Alternative 4) of capping for the 216-B-20 through B-34 and 216-B-52 trenches. In our opinion, Alternative 5 provides the highest degree of overall protection of human health and the environment, reduces the risk from principal threat waste more effectively, and is consistent with stakeholder values as reflected in advice from the Hanford Advisory Board in advice #63, #173 (the Central Plateau Remedial Action Values Flow Chart), and #174. This should be reflected in the document.</p>		<p>Disagreement acknowledged. Additional analysis is being conducted to determine when principal threat waste has decayed sufficiently to reduce acute and chronic exposure to certain intruder scenarios below acceptable guidelines. RL believes that Alternative 4 (capping) may be more protective of human health and the environment, overall, than Alternative 5 (partial excavation and capping) because it avoids the certain worker dose and physical occupational hazards associated with excavation, packaging, transportation, and reburial. 40 CFR 300.430 (9) (iii) (A) states that short-term risk is to be considered in evaluation of overall protection of human health and the environment] at the expense of a potential inadvertent intruder risk. Continued discussion between the EPA and DOE is needed to insure worker risk is properly balanced with the potential environmental benefit of partial removal.</p> <p><i>EPA Response: Not accepted.</i></p> <p><i>DOE states that Alternative 4 (capping) may be more protective, but has not completely conducted analysis to "determine when principal threat waste has decayed sufficiently to reduce acute and chronic exposure to certain intruder scenarios below acceptable guidelines." DOE acknowledged that intruder exposures are not within the CERCLA acceptable risk range after 150 years of IC, but still</i></p>	

# REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 2 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
			<p><i>makes the claim that capping may be more protective. DOE's interpretation of 40 CFR 300.430 (9) (iii) (A) is not consistent with EPA's. This statute does not include any language on potential inadvertent intruder risk. In our opinion, DOE's response does not address stakeholder values as stated in EPA comments. The Board's advice (#173 &amp; #174) clearly articulates the ideal for remedial action is to first characterize, then retrieve, treat, and dispose of wastes. The HAB has also made it clear that barriers should be a last resort remedy. Given these principles, it is apparent that Alternative 4 (capping) is not consistent with stakeholder values and advice. It is also being noted that the DOE responses from a letter dated September 9, 2005, from Mr. Keith Klein to Mr. Todd Martin concerning HAB advice #177, explain that "limited excavation with placement of a surface barrier alternative ... works for small waste sites with shallow contamination (less than 15 feet below ground surface) that have long-lived radioisotopes and /or chemical contamination that pose a risk through direct contact to humans (including intruders) or biological uptake, combined with deeper contamination that is a threat to groundwater." DOE's Proposed Plan shows that waste from BC Cribs &amp; Trenches is less than 15 feet below ground surface. The plan also states: waste poses an unacceptable risk through direct contact, deeper contamination is a threat to groundwater, and inadvertent intruder exposures after 150 years of active institutional controls are not within the CERCLA acceptable risk range of 10<sup>-4</sup> to 10<sup>-6</sup>. In our opinion BC Cribs &amp; Trenches has the attributes Mr. Klein describes in his letter for limited excavation with placement of a surface barrier alternative.</i></p>	
2	The EPA concurs with the preferred alternative (Alternative 3) for 200-E-114 Pipeline.		Accepted.	
3	The EPA disagrees with the preferred alternative (Alternative 4) capping for 216-B-14 through 216-B-19 Cribs. EPA believes that Alternative 5 is a more appropriate alternative. The streamlined characterization approach used for the six cribs creates uncertainty in the extensive assumptions that have to be accepted. Although the representative site chosen is a crib, there are many differences between it and the subject cribs which warrant characterization. The B-46 Crib is located north of the BY Tank Farm and is part of the BY Cribs, while the subject cribs are located south of the BY Tank Farm and are part of the BC Cribs and		<p>See response to #1, above.</p> <p>RL believes that characterization of the 216-B-46 Crib provided adequate data to apply to the 216-B-14 Series Cribs, in accordance with the 200-TW-1 and TW-2 approved Work Plan. Section 2.6.2.3 of the FFS provides a comprehensive discussion of why this crib is representative of the 216-B-14 Series Cribs. While the locations differ, they are both in the</p>	

# REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 3 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
	<p>Trenches Area. Although the representative crib received the same waste stream for part of the time, it was not hooked up to the same pipeline and tank as the six subject cribs. It is also noted that the 216-B-46 Crib originally received wastes from 221-B (page 2-61), while the other cribs did not. Other notable differences between the B-46 Crib and the subject cribs are: contamination in the B-46 Crib starts below 15 feet of depth, while the contamination in the subject cribs are 10-13 feet deep; and the B-46 Crib has impacted groundwater and the six subject cribs have not. The selection of Alternative 5 would ease most of these concerns as contaminants can be monitored as the waste is removed, along with removing most of the higher concentrations of contaminants.</p>		<p>200E Area, which have similar geologic features.</p> <p>Process flow diagrams for the 216-B-46 Crib and 216-B-14 Series Cribs are identical. Both show waste originating from the decladding and plutonium extraction processes associated with the bismuth phosphate/lanthanum fluoride processes in the 221-B/221-T facilities with discharge to B Plant Aggregate Area single shell tanks. Next, supernatant from these tanks was transferred to U-Plant for uranium recovery and subsequent scavenging to remove fission products. The reference to the 221-B plant for only the 216-B-46 Crib waste is an error that will be corrected in the table. That the 216-B-46 Crib is deeper is of minor significance, because its conditions can be readily translated. It is recognized that the groundwater beneath 216-B-46 is contaminated, whereas it is not beneath the 216-B-14 Series Cribs. This distinction is believed to result from the greater relative quantity of liquid discharged to the 216-B-46 Crib and nearby cribs, and because the groundwater is approximately 100 ft nearer the surface. No change to the text is necessary, except to correct the error in Table 2-2 of the FFS and add the depth to groundwater at the 216-B-46 Crib.</p> <p><i>EPA Response: Not accepted.</i></p> <p><i>See response to #1 above.</i></p> <p><i>RL states that both B-46 and the BC Cribs are in the 200 East Area. Maps show BC Cribs and Trenches located south of the 200 East Area. The top of the groundwater under the BC Cribs area is in the Ringold Formation, while the top of groundwater in the 200 East area is in the Hanford Formation. While both of these formations are made up of gravels, soil, cobbles, layers of fines, etc., they have unique properties that present challenges in translating conditions from one waste site to another. EPA believes Alternative 5 provides the highest degree of overall protection of human health and the environment, reduces the risk from principal threat waste more effectively, and is consistent with stakeholder values.</i></p>	
4	<p>The EPA agrees with the preferred alternative (Alternative 3) for 200-E-14 Siphon Tank. However, please note, in FFS comments we state Alternative 5 is more applicable, as the cap for the adjacent sites will more than likely cover this area.</p>		<p>Recommendation to recommend Alternative 5 is accepted, because the cap for the nearby cribs is expected to cover the footprint of the siphon tank. Text will be updated.</p>	

# REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 4 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
5	<p>The EPA agrees with the preferred alternative (Alternative 3) for 216-B-58 Trench, 216-B-53A Trench, 216-B-53B Trench, and 216-B-54 Trench. However, please note, in FFS comments we state Alternative 5 is more applicable, as the cap for the adjacent sites will more than likely cover this area.</p>		<p>Because the cap associated with nearby trenches will cover these trenches, Alternative 4, Capping, is recommended rather than Alternative 3, Remove, Treat and Dispose (Note: this is a change from Draft A). The protection offered by the cap eliminates the need for any excavation of near-surface contamination, similar to the remedy for the other trenches and cribs. Any excavation performed prior to capping would be inconsistent with the criteria applied to the other waste sites, i.e., Alternative 5, Partial Excavation with Capping, is suited for those waste sites having a combination of deep mobile contamination and near-surface contamination with high potential for remobilization. The low levels of contamination associated with these sites would certainly decay to acceptable levels in a reasonable time period (~325 yr).</p> <p><i>EPA Response: Not accepted.</i></p> <p><i>See response to #1 above.</i></p> <p><i>EPA supports the original DOE Alternative 3 that was presented in Draft A and agrees with DOE's original conclusion that "RTD best satisfies this criterion, because it would completely remove all contamination that exceeds risk-based standards and transfer it to the ERDF." EPA did note that Alternative 5 is more applicable, as the cap for the adjacent sites will more than likely cover this area. EPA has concerns in that DOE had agreement with EPA on 3 of the 5 preferred alternatives in draft A. In draft B there is only agreement on 2 of the 5. We hope this is not a continuing trend. The documentation to support this change has not been presented. The costs in the FFS show capping at more than 5 times the cost of RTD. The depth to contamination is only 7 feet below ground. The added cost of a thicker cap will add to the costs. This additional thickness may also cause the caps for the other waste sites to increase in cost. IC's, O&amp;M costs and cap performance for (~325) years and longer lived wastes such as Pu are not explained.</i></p>	
6	<p>Implementability for Alternative 5 is shown as "Moderate: partially meets criterion" for 216-B-20 through B-34 and 216-B-52 trenches and for 216-B-14 through 216-B-19 Cribs, but there is no explanation as to why it is not readily implementable. Please explain.</p>		<p>Alternative 5 is certainly implementable, but it is more difficult than capping. The text already states that the excavation portion of Alternative 5 is considered hazardous to implement relative to Alternative 4 being easily implemented. No change to the text is deemed necessary.</p>	

# REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 5 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
			<p><b>EPA Response: Not accepted.</b></p> <p><i>DOE concedes that Alternative 5 is certainly implementable, but describes it as more difficult than Alternative 4 capping. Please explain why the work associated with Alternative 5 is more difficult and considered hazardous. 40 CFR 300.430 (F) Implementability, is assessed by consideration of "(1) Technical feasibility, (2) Administrative feasibility, and the (3) Availability of services and materials." EPA believes Alternative 4 with its multi-layer cap and intrusion deterrent features adds to the "difficulty" of its implementability. "Difficulties" with Alternative 4 capping are also evident in how differential settlement of the cap is going to be addressed when the crib structure deteriorates over time. Alternative 5 addresses the crib structure deterioration and future soil settlement by removing the structure. It is also being noted that there is remedial worker risk associated with Alternative 4, in the construction of a cap with intruder deterrent features over a Crib that could subside. The costs, risks, and uncertainties associated with settlement of the cribs are absent in DOE's selected remedy. Alternative 4 assumes all barrier sites are considered to have settled and are compacted enough to support construction of a barrier without further settling.</i></p>	
7	<p>For Alternative 4, inadvertent intruder exposures after 150 years of active institutional controls are not within the CERCLA acceptable risk range of <math>10^{-4}</math> to <math>10^{-6}</math>. Please compare this risk to the other alternatives that have contaminants removed.</p>		<p>Accepted. The lesser intruder risk associated with Alternative 5 will be explicitly described.</p>	
8	<p>It appears that remedial worker dose is used as a primary deciding factor in "Short Term Effectiveness," "Implementability," and "Overall Protection of Human Health and the Environment." Please explain.</p>		<p>Potential impacts on workers during remedial action, i.e., remedial worker dose and exposure to physical occupational hazards, is a primary element of short term effectiveness. Per 40 CFR 300.430, overall protection of human health and the environment "draws on the assessments of other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs. Implementability considers the "ease of implementing the alternatives". While implementable, Alternative 5 is certainly more difficult than Alternative 4. No change to the text is necessary.</p> <p><b>EPA Response: Not accepted. See response to Comment #6, Proposed Plan, General Comments.</b></p>	

# REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 6 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
			<p><i>Potential remedial worker dose being used as a primary deciding factor in "Implementability" and "Overall Protection of Human Health and the Environment" is not explained.</i></p> <p><i>Potential impacts to workers during remedial actions, such as remedial worker risk associated with Alternative 4 in the construction of a cap with intruder deterrent features over a Crib waste site that could subside, could be more of an industrial risk than excavation. Alternative 5, with the crib structures being excavated, removes the structure that could subside. Although the cribs could be grouted, it would be an additional expense and one would not have certainty that all voids that could affect workers and the cap would be filled. The "protected worker" analysis included basic radiological controls and ERDF criteria. It lacks a table (similar to Table F1-18) that would permit ready evaluation of which operations contribute most significantly to collective dose and would be most likely to benefit from additional radiological controls. Although Table F1-18 applies to the "unprotected worker" case, it does demonstrate that the majority of the collective dose is associated with two tasks: bulldozer operation and cover installation. No specific radiological controls are identified that reduce collective doses for these two tasks. "Unprotected worker" analysis does not include surveys by radiological controls personnel and includes container dose rates that exceed the ERDF acceptance criteria. The collective doses are all modeled. Modeling results should be compared with actual doses received by bulldozer operators at ERDF relative to actual Cs-137 concentrations and with remedial workers who are installing covers.</i></p>	
9	<p>The EPA recognizes that it is difficult to implement complete RTD on some of these sites due to the depth of excavation required, but it should be acknowledged that technologies may need to be investigated to properly address the deep technetium-99 and nitrate contamination. Additional characterization is warranted to reduce the uncertainty in the amount of contamination remaining in the deep vadose zone. The FS and proposed plan should describe an updated strategy for how to address this.</p>		<p>Development of technology to immobilize the Tc-99 and nitrate contamination is discussed in both the PP (included in recommendations) and FFS (Section 8.1.4). The explicit recommendation to evaluate soil desiccation will be updated to include the recommendations of the expert panel that met in April 2005.</p> <p>Accepted. Description of soil sampling to ground-truth the high resolution resistivity (HRR) data obtained in 2004 and 2005 will be expanded. This confirmatory sampling will</p>	

## REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 7 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
			provide a correlation between the HRR data and Tc-99/nitrate concentrations.	
10	There should be some discussion on the portion of pipeline that is north of Route 4 South. A strategy should be formulated for addressing it. No rationale is provided in regards to why the entire pipeline is not addressed in this proposal.		Accepted. Strategy for the remainder of the pipeline will be expanded to state that it will be addressed in the revised 200-TW-1 FS. It is possible that rebinning of waste sites could place that portion of the pipeline in the 200-IS-1 OU.	
1	<u>Proposed Plan, Specific Comments</u> <i>Page 1, second paragraph.</i> Add siphon to tank. It should be consistent with the rest of the document.		Accepted.	
2	<i>Page 1, bulleted paragraph last sentence.</i> Add monitoring.		Accepted.	
3	<i>Page 1, highlighted box, third bullet.</i> Send comments to Rod Lobos (509) 376-3749, lobos.rod@epa.gov		Accepted.	
4	<i>Page 2, second bullet, second sentence.</i> Remove description of the evaluation process and add what the groundwater needs to be protected from, i.e. technetium-99 & Nitrate contamination in the vadose zone.		Accepted.	
5	<i>Page 2, "Overview of the Proposed Plan" at the end of the first sentence.</i> Make a note to see Figure 2.		Accepted.	
6	<i>Page 5, first sentence.</i> The sentence states that there are 16 trenches, but earlier it was listed as 20.		Accepted. Wording has been revised to "The BC Cribs and Trenches Area waste sites include 6 cribs and 16 trenches that received scavenged waste from the uranium recovery process .... Four additional trenches, formerly in the 200-LW-1 ..."	
7	<i>Page 5.</i> The actual contaminated area (acres or another unit of measurement) should be quantified and compared to the non-contaminated area for the BC cribs and trenches.		Accepted. Statement will be added that approximately 10 acres of the overall 36.6 acre area is comprised of individual waste sites.	
8	<i>Page 5, "Scope and Role of Action" second to last sentence.</i> Change "in the next 3 to 10 yr." to "sometime in the future."		Accepted.	
9	<i>Page 6,</i> What do the colors in Figure 2 represent? There should be a legend explaining these.		Accepted. Figure 2 has been revised; the colors have been eliminated.	
10	<i>Page 6,</i> Pipeline, Siphon Tank, Cribs, and Trenches should be labeled for easy identification.		Accepted.	
11	<i>Page 9, Stand-alone sites rationale.</i> For Siphon Tank and pipeline it is stated that contaminant distribution would be higher in the soil column. Since there is no history of leaks, it should be expected for the soil column to have significantly lower levels of contaminants. Explain why this statement is made.		Statement has been revised to reflect that any contamination resulting from leaks, which have not been known to have occurred, would be much shallower (vs. "higher") in the soil column.	

## REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 8 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
12	<i>Page 10</i> , Estimate total amount of contaminants that will be removed under the different alternatives.		Accepted with modification; this information would fit better within the discussion of remedial alternatives beginning on page 15. Instead of quantities of contaminants removed, estimates of the fractions of contamination removed during each alternative will be stated.	
13	<i>Page 11, fourth bullet</i> . Describe and quantify "shallow zone." (i.e. 0 to 15 ft bgs.)		Accepted.	
14	<i>Page 11 &amp; 12, Land Use</i> . Change "industrial/exclusive zone" to "industrial zone" in this document or provide a reference and definition for "industrial / exclusive."		The land use description has been modified to depict an industrial-exclusive zone as defined by DOE/EIS-0222-F, <i>Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement</i> , and the ROD (64 FR 61615, "Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement [HCP EIS]"). The zone depicted in the CLUP is located in the middle of the Central Plateau.  <i>EPA Response: Accepted.</i>	
15	<i>Page 11, Land Use</i> . Remove web link.		Accepted; link has been removed.	
16	<i>Page 12, Human Health Risk, first paragraph, last sentence</i> . Clarify exposure time of "a few hundred years."		Accepted; sentence has been revised to state "a few hundred hours"	
17	<i>Page 12, Human Health Risk, second paragraph, first sentence</i> . Add "if no action is taken" to the end of the sentence. It should also be noted that the groundwater in the BC area has not been impacted by Hanford activities.		Accepted.	
18	<i>Page 12, Human Health Risk, fourth paragraph, fourth sentence</i> . Change "humans are not protected" to "humans who come in contact with the waste are not protected."		Accepted.	
19	<i>Page 12, Human Health Risk</i> . Add a paragraph describing each scenario.		Accepted.	
20	<i>Page 13, Ecological Risk</i> . Add a paragraph explaining that biota are present in the BC Control Area.		Accepted.	
21	<i>Page 13, Second RAO</i> . Drop the word "further" from the RAO. At this point the GW under the BC Cribs is not impacted.		Accepted.	
22	<i>Page 14, Summary of Site Risks, First bullet</i> . 15 mrem/yr is consistent with the CERCLA acceptable risk range of $10^{-4}$ to $10^{-6}$		Accepted.	
23	<i>Page 15, Summary of Remedial Alternatives, First paragraph, third sentence</i> . Change "the Regulatory Agencies (Washington State Department of Ecology [Ecology] and EPA) have a" to read "of the."		Accepted.	

## REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 9 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
24	Page 18, last sentence. Add "as no cap would be needed." At the end.		Accepted.	
25	Page 19, Compliance with ARARs, end of first paragraph. Add "adjacent to waste site."		Accepted.	
26	Page 21, End of first paragraph. Clarify the high rating for Alternative 3 and moderate for Alternative 5.		Accepted. This sentence is intended to state that Alternatives 3 and 5 have high and moderate short-term environmental impacts, respectively, due to the quantities of borrow material required and areas affected.	
27	Page 22, Cost, Third to last sentence. Change "to satisfy waste acceptance criteria" to "worker protection."		Accepted.	
28	Page 23, Second bullet. Update this area with the results from the focused feasibility study process and evaluation of the selection of soil desiccation as the preferred technology.		Accepted.	
29	Page 24, End of third paragraph. Change "EPA 15 mrem / yr standard" to "15 mrem /yr operational limit."		Accepted.	
30	Page 36, Public Meetings. Change "Dennis Faulk at (509) 376-8631" to "Rod Lobos at (509) 376-3749."		Accepted.	
31	Page 36, Submitting Comments. Change "712 Swift Boulevard, Suite 5" to "309 Bradley Blvd, Suite 115."		Accepted.	
32	Page 36, Submitting Comments. Change "faulk.dennis@epa.gov" to lobos.rod@epa.gov.		Accepted.	
33	Page 36, Points of Contact. Change "Dennis Faulk" "(509) 376-8631" to "Rod Lobos" "(509) 376-3749."		Accepted.	
1	<u>Focused Feasibility Study, General Comments</u> EPA disagrees with the preferred alternative of capping for the 216-B-20 through B-34 and 216-B-52 trenches. In our opinion, Alternative 5 provides the highest degree of overall protection of human health and the environment, reduces the risk from principal threat waste more effectively, and is consistent with stakeholder values as reflected in advice from the Hanford Advisory Board in advice # 63, #173 (the Central Plateau Remedial Action Values Flow Chart), and #174.		See response to Comment #1, Proposed Plan, General Comments.  <i>EPA Response: Not accepted. See response to Comment #1, Proposed Plan, General Comments.</i>	
2	It is assumed that proposed excavated depths are from current ground surface elevations. If this is correct, a large amount of the proposed excavation will be "essentially clean." It is not clear if this was factored into worker dose as it relates		Your assumption is correct. However, the worker dose estimate assumed that the soil was essentially "clean" from the surface to 11 ft bgs. Then the soil was contaminated to	

# REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 10 of 17

# REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 11 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
			<p><i>Assumptions for construction of caps under both alternatives 4 &amp; 5 state the sites will not require preleveling before the start of barrier construction and that all barrier sites are considered to have settled and are compacted enough to support construction of a barrier without further settling. These assumptions are applicable for Alternative 5 in that the waste site will be excavated and then backfilled. The backfill can be leveled and smoothed along with compaction to support the cap without further settling. The assumptions are not as applicable for Alternative 4 in that the waste site could settle and the sites currently are not level or smooth. One would reason that if some portion of the cap were damaged, the costs in repairing the Alternative 4 cap would be more than the costs in repairing the Alternative 5 cap.</i></p> <p><i>It is also being noted that the DOE established subcontractor rate structure associated with disposal at ERDF predisposes DOE's selection remedy to capping.</i></p>	
5	<p>The construction methods for the various alternatives require using water for dust control, which has the potential to adversely impact mobile contaminants that have not reached groundwater. There should be a discussion as to which alternative would minimize the potential impact to groundwater. Naturally, one would assume most of the water used for dust suppression while excavating, would be removed from the waste site when the soil is disposed of in ERDF. Although both Alternatives 4 and 5 have "engineered barriers," one would deduce that the "engineered barrier" with the most layers and the greatest requirement for compaction and accompanying moisture may have a higher potential for mobilizing contaminants.</p>		<p>Most of the water used for dust control during excavation would be carried to the ERDF with the excavated soil. However, there is potential for some of this water to remain following excavation. Also, additional water may be added when borrow soil is added to the excavation prior to constructing the cap, to ensure proper compaction of the soil beneath the cap. Thus, Alternative 5 may introduce more water into the vadose zone. Because the caps used for Alternatives 4 and 5 are expected to be identical except for the intrusion-deterrent layer associated with Alternative 4, each cap would probably contain the same quantity of "extra" water. No change to the text is necessary.</p> <p><i>EPA Response: Not accepted.</i></p> <p><i>Although RL states that essentially the same cap will be constructed, the FFS describes two very different caps. The cap for Alternative 4 has essentially 8 layers, 40" engineered fill, 4" base course, 6" asphalt, 6" drainage gravel, 6" gravel filter, 6" sand filter and geotextile, 20" silt loam, 20" silt loam pea-gravel. While Alternative 5 has 3 layers, 40" engineered fill, 20" silt loam, 20" silt loam pea-gravel.</i></p> <p><i>A water budget for construction activities should be included for the different proposed caps to evaluate which alternative has the higher potential for mobilizing</i></p>	

# REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 12 of 17

# REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 13 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
			<p><i>employed. Additional shielding, use of remotely-operated equipment, and improved vehicle cover methods are some of the ways in which collective doses could be reduced. Estimates of significant collective dose should be followed with additional ALARA analysis to compare costs, anticipated collective dose reductions, and other considerations. Changes to modeled construction methods and radiological controls to minimize or even prevent dose to workers should be explored by DOE as part of an evaluation of alternatives. The collective doses are all modeled. Modeling results should be compared with actual doses received by Hanford remedial workers doing similar work.</i></p>	
7	<p>It is unclear why remedial worker dose is deemed as "considerable worker risk," It is stated in the FFS that, "Radiological controls can readily be applied to the excavation process to limit the expected human dose." (page f-38). The projected collective dose for protected remedial workers is 76 person-rem for (Alternative 3) complete RTD, intuitively (Alternative 5) near-surface excavation would be somewhat less. It is expressed in the FFS that approximately 36% of the remedial worker dose is at ERDF. The secondary waste acceptance criteria for ERDF include radiological control-based criteria (limits on smearable alpha and beta, limits on total dose at 1 ft, etc.). These limits are for worker protection. If a project ships waste that meets these criteria, no unacceptable exposures to ERDF employees should occur. If one is confident in the worker safety controls at ERDF, the 76 person-rem estimate can be reduced to less than 49 person-rem for all the work excluding ERDF. It is understood that partial excavation and capping would take approximately 2.6 years to complete. If one takes into account the length of time it takes to complete the project, it would yield less than 19 person-rem/yr. Evaluating the total expected worker received dose (except ERDF) of 19 person-rem/yr to the DOE whole body dose limit of 5 rem/year for each worker or the DOE Administrative Control Level of 2 rem/year for each worker, the remedial worker expected dose seems minimal. Please explain why the remedial worker risk is described as considerable.</p>		<p>Accepted. The protected remedial worker dose is slightly less for Alternative 5 than for Alternative 3. Appendix F shows that the protected worker dose associated with removal of the "high activity soil layer" is 97.0% of the total dose. Because of the overall uncertainty associated with the calculations, this distinction was considered to be negligible. This information will be added, however.</p> <p>There are appropriate worker safety controls at the ERDF, but the dose incurred there would still be elective and elevated more than routine operations.</p> <p>Alternative 4 durations are about 2/3 of the times required for Alternative 5. Thus, the duration component for the Alternative 5 excavation is estimated at about 1/3 of the overall remediation time. This translates to approximately 10.4 months for the Alternative 5 excavation. Then, the 49 person-rem would be incurred in a single year. This is a considerable dose to manage to ensure that no administrative limits are challenged. See response to #6, above.</p>	
1	<p><u>Focused Feasibility Study, Specific Comments</u>  <i>Page 2-36, Deep Zone Groundwater Protection.</i> It appears the STOMP modeling was performed using a point calculation (i.e. contaminants modeled as they immediately hit groundwater). Traditionally groundwater risks are calculated by extracting groundwater from a screened well adjacent to the waste site. Calculating</p>		<p>Accepted. Additional STOMP modeling that evaluates groundwater extracted from a screened well adjacent the waste sites will be included.</p>	

## REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 14 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
	the groundwater risk pathway by this method more accurately represents the risk to human health from consuming groundwater. Recommend the modeling be expanded to run this additional scenario.			
2	Page 2-38, Section 2.7.3 second paragraph. For comparison purposes EPA suggests listing the intruder dose limits from DOE Order 435.1 of 100 mrem/yr chronic and 500 mrem/yr acute. Suggest this information be carried through the intruder scenario discussion.		Accepted.	
3	Page 2-40, Section 2.7.4.3. It is not clear how analogous B-46 is to B-14 through B-19 Cribs. Please clarify the expected depths to contamination in the B-14 through B-19 Cribs and how this might change the risk profile.		The bottoms of the B-14 Series Cribs are approximately 5 ft shallower than the 216-B-46 Crib. This difference is illuminated in discussion of the applicability of this site to the B-14 Series Cribs in Section 2.6.2.3. For the baseline case, i.e., no remedial action taken, the B-14 Series Cribs present an obvious human health risk, in contrast to the 216-B-46 Crib, because the depth to contamination is estimated at about 12 ft. The differences with the 216-B-46 Crib are explicitly described in Section 2.6.2.3. Section 2.7.4.3 discusses how the risks associated with 216-B-46 are translated to the analogous 216-B-14 Series Cribs. No change to the text is necessary.  <i>EPA Response: Not Accepted. See response to Comment #3, Proposed Plan, General Comments</i>	
4	Pages 2-61 through 2-74, Table 2-2. The table uses two sets of numbers one set is in parenthesis. Please label and explain.		Footnote at the end of the table provides this information: "( ) values in parentheses are from the Soil Inventory Model, 2004." No change to the text is necessary.	
5	Pages 2-69, Table 2-2, 216-B-30, Rationale. The table states "site construction is identical to the 216-B-46 Crib." It should read "site construction is identical to the 216-B-26 Trench."		Accepted.	
6	Page 3-10, Section 3.5.3. Drop the words "to be conservative" not exceeding MCLs is what is required by regulation.		Accepted with modification: As stated, the sentence describes the conservatism regarding the point of compliance. Because calculations are being revised to reflect an updated point of compliance focused on a screened well adjacent the waste sites, this sentence will change accordingly: "PRGs were calculated on the basis that extracted groundwater would not exceed MCLs."  <i>EPA Response: Accepted.</i>	
7	Page 3-14, Table 3-2. Please clarify the purpose of footnotes g, h & j.		These footnotes relate the PRGs to specific sampled sites. Indication of Pu-239/240 as being related to 216-B-46 is an error - it should be shown as applying to all of the sites, including the 216-B-53A Trench, which used to be considered	

# REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 15 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
			a TRU waste site. Further consideration of having different PRGs for different groupings of waste sites leads to the conclusion that the 216-B-46 Crib and 216-B-26 Trench should be grouped, because they received the same waste stream, and the 216-B-58 grouping should be separate, because it represents an entirely different waste stream. The text will be changed to reflect the above statement.	
8	<i>Page 4-12, Section 4.2.2.5</i> EPA disagrees with adding this tank to the Z-361 action. Please remove this statement.		Accepted although RL maintains that remediating this tank with similar tanks is cost efficient. Statement that the Z-361 EE/CA will be amended will be deleted.	
9	<i>Page 6-28, 216-B-58 Trench.</i> It is not clear why this alternative is not applicable. It seems likely that due to the geographic proximity to the other sites one cap would be installed over the entire area; thus these sites by default would fall under Alternative 5.		RL disagrees that this site and analogous sites should default to Alternative 5, because none of these sites possess the contaminant distribution model that makes this alternative appropriate. See response to Comment #5, Proposed Plan, General Comments.  <i>EPA Response: Not accepted. See response to Comment #5, Proposed Plan, General Comments.</i>	
10	<i>Page 7-1, Section 7.1.1, 1<sup>st</sup> paragraph.</i> It is not clear why Alternative 4 capping is the most protective (of human health and the environment). Intuitively Alternative 3 or 5 should be more protective as contaminants are removed from the waste sites. Please clarify.		The primary argument is that Alternative 4 effectively balances the human health risk associated with the potential inadvertent intruder into the contamination against the certain risk to remediation workers represented by excavating the contamination. Capping recognizes that this intruder risk would disappear in the time frame that institutional controls would be in place to ensure continued groundwater protection. Also, Alternative 4 is more protective of the environment, because it causes the least disruption of the landscape by requiring the least borrow soil. No change to the text is necessary.  <i>EPA Response: Not accepted. See response to Focused Feasibility Study, General Comments #6.</i>  <i>DOE responses from a letter dated September 9, 2005 from Mr. Keith Klein to Mr. Todd Martin concerning HAB advice # 177, explained that "limited excavation with placement of a surface barrier alternative... works for small waste sites with shallow contamination (less than 15 feet below ground surface) that have long-lived radioisotopes and /or chemical contamination that pose a risk through direct contact to humans (including intruders) or biological uptake,</i>	

## REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 16 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
			<i>combined with deeper contamination that is a threat to groundwater." DOE's Proposed Plan shows that waste from BC Cribs &amp; Trenches is less than 15 feet below ground surface. The plan also states: waste poses an unacceptable risk through direct contact, deeper contamination is a threat to groundwater, and inadvertent intruder exposures after 150 years of active institutional controls are not within the CERCLA acceptable risk range of 10<sup>-2</sup> to 10<sup>-6</sup>. In our opinion BC Cribs &amp; Trenches has the attributes Mr. Klein describes in his letter for limited excavation with placement of a surface barrier alternative.</i>	
11	<i>Page 8-1, Section 8.1.1. EPA disagrees with the preferred alternative of capping for the 216-B-20 through B-34 and 216-B-52 trenches. In our opinion, Alternative 5 provides the highest degree of overall protection of human health and the environment reduces the risk from principal threat waste more effectively, and is consistent with stakeholder values as reflected in advice from the Hanford Advisory Board in advice # 63 (institutional controls on the Hanford site), #173 (the Central Plateau Remedial Action Values Flow Chart), and #174.</i>		See response to Comment #1, Proposed Plan, General Comments.  <i>EPA Response: Not accepted, see EPA comment #1, Proposed Plan, General Comments.</i>	
12	<i>Page 8.2, Section 8.1.2 As discussed earlier for 216-B-58 and its associated sites, Alternative 5 seems more appropriate than Alternative 3 as the cap would cover the area.</i>		See response to Comment #5, Proposed Plan; General Comments.  <i>EPA Response: Not accepted, see EPA comment #5, Proposed Plan, General Comments.</i>	
13	<i>Page 8-2, Section 8.1.3 As outlined in comment 10. EPA believes Alternative 5 is more appropriate for waste sites 216-B-14 through 216-B-19.</i>		See response to Comment #1, Proposed Plan, General Comments.  <i>EPA Response: Not accepted, see EPA comment #1, Proposed Plan, General Comments.</i>	
14	<i>Page 8-3, Section 8.1.4, Second paragraph. This paragraph should be updated to reflect findings from the independent technical review since it has already been conducted.</i>		Accepted.	
15	<i>Page B-11, MTCA. The rational column for MTCA should be changed from relevant &amp; appropriate to applicable since these regulations are used to establish PRGs. In all other decisions, 173-340 had been applicable, not relevant &amp; appropriate. Same comment applies to WAC 173-350.</i>		RL continues to take the position that the language of CERCLA Section 120 does not waive sovereign immunity from enforcement of state cleanup laws. RL believes that Section 120 requires federal agencies to comply with substantive provisions of state cleanup laws to the extent such provisions are determined to be ARAR to the contemplated action(s). There are still unresolved issues regarding the extent the federal government has waived its sovereign immunity	

## REVIEW COMMENT RECORD (RCR)

1. Date 8/31/05

2. Review No. N/A

3. Project No. BC Cribs

4. Page 17 of 17

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
			<p>under Section 120. Therefore, although we agree to address substantive provisions for MTCA in this remedial action, it is the RL position that such provisions are only considered relevant and appropriate in the context of CERCLA requirements.</p> <p style="text-align: center;"><i>EPA Response: Accepted.</i></p>	
16	Page D-1, D2.0, update highlighted area.		Accepted.	
17	Page F-1, Section F1.2 Change the word "meager" to "limited."		Accepted.	
18	Input parameters for groundwater modeling needs to be included in the appendix.		Accepted.	