UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 HANFORD PROJECT OFFICE
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0064025

March 10, 2005

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Mr. Bryan Foley
U.S. Department of Energy
PO Box 550, A6-38
Richland, WA 99352

Subject: Transmittal of Comments on the 200-CW-5 Operable Unit Group Feasibility Study and Proposed Plan

Dear Mr. Foley:

The U.S. Environmental Protection Agency (EPA) has reviewed the 200-CW-5/4/2/SC-1 (Cooling Water and Steam Condensate) operable unit group feasibility study (DOE/RL-2004-24, Draft A) and proposed plan (DOE/RL-2004-26, Draft A). Our comments (including those provided by our U.S. Geological Survey support) are enclosed. In addition, supporting comments from the Washington Department of Ecology (Ecology) are also enclosed. 63155 63154

Comments consisting of minor questions and addressing typographical or formatting issues were passed along informally today to Michael Hickey of Fluor Hanford, Inc (FH). Many of the comments were provided informally prior to this formal transmittal of all written comments. Please contact me at (509) 376-8665 if you have questions.

Sincerely,

Craig Cameron

Craig Cameron
Remedial Project Manager

Enclosures:

1) EPA comments on proposed plan
2) EPA general comments on feasibility study
3) EPA specific comments on feasibility study
4) USGS comments on feasibility study and proposed plan
5) Ecology comments on feasibility study and proposed plan

cc: John Price, Ecology
Michael Lackey, FH
Administrative Record:
200-CW-5 (Cooling Water and Steam Condensate) Operable Unit Group (includes 200-CW-5, 200-CW-2, 200-CW-4, and 200-SC-1)

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EPA Comments on the Proposed Plan for the 200-CW-5, 200-CW-2, 200-CW-4 and 200-SC-1 Operable Units (DOE/RL-2004-26 Draft A)

February 28, 2005

General

1. The U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) needs to plan for the participation of the National Remedy Review Board as the potential remedies selected add up to more than $75 million for these soil waste sites.

2. There appears to have been some confusion on the part of the authors of this proposed plan. The lead regulatory agency for all of the units and waste sites is the EPA, not the Washington Department of Ecology (Ecology). Please revise the document wherever necessary to reflect this.

3. The proposed plan appears to be biased towards capping and to place too much weight on the balancing factor of cost. Please see the specific comments section and EPA's comments on the feasibility study (FS) that identified examples of this bias. Reviewers from Ecology and the U.S. Geological Survey (USGS) made similar comments.

4. The use of "bounding" representative waste sites for analogous site grouping of disparate types of waste sites (albeit coming from the same waste stream sources) is an approach that oversimplifies characterization efforts and can only be compensated for by more detailed analysis of individual analogous sites followed by confirmatory sampling. Fortunately in this proposed plan, most of the waste sites that vary significantly in type from their representative site are planned to undergo Removal, Treatment, and Disposal (RTD). The RTD will follow the observational approach and the cleanup will be verified. However, as was noted in USGS comments, some of the ditches (shallow-contaminated sites) have the same capping remedy preferred as is mentioned for their representative site, the 216-U-10 Pond. Please provide clarification as to the reason for preferring the same alternative for each type here.

5. EPA legal review of the 200-UW-1 proposed plan has led to some items that need to be addressed in this proposed plan. First, the 200-CW-5 proposed plan is very long and still has a fair amount of Hanford jargon and therefore will be difficult for members of the public to read. This appears to be true even with helpful definitions in the side column instead of in a glossary. EPA would like to help determine ways to trim it down. We believe that the proposed plan would really benefit from inserting the fact sheet up front to serve as a kind of executive summary. It should be no longer than three pages. This will hopefully make reading the rest of the document easier. We may even have to resort to having a table of contents and possibly section numbers because it is so long.

   Finally, the ecological risk discussion will appear to be inadequate without reference to the greater central plateau ecological risk assessment and how information from it will be

factored in, even if it will not be until after the Record of Decision (ROD). Please describe this greater risk assessment in both the FS and proposed plan. The FS currently mentions only the Central Plateau Ecological Evaluation, which is not a full, baseline ecological risk assessment.

6. The findings of the report on additional modeling (exposure scenarios) performed need to be incorporated into this proposed plan and both the proposed plan and FS need to refer to the additional modeling; its purpose, methods, and findings and how they relate to the work already covered in the FS. The report should either be rolled into the FS when it is revised to address comments or, at the very least, it needs to be placed in the administrative record file for these operable units.

7. The EPA is struggling with the concept of relying on the plug-in approach when this should be a final ROD. For one thing, the complexity of many 200 Area sites would likely require a ROD amendment to add them into an ongoing remedial action. Newly discovered waste sites (found under facility slabs, for example) could be plugged in on a limited basis, but significant sites or numbers should be added in through a ROD amendment.

   The plug-in approach should be used when confirmatory sampling performed on a waste site already within this remedial action shows that the selected alternative is not appropriate. If another remedy analyzed under the FS will work, it can be applied with only the use of an Explanation of Significant Difference. If a totally different remedy (not analyzed under the FS) is the answer, then a ROD amendment would have to be written.

   We believe that patience is required to navigate through these first few decisions. These first few projects are difficult because many policy level decisions need to be made to reach agreement and develop RODs. Once these larger issues are resolved and embodied in RODs, the other decisions on the Central Plateau will go a lot more smoothly. This is the lesson from the 100 Area effort. The amount of characterization and the adequacy of FSs must not be reduced based on the plug-in approach as characterization is already very streamlined. The two late substitutions of representative sites from other operable units sufficed for this FS, but the excuse that time ran out on the schedule (as explained in the FS) and that is why they were needed is not a justification for this substitution.

   As large as the currently planned operable unit groups are in scope the Tri-Parties should hold fast to the number of proposed plans and decision documents as enough streamlining has been achieved. This is not to say that lessons learned about waste sites should be ignored when coming to decisions elsewhere in the 200 Areas. The lessons learned will no doubt fulfill the purpose of the plug-in approach while still maintaining the appropriate level of detail and analysis for these large groups of waste sites.

8. The EPA agrees with the preferred alternative (Alternative 4) suggested for 216-T-36 Crib (and by default, for the representative site 216-T-26 Crib from 200-TW-1). However, results of a planned treatability study for Tc-99 for the 200 Areas are necessary

to ensure deep Tc-99 is addressed adequately by the remedy once selected. It should be acknowledged that capping will not likely prevent very deep contamination from reaching the groundwater and the FS and proposed plan should describe a strategy for how to address this. We also agree that Alternative 3 should be the preferred alternative for the 200-W-79 Pipeline.

9. The EPA agrees with the preferred alternative (Alternative 3) for 216-U-14 Ditch and analogous sites.

10. The EPA concurs with the preferred alternative (Alternative 3) for the 207 A Retention Basin.

11. The EPA disagrees with the preferred alternative listed (Alternative 4) for the 216-U-10 Pond and its analogous sites. EPA believes that Alternative 5 (Partial RTD and capping) is the best choice to meet shallow cleanup requirements driven by MTCA and CERCLA's preference for RTD. This would provide protection of groundwater, hopefully, with a cap that is not required to perform to as high a level. Removal of shallow contamination to ERDF will provide better protection against intruder exposures. EPA does agree that Alternative 3 should be selected for shallow sites with no groundwater protection issues, and that Alternative 1 (No Action) should be chosen for the 216-B-64 Retention Basin; which was not used. The latter may have already been reclassified under the M-14 process.

12. The EPA disagrees with the preferred alternative given (Alternative 4) for 216-Z-11 Ditch and its analogous sites. EPA believes that removal of this shallow contamination to WIPP and ERDF is the most protective alternative for this long-lived problem. Some of the Z-Ditches will not attain PRGs for over 10,000 years and just capping this material that is so near to the surface will not ensure protection against intrusion over this long time frame. Safe removal of waste sites with high transuranic content is occurring at the Idaho National Environmental Engineering Laboratory in Idaho, so safe practices have been developed and proven. Capping with a nearly mile-long Hanford Barrier is not an effective use of cleanup money compared with the more certain hazard reduction of removing contaminants to ERDF and TRU-level contamination (some of it 130 times the TRU level of 100 nCi/g) to a geologic repository (WIPP).

<u>Specific</u>

1. *Page 1, Introduction.* The ordering of the discussion should follow starting from Alternative 1 towards 6. Where is the discussion in the text about the ROD and whether or not it is a final ROD? The "How You Can Participate" box is a little too vague and scant on this subject to suffice.

2. *Page 1, Introduction, first paragraph, second sentence.* Add "eliminate or" before "reduce."

3. *Page 1, Introduction, fourth paragraph.* Please remove references to Ecology; they are not a lead or joint-lead regulatory agency for these operable units. Also, please remove references to Treatment, Storage and Disposal (TSD) units, as there are no TSDs associated with the waste sites in this operable unit.

4. *Page 2.* There is not enough room for the column in the margin, unless maybe the document is double-sided.

5. *Page 2, first full paragraph.* It is not clear why there is a need to discuss RCRA/CERCLA integration if there are no TSDs associated with these waste sites. Please explain.

6. *Page 2, Overview of Proposed Plan, fourth paragraph, two sentences before bullets, sentence beginning "Appendix A..."* Why are the present-value costs the only ones included? Show both kinds of costs as some of these alternatives would be implemented over different time frames. This is especially important to reflect impact of the costs of groundwater monitoring over long durations.

7. *Page 2, Overview of Proposed Plan, last set of bullets.* Please include "State acceptance" since Ecology is not a lead or joint-lead regulator on this project.

8. *Page 3, side column, entry entitled, "How do we know what contaminants are present at the waste site?* Delete this. This is a waste. One cannot sum this up in a column entry. It would be better to mention that supporting information is provided in the FS and give the title and DOE document number. It would be best not to mention the other two FSs, except later in the text where there is enough opportunity to discuss them.

9. *Page 4, 200 Areas.* Please indicate that while the volumes were unknown for waste sites within some of these units, that confirmatory sampling will be performed to make sure they fit within the conceptual model assigned to them.

10. *Page 4, Scope and Role of Action, last sentence.* There is no substance to this sentence. Please elaborate.

11. *Page 5, side column, entry for "Analogous Site Approach."* Please delete, this is too much to explain in a side column entry.

12. *Page 9, Land Use.* The use of 500 years instead of 150 years (100 years after active waste management) has no connection with the reality of discussions at the exposure scenarios task force workshop that was the impetus for Hanford Advisory Board advice and the Tri-Party response. Please eliminate everywhere in the document this misuse of the anticipated period where it is believed active institutional controls may not be able to be relied upon to keep intruders out of central plateau core zone waste sites. In this section, it also appears on the Native American uses bullet and on the bullet about no consumptive use of groundwater. This last bullet needs to be revised based on clarifications being made to the Tri-Party response that are compliant with CERCLA

groundwater restoration requirements. These changes must be made in the FS, too.

13. *Pages 9 and 10, Remedial Action Objectives, bullets.* Please only state the RAOs as they are without additional explanation. Please explain how these are met in the other sections.

14. *Page 10, Preliminary Remediation Goals, third sentence after bullets.* Replace "a given" with "the above" and replace "criterion" with "criteria."

15. *Page 10, Summary of Remediation Objectives.* The title of this section is confusing. Does DOE intend to discuss further how it is going to demonstrate attainment of the RAOs? Please clarify.

16. *Page 10, Summary of Remediation Objectives.* EPA understands that DOE management has a preference for final RODs. Why then is the Hanford Past-Practice Strategy mentioned as the guide to how ecological risk evaluations were performed? The use of this approach is inadequate for baseline risk assessments necessary for final decisions. DOE will need to update (and possibly address findings) this OU-specific ecological risk assessment when the results of the wider central plateau baseline terrestrial ecological risk assessment is completed. Only then will ecological risk be fully addressed. The wider risk assessment must be completed and information analyzed before remedies are implemented.

17. *Page 11, Table 2.* The PRGs for the mobile contaminants need to be listed, even though site-specific modeling has been conducted. This modeling can be explained. The EPA believes that the conceptual models and characterization data indicate that some of these contaminants that are far down in the vadose zone will reach groundwater no matter what is done at the surface. This is similar to the situation with some of the cribs in the 200-UW-1 project. We believe that the document and FS should acknowledge the likelihood of this possibility and discuss a plan to deal with it. The 200 Area wide treatability study effort for Tc-99 and other mobile constituents may provide answers to how to approach this contamination at depth. Any plan would include coordination with the groundwater operable units.

18. *Page 11, Table 2.* The PRG for Sr-90 in the 216-T-26 section seems too high, is this an error? Please explain.

19. *Page 12, side column entry for Human Health Risk.* Replace "land-use" with "exposure."

20. *Page 12, Summary of Site Risks, last bullet.* Insert "representative" between "two" and "sites."

21. *Page 12, side column entry for Inadvertent Intruder Scenario.* This is just one example of where the institutional control date mentioned is 500 years but must be 150.

22. *Page 13, Summary of Remedial Alternatives, bullet on Alternative 4.* It is speculative to state that the Hanford Barrier could "prevent" human intrusion, especially for a period longer than 10,000 years (time to reach PRGs through radioactive decay).

23. *Page 14, Summary of Remedial Alternatives, bullet on Alternative 5.* Both the FS and proposed plan fail to mention the possibility that a less robust cap may be adequate once near surface contamination is removed. This source removal might help limit potential for groundwater impacts and especially eliminate near-surface intrusion into waste (because the waste would be sent to ERDF to be buried deeper and under centralized institutional controls [ICs]) by plants, animals and people.

24. *Page 14, Summary of Remedial Actions, bullet on Alternative 6.* The trench-digging worker is the most likely limiting intruder scenario after vitrification has taken place. This scenario was not run and should be modeled and reported on in the revised FS and proposed plan.

25. *Page 15, CERCLA Evaluation and Process, bullets.* The existence of deep contamination does not mean that shallow contamination (above 15 feet) should be left behind even covered by a cap. The bullet on shallow, high-volume waste sites is especially indicative of DOE's weighting of cost over compliance with other requirements. Capping material that is close to the surface (especially above 9 feet below ground surface) does not meet the spirit of complying with MTCA or other requirements. It does not matter how large the area is. The Hanford cleanup effort should not be limited to just doing the most inexpensive cleanup, as long as it is not impracticable or technically infeasible to accomplish. Excavating down to 15 feet meets none of those criteria (impracticability or technical infeasibility). Also, shallow TRU contaminated sites are no different. Work in Idaho has shown that these sites can undergo RTD safely and that TRU contaminated soils can be certified for WIPP. Not all of the volume of the Z-Ditches is necessarily destined to have to go to WIPP, but could go to ERDF depending on how it is removed and if it can meet ERDF WAC.

26. *Pages 16 and later, side column entries with Summary of Alternative Evaluations and Preferred Alternatives section.* Please do not list what the preferred alternatives are in the side column. Or, at least do not list them until the end so that readers can judge for themselves after reading the evaluation sections.

27. *Pages 16 and later, Summary of Alternative Evaluations and Preferred Alternatives section.* Please do not provide the preferred alternative up front. Please maintain an order where the discussion starts with Alternative 1 and then 2, etc, and be consistent throughout the different groups of representative-analogous waste sites.

28. *Page 16, Alternative Evaluations, first paragraph, last sentence.* Do not just state that In Situ Vitrification is not applicable, explain why. Please do this in the other sections where this statement is made.

29. *Page 26, Short-term effectiveness.* Please note in the text that while capping does not involve potential habitat destruction through excavation at the waste site, it might involve covering areas with established habitat. This area is variable and depends on the design of the cap to cover and protect against mobile contamination that is spread out laterally at depth.

30. *Page 26, Reduction of Toxicity, Mobility, or Volume Through Treatment.* Whenever capping is selected, confirmatory and design sampling and analysis are important to limit uncertainty about whether or not the conceptual model is correct and the extent of lateral contamination is understood. One does not really know that materials removed will or will not require, or benefit from, treatment. This uncertainty is greater whenever one leaves material in the ground instead of excavating it and characterizing it for waste disposal. This distinction should be mentioned here and in all other sections where this statement has been made.

31. *Page 26, Reduction of Toxicity, Mobility, or Volume Through Treatment, sentence beginning, "Alternatives 3 and 5..."* The use of the word "perceived" is inappropriate since EPA and DOE believe that ERDF is a highly protective disposal facility. Please remove this statement wherever it appears and replace it with a discussion of how ERDF is protective and how centralized ICs there will be easier to maintain.

32. *Page 26, Reduction of Toxicity, Mobility, or Volume Through Treatment, sentence beginning, "Alternatives 3 and 5..."* The last sentence also places ERDF in an unnecessarily poor light, especially since even less can be said for the protection at these capped sites. This is because ERDF has gone through an extensive performance modeling effort that was used to ensure that its WAC is protective, even given some of the uncertainties about mobile constituents.

33. *Page 26, Implementability, second sentence.* Saying that Alternative 2 is in place is only partly true. Part of the alternative of Monitored Natural Attenuation must be the provision for corrective action if monitoring shows that it is not being protective. This is not currently being performed.

34. *Page 26, Implementability.* It would be better for readability if some of these large paragraphs were shortened or split.

35. *Page 26, Implementability, sentence beginning, "Alternative 5..."* This argument about ERDF capacity is somewhat specious because ERDF expansion is planned and ongoing for just such wastes. Please add this fact wherever this previous statement is made.

36. *Page 28, Representative Site..., last sentence.* It should be noted that the small area of the site will not matter much if an animal brings the material to the surface where it can be spread around by others and enter the food web. The rationale stated should not be provided much weight in decisions to leave material above 15 feet.

37. *Page 33, Implementability, last sentence on page.* Stating that the construction of caps is "easy" is overselling the implementability of installing them to perform over long time periods. Here and in other places where this statement is made, please revise the statement. The recent technical workshop put on by the ITRC in Boise did not indicate that installing and maintaining such barriers was "easy." It did indicate that they are implementable and that evapotranspiration caps have applicability to the semi-arid climate at Hanford.

38. *Page 34, Representative Site..., sentence beginning, "If no clean cover..."* Please indicate in parentheses after "1000 years" that the time to meet PRGs is actually longer than 10,000 years. One could just put "(more than 10,000 years)" in the sentence. This makes the level of attainment of the long-term effectiveness criterion all the more important. There are other spots in the document where this specificity also needs to be included.

39. *Page 36, Table 5, footnote "g".* This is speculative based on the unlikely scenario that the entire volume of the Z-Ditches waste site must be containerized and sent to WIPP. There was no effort made to come up with a more reasonable estimate based on survey and sampling data and the longitudinal conceptual model mentioned in the Sampling and Analysis Plan (see FS comments).

40. *Page 37, Overall Protection of Human Health and the Environment, paragraph after bullets.* The FS elaborates on the merits of capping with a set of bullets, but says a minimum about RTD. Please add to this paragraph (sentence) a discussion of how RTD is more protective of intruders. This should be done in all other places discussing Alternative 3 or 5 where the topic of overall protection is covered. Again, the order of alternatives is mixed up because of the up front discussion of the preferred alternative which should not be talked about yet.

41. *Page 38, Short-Term Effectiveness.* What are the assumptions that went into the radiological dose estimates for workers for RTD?

42. *Page 42, Short-Term Effectiveness.* The cumulative dose to workers for Gable Mountain Pond is not relevant. What is the ballpark figure for removing the 207-A Retention Basin?

43. *Page 43, Alternative Evaluations.* Please note in the text that the FS for 200-TW-1/2/PW-5 (minus the 200-BC Cribs and Trenches) has not been approved by EPA and Ecology.

44. *Page 43, Overall Protection..., second paragraph.* This paragraph is confusing because one cannot distinguish when 216-T-36 is being discussed and when 200-W-79 is the topic. Please clarify.

45. *Page 45, Short-Term Effectiveness.* Here and elsewhere in the document where both Alternative 3 and 5 are applicable, please provide the radiological dose estimate for

Alternative 5.

46. *Page 46, Preferred Alternatives.* The statements in the Preferred Alternatives sections sound more like legal statements than rationale for selection. Please add actual rationale to these sections.

47. *Page 48, Establishing the Standard Remedy.* The same comments about meeting the spirit and letter of MTCA for shallow contamination and about high-volume shallow sites that were made in earlier comments apply here and these standard alternatives need to be revised in accordance with those comments. EPA will work with DOE to revise these standard remedies and the conditions for when and to what extent the plug-in approach can be used. If another guiding document needs to be created or a part added to the TPA, that can be investigated. Relying on the outdated and generic sections of the 200 Area Implementation Plan will not best serve progress in cleanup of the 200 Areas. The 200 Area Implementation Plan was helpful for the characterization phase, but it is not well suited for the remediation phase. Discussions are ongoing about the concept of developing a separate document to help guide this phase.

48. *Page 49, Public Involvement in the Plug-in Approach, second bullet.* Probably should add "or best suited (as agreed to by the Tri-Parties)" to the end of the sentence.

EPA COMMENTS ON THE FEASIBILITY STUDY FOR THE 200-CW-5/2/4/SC-1 OPERABLE UNIT GROUP (DOE/RL-2004-24, DRAFT A)

February 28, 2005

The U.S. Environmental Protection Agency (EPA) appreciates the magnitude of the effort to put together this feasibility study (FS). The EPA acknowledges that many of the lessons learned from the development of earlier 200 Area FSs and from Hanford Advisory Board (HAB) and stakeholder discussions have rightfully influenced this document. With the exception of the 200-SC-1 operable unit (OU), these OUs are very geographically based and so will be more easily integrated with area cleanup and closure than the 200-TW-1/2/PW-5 sites (except for the 200 BC Cribs and Trenches).

The format of these comments will be to cover the overarching issues and general items. EPA requests a meeting with the U.S. Department of Energy (DOE) and the contractor to work through specific comments. The comments on the proposed plan will be submitted in a separate Word file. The comments on the proposed plan will deal directly with where DOE and EPA agree and where we disagree on the choice of preferred alternatives for representative and analogous sites, and will include EPA's rationale for its preferred alternatives.

Please reference the report (or at least summarize the work) on the additional modeling that is being performed. It would be better to incorporate it into the final revision of the FS. However, either way the additional modeling report will be included in the administrative record and, along with the FS, will be part of the basis for the decisions.

Wade Riggsbee (now with the Yakama Nation) helped sample the U Pond sediments when it was a functioning pond. He indicated that your inventory and, in particular, the maximum concentration data are significantly less than what they found at the time he was involved. EPA would like to meet with Mr. Riggsby and the DOE and its contractor (including any pertinent technical experts) to resolve any apparent discrepancies.

EPA believes that DOE continues to open itself up to criticism on the preference for capping and role of cost in remedial decision making. While the FS makes significant strides towards presenting all of the points and counterpoints of remedial alternative features and potential effectiveness, it then appears to place more weight on some of these points (or ignores them) when arriving at the rationale for selection of preferred alternatives. It is obvious to us that DOE has incorporated a bias towards capping into the approach and decision rationale of this feasibility study. The following are examples of this apparent bias:

1. The Remedial Action Objectives (RAOs), by their separation of worker and public health, are set to pit one against the other. The relationship does not have to be treated that way as one can be protective of both with the right controls and approach to cleanup.

One example of the bias against Removal, Treatment, and Disposal (RTD), is illustrated when the FS goes as far as indicating that RTD alternatives do not meet the minimizing habitat disturbance RAO (even though there are lots of things that can be done to minimize impacts in staging areas). However, in the next sentence the FS indicates that there is really very little habitat in the waste site areas because of the highly disturbed industrial setting. A case could be made that the short-term disturbance of habitat may be worth the long-term ecological benefits of removing contaminants from the particular site. The RAOs need to come in line with other FSs from the 200 Area to take this structured bias out.

2. The implementability and cost comparison is warped toward capping in the case of the Z-Ditches, where the FS settles on a scenario in which the entire volume of the waste sites (216-Z-1D, 216-Z-11, and 216-Z-19) would have to be containerized and sent to the Waste Isolation Pilot Plant (WIPP) in New Mexico. There was no attempt to use the characterization data and an important aspect of the conceptual model (will describe below) to determine a more realistic estimate of what would have to go to WIPP and what could go to the Environmental Restoration Disposal Facility (ERDF) here at Hanford.

   There was an omission in the FS of the logic that went into the siting of the borehole. The FS actually indicated there was no way to select hot spots and this was part of the justification for counting the entire waste site volume (regardless of clean cover, or the lower contamination further below, that could be utilized in a flexible excavation process) in the waste stream to go to WIPP. However, the 200-CW-5 SAP guided an investigation strategy where a gross gamma/passive neutron (GG/PN) logging system was applied to find hot spots. The results were used along with the conceptual model that transuranic contaminants would settle out wherever flow rates diminished in the ditches. The borehole was located just upstream from a spot where flow was impeded by the narrowing of the ditch through a culvert that went underneath a street. The samples analyzed from this borehole did indeed have extremely high TRU contaminant concentrations. Finally, the fact that there is significant variability within the ditch does not necessitate that DOE write off the entire length, depth and surrounding material around these ditches as destined for WIPP.

3. The FS does not adequately address the alternative of In Situ Vitrification (ISV). There is a lack of detail on processes and equipment necessary and how conducive local soils might be to this alternative. At one point near the end of the FS, there is a statement that more has to be done to determine whether or not ISV is a viable alternative. This should have been answered by the feasibility study and so if it cannot answer it, the current FS is inadequate with regard to the assessment of this alternative.

   It should also be noted that in the case ISV of a vitrified Z-Ditches mass within the shallow zone, the trench-digging intruder might be the limiting intruder scenario rather than the person growing crops in contaminated drill cuttings. The trench-digging scenario should be run for the alternative to facilitate the decision making process.

4. Worker dose is mentioned as an important issue, yet the FS does not provide (at least in the main text) actual predicted values for Alternative 5 (partial RTD and capping). It is not sufficient to just state that cumulative worker dose will be about the same as Alternative 3.

5. Citing the current ERDF remaining capacity as a consideration for RTD is a rather specious point because ERDF is going to continue to be expanded to accept remediation waste and because no one expects DOE to actually excavate down to 200 feet below the ground surface as in the full-removal case for some of the sites where Preliminary Remediation Goals (PRGs) are exceeded to that depth. EPA believes that the limited benefits of such deep excavations (over the protection offered by capping, or partial RTD and capping) do not correspond to the greatly increased worker risk (both industrial and radiological) and difficulty in implementation (huge hole that encroaches on facilities and services and would require elaborate shoring and set back).

6. The costs for capping appear to be underestimated in one regard (at least according to the main text) since the FS does not account for groundwater monitoring costs, but instead says that the various groundwater OUs will do this monitoring. If this is true, this is unacceptable and EPA believes this is inconsistent with the CDI FS. Actually, the CDI FS may have gone too far to where it predicts the CDI U Plant will pay for all of the monitoring when costs will likely be shared with other projects within the U Plant closure zone. This sharing across the closure zone would be the most appropriate, except where you have individual Treatment, Storage, or Disposal (TSD) requirements (there are no TSD facilities assigned to these OUs). EPA understands that the costs of monitoring well replacements were factored into the estimates.

7. At this point in the 200 Area planning effort, the FSs need to better define the source and quantities (and types) of borrow material. Obviously, design work will affect predictions. One example of a possible obstacle to applying the current FS's preferred alternative for the Z-Ditches is the promise the Tri-Parties made to the Tribes that basalt onsite would be off limits as a source of intrusion protection layering material. Where is DOE going to get the rock to form this layer of the 0.8 of a mile long Hanford Barrier-type cap?

8. It appears that DOE is trying to count the thickness of the caps to meet MTCA requirements or DOE is implying that it intends to make use of provisions within MTCA that allow for barriers over shallow waste. We do not believe that DOE will meet the spirit of MTCA by capping over waste that does not meet PRGs and starts around 2 to 4 feet below the surface as is the case with the U Pond. You also do not show that you have satisfied any provision to use an alternate depth that would allow these materials to remain so close to the surface even with a cap.

9. Finally, there is no evidence in the FS that DOE studied whether or not savings could be achieved in cap rigor and expense under Alternative 5 as opposed to Alternative 4. The FS did not discuss the idea that a cut and cap approach might require a surface barrier that either would not have to perform to as high a level or could be constructed at a very low profile (possibly even at grade with shrub steppe vegetation).

Many of the issues touched upon in the items above have been commented on in the review of other documents and are currently (or will be shortly) being addressed by the Central Plateau work group or smaller focus groups. They will be the subject of discussions with the IAMIT (InterAgency Management Integration Team) Little Gang team of managers. EPA looks forward to working to solve issues and to promoting objective evaluations within FSs so that we can make the best cleanup decisions possible for Hanford waste sites to protect human health and the environment.

To echo some of the comments from the USGS, EPA believes that the ecological risk evaluations in this FS must be supplemented by the larger 200 Area ecological risk assessment effort to be complete. The FS and the proposed plan should contain a short description of the 200 Area ecological risk assessment effort and its current schedule and explain how information from it might be utilized by this remedial action (even though the ROD could be signed before the results are back from the larger effort). Discussions with our legal experts in the region (presently reviewing the 200-UW-1 proposed plan) have driven home the need to make the connection in these documents with the more comprehensive, site-wide look that the 200 Area ecological risk assessment will take.

The EPA appreciates the inclusion of the partial RTD and capping and ISV alternatives in response to early informal comments and lessons learned from other OUs further along in the RI/FS process. We believe that the Tri-Parties (DOE, EPA, and the Washington Department of Ecology) are beginning to grasp the shortcomings of our investigation strategies that were aimed at selecting from "all or nothing" alternatives (e.g., full RTD vs. capping). The concepts of partial removal including hot spot removal (both vertically or laterally), as well as better information on the effects of thin layers of fine-grained sediment on contaminant distribution within the vadose zone, have led to additional pre-Record of Decision (ROD) sampling in the first two soil OU RI/FSs. Uncertainties regarding the fate and transport of Tc-99 in the vadose zone have also prompted additional characterization using innovative approaches that may continue to yield benefits site-wide.

The EPA does not believe that additional pre-ROD sampling is necessary for the waste sites in the OUs covered by this FS as long as questions about sampling and analysis results for the U Pond are satisfactorily answered. The one exception might be for the 216-T-36 Crib and its representative site the 216-T-26 Crib. The 216-T-26 Crib (actually within the 200-TW-1 OU) still has some unresolved concerns about the modeling of deep Tc-99. Hopefully, DOE will continue to work with EPA and our U.S. Geological Survey (USGS) experts to determine a way to realistically model the distribution of Tc-99 as detected in borehole samples.

We appreciate DOE's willingness to undertake a treatability study for Tc-99 and to work with the regulators and USGS to make it useful for waste sites across the central plateau that have Tc-99 or other mobile constituent issues. This effort will help ensure that the challenge of deep contamination does not slip between the somewhat artificial divide of soil site remediation and groundwater protection and restoration programs. Finally, the characterization approaches for other OUs will need to be assessed in the light of the lessons learned from early RI/FSs so

that further sampling and analysis can be focused on planned post-ROD activities carried out for confirmatory, design, or verification reasons.

Additional EPA Comments on the Feasibility Study for the 200-CW-5/2/4/SC-1 Operable Unit Group (DOE/RL-2004-24, Draft A)

March 1, 2005

Specific Comments

(See prior comments dated February 28, 2005 for general comments about the feasibility study. Comments that are redundant in content and provide no further insight from the general comments will not be listed.)

1. *Page 1-2, Section 1.0, first full paragraph, last sentence.* It is not clear what the specific needs for RCRA-CERCLA integration are. There are no Treatment, Storage, or Disposal (TSD) units in these operable units (OUs). It is preferable that all of the waste sites be CERCLA Past Practice (CPP) units rather than some of them being RCRA Past Practice (RPP) units when EPA is the lead regulator. The DOE and EPA should consider creating a change package to address this.

2. *Page 1-2, Section 1.0, second full paragraph.* Are the two pipelines part of the 200-IS-1 OU and were just opportunistically characterized under this RI/FS effort? Please clarify.

3. *Page 1-2, Section 1.0, third full paragraph, first sentence.* Please state whether or not the change package has been approved.

4. *Page 1-3, Section 1.1, second to the last sentence.* Please also indicate that the rest of the administrative record file will also be part of the basis for the decision.

5. *Page 2-7, Section 2.1.2.4, second paragraph, first sentence.* Where did the rest of the steam condensate from the evaporators go?

6. *Page 2-10, Section 2.2.4, last two full sentences on the page.* It appears that the recharge rates are switched.

7. *Page 2-11, Section 2.2.4, first paragraph, second to the last sentence.* Some examples could be provided to indicate the latest information about fine-textured layers at depth and the moisture and associated mobile contaminants they frequently contain.

8. *Page 2-17 to 2-18, Section 2.4.1.1, sentence that carries across the pages.* Please don't just list the radionuclides, provide inventory estimates.

9. *Page 2-20, Section 2.4.1.3, second to last sentence.* How were the inventory estimates erroneous?

10. *Page 2-20, Section 2.4.1.4, first paragraph, second to last sentence.* Please be consistent with the formatting of numbers.

11. *Page 2-21, Section 2.4.1.5, fourth paragraph.* Why was there surface contamination that had to be removed?

12. *Page 2-26, Section 2.5, last sentence.* Should explain that lateral spread is to be investigated further during confirmatory sampling.

13. *Page 2-37, Section 2.6.2.2, item #1.* This deeper contamination on the edge gives credence to the concept raised in discussions about confirmatory sampling for the 200-UW-1; the idea that mobile constituents are present in higher concentrations in a ring that spread out from the source along fine-textured layers.

14. *Page 2-40, Section 2.6.2.5.* What is the leak history for the 200-W-79 Pipeline? The shallow nature of limited releases should be indicated if that is the case to distinguish from the crib.

15. *Page 2-40, Section 2.6.2.5, last sentence.* Of course, the contamination in the sludge, while lower in volume, would be very concentrated.

16. *Page 2-40 through 2-47, Section 2.7.* This would be a good place to include (or at least reference) the additional modeling from the report being developed once this FS is revised.

17. *Page 2-43, Section 2.7, second paragraph, first sentence.* This sentence does not quite make sense. Please explain in this section what was done differently in the additional modeling.

18. *Page 2-43, Section 2.7.1.* Please revise to incorporate comments about how the response to the HAB advice has been clarified. This section should be consistent with the revised section of the 200-UW-1 FS.

19. *Page 2-45, Section 2.7.2.* This is probably a good place to mention the requirement to contribute to no further degradation to groundwater from contaminants leaching from the waste sites.

20. *Page 2-45, Section 2.7.2.2, last paragraph.* Please discuss Nuclear Regulatory Commission regulations that have to do with the 1000 year time period. Were these regulations examined as potential ARARs?

21. *Page 2-47.* Table 2-3 is referenced as having the dose rates for sites without cover. Actually, Table 2-3 is an important summary of the risk assessment effort and should be included in section 2.7.2.2. Tables 2-4, 2-5, and 2-7 are also important summaries and should be moved up in the text or at least referenced.

22. *Page 2-47, Section 2.7.3.* This would be a good place to discuss the wider central plateau ecological evaluation report and the baseline terrestrial ecological risk assessment for the 200 Areas. See other comments on this topic.

23. *Page 2-48.* Groundwater protection is not a risk assessment, but it is included in the Risk Assessment section. Groundwater is not a pathway used in the risk assessment. This important topic should not be buried in this section but should be covered in a separate section.

24. *Page 2-48, Section 2.7.3.* How does the sludge from the one trench compare to the representative site as far as ecological risk?

25. *Page 2-48, Section 2.7.3, second bullet on page.* Please explain the statement that more ecological evaluation is necessary for the PCBs in the 216-Z-11 Ditch.

26. *Page 2-49, Section 2.7.4.* Please reference the sources of information for the STOMP modeling done for other representative sites.

27. *Page 2-49, Section 2.7.4.1, last bullet.* Why are the RBCs based on the shallow zone samples?

28. *Page 2-51, Section 2.7.5, first paragraph, last two sentences.* Please describe how the additional modeling performed recently differs from this description.

29. *Page 2-57, Section 2.9.3, second paragraph.* This discussion of hot spots is in contradiction with the survey data and lateral conceptual model from the Sampling and Analysis Plan that targeted the location of the borehole. See comments on the FS.

30. *Page 2-*58, Section 2.9.4, fourth bullet, last sentence. It is not true that Gable Mountain Pond is in an industrial setting. Please distinguish between this pond that is not part of the remedial action and the analogous site.

31. *Page 2-*59, Section 2.9.5. The STOMP modeling issues with regard to Tc-99 have not been fully resolved for the 216-T-26 Crib. The DOE should continue to work with EPA and the USGS to develop a reasonable approach to simulating the hold up of water and Tc-99 in the vadose zone that is indicated by borehole sampling data.

32. *Page 2-82, Figure 2-15.* This does not seem to account for the intruder scenarios. This fact should be mentioned in a footnote.

33. *Page 2-106, Table 2-6, column on time to reach PRGs.* Please indicate in parentheses the actual estimated time to reach PRGs for each entry.

34. *Page 3-1, Section 3.0, second paragraph, last sentence.* Please indicate that the remediation goals are preliminary until finalized in the ROD.

35. *Page 3-6, Section 3.1.4.* Need to acknowledge additional modeling work and its purpose.

36. *Page 3-9, Section 3.5, first sentence.* They won't be preliminary in the ROD.

37. *Page 3-10, Section 3.5.2.1, first paragraph, last sentence.* This is a good way to write it.

38. *Page 3-12, Section 3.5.2.2.* It would be beneficial to discuss the central plateau ecological risk assessment and its more inclusive COC approach.

39. *Page 3-13, Section 3.5.3.* Please discuss the no further degradation requirement.

40. *Page 3-14, Section 3.5.3.2, first full paragraph, first sentence.* Please add the micro symbol in front of grams.

41. *Page 4-12, Section 4.3.* Even though partial RTD and capping isn't a specific technology, it is an important combination that deserves more than one sentence of coverage.

42. *Page 5-2, Section 5.1, first paragraph.* All of the alternatives are covered but plain capping.

43. *Page 5-9, Section 5.2.6, second paragraph, last sentence, first parenthetical.* Thank you for mentioning the difficulties in capping something with the geometry of these ditches.

44. *Page 6-6, Section 6.1.8.* This discussion of state acceptance should not include EPA which is a federal agency and the lead regulatory agency for this remedial action. Please note that EPA also writes the ROD.

45. *Page 6*-15, Section 6.2.3, second paragraph, last sentence. The disposal site must be WIPP if over 100 nCi/g. Please revise.

46. *Page 6*-15, Section 6.2.3, last sentence. This is true except for ERDF which does not require a permit as a CERCLA disposal facility meeting RCRA technical requirements. An extensive risk assessment was performed and helped establish the waste acceptance criteria.

47. *Page 6-18, Section 6.2.3.5.1, first sentence.* The fact that these activities might be classified as nuclear is another reason for not leaving this material around for future generations to come across or deal with.

48. *Page 6-19, Section 6.2.3.5.2, first paragraph, second to last sentence.* It should be noted that there were many ditches and ponds that were open to the air when site operations were happening.

49. *Page 6-20, Section 6.2.3.5.2, first paragraph after bullet.* The discussion of Gable Mountain Pond is not relevant to these operable units except as a representative site. Please delete discussion or explain this. This issue recurs in later sections.

50. *Page 6-21, Section 6.2.3.5.3.* These assumptions about the number of excavators seem a little ridiculous. Also, the estimate of how much waste ERDF can accept in a day is off by about a factor of 10.

51. *Page 6-21, Section 6.2.3.5.3, last bullet.* Why are the analogous sites not mentioned here? Please discuss them. This same comment applies in following sections.

52. *Page 7-3, Section 7.2, fifth paragraph, last sentence.* Then employ adequate worker protections.

53. *Page B-2, Section B1.0, first full paragraph, last two sentences.* Are there any RCRA units that will need to be incorporated into the permit?

54. *Page B-5, Table B-1.* This table should have already been consistent with tables in numerous documents reviewed by EPA. The ARARs and their applicability must be consistent with the revised 200-UW-1 FS (with the exception of ARARs necessary for TSD units).

55. *Page C-18.* Why is an irrigation rate of 0.76 m used in the evaluation of groundwater protection? Is irrigation included in the industrial scenario? The reason for including irrigation should be stated.

56. *Page C-21.* Why are different Kd values used for the 216-T-26 Crib than those used for the other sites? The Kd values are markedly different. For example, the Kd for Co-60 used for four sites is 1200 whereas the 216-T-26 crib uses a Kd of 0 for Co-60. There are other marked differences.

Richard S. Dinicola
USGS – Tacoma, WA
1/6/04

To: Craig Cameron, EPA Richland

Re: USGS review of *"Proposed Plan for 200-CW-5, 200-CW-2, 200-CW-4 and 200-SC-1 Operable Units"*, DOE/RL-2004-26 Draft A

As requested, this review focused on the 200-CW-5 Operable Unit. I also reviewed selected parts of the companion Feasibility Study (DOE/RL-2004-26 Draft A). I was not able to technically review the STOMP modeling work because details of the actual modeling exercises were not included in the reviewed documents. However, previous USGS reviews of STOMP modeling at the 216-T-26 Crib identified several unresolved technical issues in the modeling approach.

General Comments

Analogous Site Approach

The potential advantages of using the analogous site approach are obvious, but limitations to the approach became apparent during my review. Foremost is the uncertainty that the representative sites are "worst case" sites as is presumed. Table C10 in the Feasibility Study (FS) indicates that the highest RESRAD dose results for the next 200 years at the 216-U-10 Pond is from Cs-137. However, at six of the ten analogous sites with data available (FS, Table 2-2), the contaminant inventory of Cs-137 *exceeds* that of the representative site even though the volumes of effluent to the analogous sites were less. With regard to total uranium, all ten analogous sites with data available have contaminant inventories that exceed the inventory at the representative site. Thus, the 216-U-10 Pond does not appear to represent the worst case, and there may be substantially higher risks at some of the analogous sites. Given those uncertainties, the quantitative risk results presented in the FS for the representative sites cannot be assumed to represent or "bound" the risk at analogous sites.

Two analogous sites do not appear to be well represented by the 216-U-10 Pond representative site. The lack of contamination at depth beneath the 216-U-9 Ditch and 216-U-11 Ditch and the resulting low potential for ground-water contamination indicates that they are substantially dissimilar to the 216-U-10 Pond. Thus, remedial alternative 3 (RTD) should be re-evaluated for those ditches to consider removal of shallow soils only, and alternatives 4 and 5 should be re-evaluated to reflect that ground-water protection is unnecessary.

It is not clear how the proposed additional sampling data for analogous sites will be used. Will risk be reassessed with additional RESRAD runs if substantially more contamination is found? The additional data will presumably help define the extent of excavation or capping needed, but there is no apparent mechanism to reconsider whether capping or excavation is still the most implementable and effective remedy in the short term.

Preferred Alternatives

Although the spatial distributions of contaminants at the sites are not described, there is undoubtedly substantial variation, particularly across the area of the larger ponds and longer ditches. It is likely that the RTD/capping alternative could be tailored for individual sites to consider only removal the most severe near surface contamination.

The selection of capping as the preferred alternative for the 216-Z-11 Ditch and analogous sites is questionable. The Reduction in TMV criterion was rated only as "moderate" for the RTD alternative at these sites, whereas it was rated as "high" for every other site considered. The verbiage describing Reduction in TMV on page 38 of the Proposed Plan is identical to that for all other sites, so there is no apparent reason to downgrade the effectiveness of RTD for the Z ditches only. In addition, the long-term effectiveness of capping the Z ditches is over-rated—the contaminants will require a longer duration (>1000 years) to decay to acceptable levels than the design life of a cap (500 years). Thus, long term effectiveness of the capping would be low.

The RTD alternative in general is described as providing a "perceived" risk reduction only. Given the historical difficulties in accurately tracking and managing wastes at the Hanford Site over the past 60 years, it is a reasonable assumption that any activities that simplify long-term waste management would provide a very real reduction in risk. Thus, excavating and consolidating wastes from multiple dispersed sites into a single more managed facility (the RTD alternative) would provide a substantial reduction in risk in the long term.

Specific Comments (Proposed Plan)

<u>Page 12, Summary of Site Risks, fourth bullet</u>

The ecological risk conclusions in the Proposed Plan are not well supported by the information presented in the FS report (see FS report comments on Section 2.7.2.2 and Section 2.8).

<u>Page 16, third paragraph</u>

Statement that "Because a clean soil cover exists at the site, these contaminants do not currently pose a risk to Hanford Site workers" applies only to the representative site. For reasons previously discussed, the risk from radiation at certain analogous sites is unknown.

<u>Pages 16-27, Summary of Alternative Evaluations and Preferred Alternatives, 216-U-10 Pond and analogous sites</u>

The preference of alternative 4 over 5 for most sites in this group is a subjective one. It could be argued that partially satisfying all balancing criteria (alternative 5) is preferable to "best" satisfying the shorter-term criteria (short-term effectiveness and implementability) while only marginally satisfying the longer-term criteria (long-term effectiveness and reduction in TMV). The alternative summary in Table 3 does give the impression that the most expedient and least costly alternative is preferred. The associated discussion somewhat tempers that impression by reminding us that radioactive decay will reduce the surface risks to acceptable in 280 years—it would help to remind the reader that the proposed caps have design service lives of 500 years. However, that 280-yr attenuation estimate applies to the representative site only—many analogous sites

may require longer times for attenuation to be effective. Overall, it is difficult to argue technically with the selection of the capping alternative assuming (1) the caps and institutional controls can be maintained long into the future as proposed, and (2) the representative site is the worst case scenario. The latter assumption is unproven, and the former is uncertain.

Page 26, Cost
It is unclear why a RTD depth of 210-ft was selected for 216-U-10 Pond and analogous sites. The conceptual model describes contamination down to a depth of 140-ft only.

Page 30, second bullet
If ground-water protection is not an issue for the Z ditches, the reduction of infiltration through capping would have no impact on the protection of human health and the environment.

Page 49, Alternative 6
The conditions described do not match any of the plug-in Conceptual Site Models. Do you need a sixth conceptual model in the mix? It appears that "significant concentrations of transuranic radionuclides in shallow soils that pose significant worker risk" is the distinguishing feature.

Specific Comments (Feasibility Study)

Section 2.6, page 2-33
How is it known that the representative sites reflect worst case conditions? That is particularly questionable for the 216-U-10 Pond—the total uranium mass at every analogous site and the Cs-137 and Sr-90 inventory at many analogous sites are greater than that for the so-called representative site.

Table 2-2
This table contains some speculative or erroneous statements. Specific comments are as follows:

- What does '--'signify in the contaminant inventory columns? No data available or no contaminant found?
- The phrase "the inventory for this site is bounded by the 216-U-10 Pond" or similar is used often in the rightmost column. Most readers expect that phrase to mean the representative site has more contamination (in either mass of radiation) than the analogous site. The contaminant inventory data suggest that the phrase does not mean that. For example, the total uranium mass at every analogous site with available data is greater than that for the so-called representative site 216-U-10 Pond.
- The total U and Pu inventory for the 216-T-12 Trench is referred to as "less than the representative site" but the inventory at the representative site is not shown.

Table 2-3
Long-term radiation risk at the 210-U-10 Pond is from Th-232, but that is not listed in description of representative sites (table 2-2). Although the 1,000 year dose calculated for

the 210-U-10 Pond was <15 mrem/yr, the long-term risk may exceed 15 mrem/yr at the analogous sites if they have more thorium. If that is the case, capping would not be effective in the long term because the design life of a cap is less than 1,000 years. This is another example of the uncertainties that result from the analogous site approach.

Section 2.7.2.2, Radiological Results (risk assessment)
The next-to-last statement of the second paragraph on p. 2-47 is not consistent with the results shown in appendix Table C-12. Doses at three of the four sites remain under the 15-mrem/yr standard for 1,000 yrs, but the dose equals 15 mrem/yr at the 216-Z-11 Ditch in 500 years, and is 34,000-mrem/yr in 1,000 years. In addition, dose rates begin to increase after 300-yrs at the 216-U-10 Pond as well as at the 216-Z-11 Ditch.

Section 2.8, Evaluation of Ecological Significance
There are few data or objective information presented to justify many of the ecological risk assessment conclusions. The Section 2.8 detailed evaluations on a site by site basis are subjective and somewhat unrealistic because they do not consider all waste sites within a potential receptor's (terrestrial animal) home range. The conclusion that animal usage of ditch areas would be limited because of the "miniscule" areal extent of a Representative Site does not take into account the cumulative effects of all waste sites in the vicinity. An animal (or population) may not use a single Representative or Analogous site exclusively for foraging and shelter, but it seems probable that it will spend a lot of time at various waste sites within the 200 Area. The following specific conclusive statements are poorly supported, and should be tempered by considering cumulative risk in the broader 200 Area:

- Section 2.8.2, sentences 4, 5, 8, and 9
- Section 2.8.3, sentences 2, 3, 8, and 9

The overall conclusions presented in the first paragraph in Section 2.8.6 are also poorly supported. In particular, the cumulative risk of the three representative ditch and crib sites was not evaluated, and the risks from those three individual sites also extend to their associated analogous sites.

I agree with the final statement in the section that recommends no additional ecological evaluations at individual sites. A cumulative ecological risk evaluation of the 200-Area may be warranted, although human health appears to be the primary risk at the Operable Units.

Appendix E, Page E-1, third paragraph
It is highlighted that the intruder scenario risk analysis was done separately for the Z-11, Z-1-D and Z-19 ditches "to avoid drawing conclusions for all three ditches based on results from just one." However, the latter two sites were previously assumed to be analogous to the 216-Z-11 Ditch. It appears that the authors have the same lack of confidence in the transferability of risk results from representative sites to analogous sites as are expressed in previous comments.

If you have any questions about the comments, please contact me by phone (253) 428-3600 x2603, or e-mail (dinicola@usgs.gov). These comments have not been approved by the Director of the U.S. Geological Survey and therefore do not represent an official USGS position.

Washington Department of Ecology Comments on the 200-CW-5 RI/FS Work Plan, Revision 1 Reissue DOE/RL-99-66

Comment #	Page, ¶	Comment
1.	General	There is no inclusion of the observational approach listed in the 200 area implementation plan being considered for the 200-CW-5 RI/FS identified in the work plan. In particular, for the pipelines such as 200-W-102, the remove/treat/dispose option is a viable one. The FS and proposed plan includes the observational approach as a preferred remedy; therefore, it should be included in the work plan. At a minimum a discussion of how this approach could be used for cleanup should be included.
2.	General, §5.3	Treatability tests were not discussed in the work plan. Per CERCLA guidance, treatability investigations need to be evaluated and included in the FS report. The work plan should identify plans to evaluate whether treatability investigations will be required.
3.	General, UP-1 integration	No discussion in the work plan is included that discusses integration of the 200-CW-5 OU with the 200-UP-1 OU. Although they are separate OUs, 200-CW-5 is an important contributor to groundwater contamination for 200-UP-1. At a minimum, discussion should be added to section 2.1.4, 3.3, and in section 5.0
4.	General	The executive summary of the 200-CW-5 RI report, 1st paragraph; discusses that significant data from 216-Z-1D and 216-Z-19 ditches were used in evaluating the baseline risk. The work plan does not include a discussion of this data and how it was obtained. Although these sites are not being used as representative sites, if the data is being used for an evaluation of the baseline risk, it should be discussed in the work plan and outlined how the data will be used.
5.	Table 2-2, 2-3, and 2-4	Several analogous representative sites are identified (207-A South, 200-E-111, 216-A-10 crib, 216A-37-1, 216-B-12 drib, 216-T-33 crib) that are not used in the FS to evaluate these OU sites; instead all waste groups were evaluated based on only 5 analogous sites. If only the 5 analogous sites were used, these tables should be updated to point to the appropriate analogous representative sites for the waste sites in this work plan.

Comment #	Page, ¶	Comment
6.	§3.3, pg3-3, 2nd ¶	"the OUs are not a major source of groundwater contamination" is not an accurate way to describe the impacts to groundwater from this OU. Although it specifically states in the next sentence that 216-U-10 Pond and the 216-U-14 ditch have contaminants in the groundwater, this OU should be characterized as a major contributor to the 200-UP-1 groundwater OU contamination. Revise the entire paragraph to reflect this, and specify the primary contaminants released to groundwater from these 2 sources.
7.	Figures 3.8, 3.9, 3.10	These figures show some lateral spreading of contamination, as was discussed in the chapter. However, the caption says after the lateral spreading the contamination proceeds vertically downward; however, the figure shows the contamination concentrating once again in the P1 and RE layers. This is not representative of the captions of the figures; please revise with a true vertical distribution after the H2/P1 layers.
8.	§5.3, pg 5-14	No mention is made of evaluating the remove/treat/dispose action alternatives in this section. This alternative is included in the FS and proposed plan, and should be included in this section.
END		

200-CW-5 FS,
DOE/RL-2004-24, Draft A

Comment #	Page, ¶	Comment
9.	General	The FS does little to discuss integration of these OUs with the groundwater OUs (i.e. 200-UP-1 for contamination from U pond). Although the 200-UP-1 is discussed with relation to groundwater at several points of the document (for example §1.2 and §3.1.4), the FS fails to discuss how to best limit future impact on 200-UP-1 through remediation decisions in 200-CW-5. See comment #3 above.
10.	General	Lateral spreading was discussed in the work plan to be evaluated in the FS; however, the FS contains little or no information about this issue. Add discussion throughout the document discussing how lateral spreading could affect barrier installation at sites, and how this issue is being addressed when designing barriers. (see comment#15 below for specific example of revised section).

Comment #	Page, ¶	Comment
11.	General, chapters 6 & 8	In general, for 216-U-10, not enough information was presented to display how installing a barrier will be protective of groundwater, considering that groundwater protection standards are exceeded at significant concentrations for this site (as stated in Table 2-2 and appendix C). At a minimum a table or preferably modeling figures should be added to the FS displaying how the modeling results are altered with the addition of a 500 year barrier, and referenced in these chapters. This should also be the case for any site that exceeds groundwater protection standards and where capping is recommended. These figures should be similar to ones presented for 200-UW-1 about the reduction of risk after installation of the barriers.
12.	2-17	216-U-10 Pond was a significant contributor to groundwater contamination; include this in the description to better align with information presented about gable mountain pond having Sr-90 in the groundwater.
13.	§2.4.2	Data used from 216-Z-1D and 216-Z-9 as bounding cases from the RI report and discussed in subsection 2.4.2.3 are not included in the discussion of data collection activities in this section. Include these sources in this general section with an explanation of why this data was used.
14.	§2.4.2.3	This section does not provide a summary of the 2002 sampling of the 216-Z-11 ditch that is referred to in section 2.4.2. Add characterization information about this sampling to section 2.4.2.3, at a minimum, which reflects the amount of information presented for gable mountain pond and 216-T-26 crib summary (sections 2.4.2.4 and 2.4.2.5)
15.	§2.6.2.1 to §2.6.2.5	Under the titles "*Expected Distribution of contaminant*" in each of these sections fails to discuss possible lateral spreading of contaminants. The CSM in the work plan discusses lateral spreading in each of the 3 representative sites in the 200-CW-5 OU; revise these sections to address this in the distribution of contaminants.
16.	§2.7 general; §2.7 pg 2-42	The failure to consider a residential scenario and future native American scenario is not in-line with HAB advice #132, which assumes an industrial setting but that is only out to institutional controls at 150 years. The FS should consider a residential and native American scenario at the +150 years, after taking into account radioactive decay.

Comment #	Page, ¶	Comment
17.	§2.7, section 2-43 2nd¶	Standard method B must be used for calculation of groundwater protection values, to restore the groundwater to the most beneficial levels. If an alternative fate and transport model is used, it must be justified per WAC 173-340-747(8). Revise the text in this paragraph to specifically identify either standard method B or the alternative (with the justification of the alternative).
18.	§2.9.3, pg-2-57	Groundwater protection standard is listed as not required because modeling indicates that it will not reach the groundwater; however, both Aroclor-1254 and nitrite currently exceed groundwater protection standards. Therefore, this bullet should be revised to state that groundwater protection standards are currently exceeded. Revise this issue throughout the document with relation to groundwater in the Z-11 trench.
19.	§2.8, §3.5.1.2	Evaluation of ecological significance in the post 150 years period should be included in this section (see comment#15 above)
20.	Table 2-3	Groundwater protection standards are exceeded for 216-Z-11 ditch based on initial screening, however, the table indicates that groundwater protection is not required, presumably due to the footnote that STOMP indicates that groundwater protection standards will not be exceeded. Revise this table to indicate groundwater protection is required, as groundwater protection standards are currently exceeded. If modeling is used to dismiss this pathway, add a section to the text to indicate this.
21.	§3.1	Discussion should be added that the future 200 area classification of industrial use should only apply to the next 150 years, when the institutional controls are assumed to end.
22.	§3.5.12, pg. 3-10 2nd paragraph	The Central Plateau ecological evaluation has presented data indicating that 90% of the biological activity at Hanford probably occurs in the upper 9 feet of the soil column. Some activity has been observed down to 12 – 15 feet. Although a conditional point of compliance may be appropriate in some circumstances, it would not be appropriate for higher concentration or higher activity waste, where the consequences of biological intrustion into the waste would be moderate to severe. In addition, the cited WAC regulations are appropriate where there is a significant barrier to biological intrusion, e.g., a paved area or concrete foundation. That is not the situation at these waste sites. Retain the standard point of compliance: 15 feet.

Comment #	Page, ¶	Comment
23.	§4.0 general comment	Treatability texts need to be identified for this OU, as required in CERCLA guidance. A treatability test was identified as being performed on the prototype for the Hanford barrier; however, further treatability tests for this OU need to be discussed and identified, or provide justification.
24.	§6.2.4	Alternative Barriers have been found to out perform RCRA C barriers at a much lower cost. Alternative barriers require more up front engineering and site characterization costs than a RCRA C barrier, but those costs are more than compensated by the lower construction costs. Designating a Hanford Barrier is conservative for a barrier cost estimate.
25.	§6.2.4.1	Overall Protection of Human Health and the Environment: The designation of a 1,000-year protection period for the Hanford Barrier is still not addressing the 24,000 year half-life of plutonium. How is placing a Hanford Barrier attenuate the human health risks associated with the long half-lives of TRU compared with the entombment of such waste at a geologic repository? Some characterization sources indicate the 90+% of the plutonium is contained in ~ 200 ft^3 of segments. Alternatives of segregating and "mining" such sediments as a means of remediating the site would greatly decrease impact risks.
26.	§6.2.4.3	Long-Term Effectiveness and Performance: The discussion only addresses the two assumed barrier designs, RCRA C cap and the Hanford Barrier. Alternative barriers are viable for arid lands and have been shown to out perform RCRA barriers. There is no discussion on performance aspects of the identified barriers except generalities. Specific attributes need to be addressed, especially with contaminates that have very long half-lives and toxic characteristics.
27.	§8.1.1	The remediation alternative for 216-U-10 should coordinate with the 200-UP-1 groundwater OU to protect future groundwater impacts. Revise the text to include how capping will help with the remedy for 200-UP-1
28.	§8.1.3	"Groundwater protection is not required" should not be stated in this section. 2 analytes exceeded groundwater protection values for 216-Z-11. Revise text to include dismissal of groundwater protection due to modeling.
29.	§8.1.3	Capping should not be the preferred alternative for 216-Z-11 ditch, where contaminants exceed the TRU criteria of 100 nCi/g. The alternatives that should be discussed are RTD and in-situ vitrification only. Revise section of text to select one of these remedies at shallow contaminated sites.

Comment #	Page, ¶	Comment
30.	Appendix D Cost Estimate Backup	General comment: Need to address the concepts of accuracy verse precision. Using seven significant figures as a cost basis with assumptions that are only good to two significant figures gives the illusion of precision, but the resulting cost estimate is no more accurate.
31.	D3.1.1	It is advisable to use the State of Washington prevailing wage rates for the bounding job classifications presented in the D3.1.1 Labor costs for a contractor rather than specific labor costs given by Flour Hanford. Provide specific reference for the assumed labor costs; e.g., Fluor Government Group contract. Fluor Hanford labor rates need to have the note that the labor rates are averaged company rates and may vary (significantly) depending on assigned individuals. Provide the specific reference for the assumed labor rates, e.g., based on FY-2004 normalized labor rates for the given labor category.
32.	D3.1.2	Markups: There needs to be previsions for the change in markup for overtime and premium pay situations or incorporate in the assumptions that the cost estimates do not include overtime or premium pay options.
33.	D3.1.3	General Assumptions: Disagree with the assumption to exclude from the costs estimates the costs for design, work plan preparation, or other preparatory project costs. For some alternatives such costs can be sizable. Agreed that equipment rental rates can be normalized to a 21 day month, 8 hour day, and 5 day week; however, there needs to be some previsions for surcharges in rental rates should additional operating hours and "off-times" be required to facilitate transport conditions, or state in the assumptions that such costs are not included.
34.	D3.1.4	Long-Term Groundwater Monitoring Costs: Reference the basis for the assumed number of sites in each closure zones. Reference the basis for $180,000 per well estimate; whether it is based on budget cost, or even better, actual costs of the last well install, and reference the date when it was installed. Provide sample analysis cost basis, and the laboratory were the sample analysis is to take place. The estimate cost for sampling event is assumed to be $300. Provide specific for this assumed cost. Provide the reference basis for the sampling event frequencies. Clarify the groundwater monitoring costs, break out administration costs and baseline staff requirements assumed, and if contracted, so state.

Comment #	Page, ¶	Comment
35.	D3.2.1	General Assumption – Alternative 2: Using a different cost estimating methodology to the other three alternatives lends itself to inconsistencies when comparing costs. Secondly, Analogous Site determinations based on area can lead to skewing the estimate away from the minimum site administrative costs, especially for the small site. A site by site estimate technique as was developed for the other alternatives needs to be done for this alternative to capture the similarities in the cost estimating methodologies. Thirdly, to exclude part of the costs of doing business (fencing) does not provide a complete cost picture. The referenced sources are not shown anywhere. For example, provide the cost basis for $1,000 for every survey event for sites smaller than 5,000 ft^2. The costs of site inspections do not capture the administration aspects of compiling and documenting the inspection. What is the basis for several of the cost estimate numbers, e.g., "Unit costs for vadose zone monitoring" being $75 per bore hole. Too many of such numbers are in the estimate and are not supported with actual cost information.
END		