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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Upper Columbia Fish and Wildlife Office
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August 22, 2008

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Dear Mr. Franco:

Attached are the U.S. Fish and Wildlife Service's (Service) comments to the document entitled, "Remedial Investigation Work Plan for Hanford Site Releases to the Columbia River," Document number DOE/RL-2008-11, Revised Draft A.

The Service appreciates the opportunity to work with the U.S. Department of Energy to properly evaluate and appropriately clean up the river and lands on the Hanford Site. We look forward to continued work on the Site.

Please feel free to contact Jim Hansen (509-893-8034) with any questions or comments.

Sincerely,

Supervisor

Enclosure

A-06

Comments prepared by the U.S. Fish and Wildlife Service, Upper Columbia Fish and Wildlife Office, Spokane, Washington.

August 22, 2008.

Comments:

Executive Summary

Note: Comments identified below for the Executive Summary that apply to similar text or the same figures and tables in the main text of the report are not re-addressed, but apply equally. This is to remove duplication of effort and redundancy.

1. Table ES-1. Release Mechanisms and migration- Should explain role of bed and bank sediments leaching and direct release (only soil mentioned), groundwater discharge to river, hydraulic cycling through sediments as river levels fluctuate rapidly.

2. Figure ES-3. In river systems, separation of groundwater and surface water is not clear. Water in pore spaces in bed sediment can be quite different from surface water, and benthic organisms and some fish (e.g., sculpin, larval sturgeon) can use these locations and be directly exposed to essentially groundwater. In gaining reaches (or specific groundwater upwelling sources), organisms can be directly exposed to essentially groundwater. This difficult problem is a primary focus in other investigations in the Columbia River. You should review the ECO Update / Issue Paper entitled "Evaluating Ground-Water / Surface- Water Transition Zones in Ecological Risk Assessments," found at http://www.epa.gov/oswer/riskassessment/ecoup/pdf/eco_update_08.pdf

3. Figure ES-3 seems overly simplistic. Groundwater essentially has dermal contact (dermal includes the gill), soil has incidental ingestion, there is the potential for internal radiation through inhalation and ingestion, and there are terrestrial biota in the aquatic food chain (e.g., grasshoppers, other insects).

4. Figures ES-6 and ES-7 are overly simplistic. EPA indicated groundwater discharges are found in some areas in deep zones of the river and on far bank areas. The reach would be highly unique to not have deeper contaminant sources from groundwater upwelling. Groundwater sources of contaminants and risk analysis for that source and pathway is important to economically and ecologically important species like salmon and sturgeon. Many other benthic-oriented species should also be considered like sculpin and mussels. Groundwater sources should be fully characterized to allow for proper risk analysis. Investigations should be focused on the groundwater-surface water interface, not at some distance above the sediment. This concern is paralleled at other investigations presently occurring in the Columbia River.

5. The separation of river corridor and near-shore investigations does not make sense ecologically. The reach can fluctuate up or down more than 10 feet over a few hours either up or down. All the submerged environments are connected and can be considered deep or shallow several times in one day. Arbitrarily selecting six feet below low water line is concerning.

6. Fish sampling exclusively for human health risk assessment ignores the ecological pathway for piscivorous birds, mammals and fish.

7. Table ES-4. The benchmarks should be presented and selection of specific benchmarks should be discussed. Certain species of mussel, sturgeon, and sculpin have recently been identified as extremely sensitive, potentially not protected by current water quality criteria. These species should be directly evaluated to existing toxicity data. Missing data (i.e., no literature values specific for PCOC or species) should automatically be considered a data gap for more detailed evaluation through toxicity tests, contaminant mode of action comparison, or other specific comparisons.

8. Table ES-6. The schedule is overly aggressive and will lead to poor designs, inadequate sampling, collection errors, etc. Missed or incorrect risk analysis could lead to re-evaluation through other means (e.g., NRDA evaluations), which could lead to additional risk analysis and characterization, and potentially to additional remedial actions. These problems have been found on other sites – example: the Coeur d'Alene remedial action was greatly influenced (greatly expanded) after NRDA activities characterized the extent and magnitude of problems.

Work Plan Text

9. Section 3.1. What about internal radiation from ingestion or inhalation?

10. Section 3.3. Both fish and benthic invertebrates are potentially exposed to sediment and to ground water as pore water. See recent EPA citation above. Other similar actions to the Hanford Cleanup have recognized that benthic communities (e.g., benthic macroinvertebrates, sculpin, larval sturgeon, mussels, larval lamprey) are exposed to water that is not similar to surface water, but more similar to groundwater. Specific studies in many areas of the river are needed to specifically examine this. USGS researchers and others have developed methods to examine this porewater and near-sediment water. Upwellings may have concentrations very close to groundwater concentrations, and some may be contaminated with wastes specific to Hanford operations.

11. Same section. What about piscivorous and predatory avian species (e.g., osprey, eagles, herons, pelicans), songbirds, migratory waterfowl, omnivorous mammals (e.g., raccoon), and herbivorous mammals (e.g., deer). Sediment and contaminated diet have been shown to expose these organisms to harmful

contaminants. At other locations, risk has been identified to these groups, often specifically related to incidental soil and sediment ingestion, which can be relatively high.

12. Section 4.3.1. A better understanding of data would be presented graphically in a map. Although a large number of samples is apparent, the potential area of risk is also large.

13. Section 4.3.3.3. Possible benchmarks for use in analyzing risk should be presented and evaluated, and the decision process for use of specific benchmarks should be transparent. Those benchmarks should be compared to detection limits and data quality objectives to determine appropriateness and data gaps. If this information is presented elsewhere, a clear path to that evaluation should be presented.

14. Same section. Second bullet. Analytes that were not analyzed for in the verification data set were evaluated for process relevance, and following bullet section is confusing and potentially problematic. The exclusion process should be transparent. First bullet in second section indicating possible exclusion based on incidental quantities or dilute concentrations is only relevant based on toxicity and release pathway. Chemicals that degrade rapidly should be evaluated for degradation compounds or for processes that may affect degradation. Chemicals used for unique applications that were not part of the Hanford Site Processes may have been used on the facility for other purposes. Pesticide and herbicides that are detected but not relevant to the Hanford Site should be identified and explained to show that they are not relevant.

15. Table 4-1. Common pesticides and other organics seem to be missing such as DDT and DDT metabolites. Use of these pesticides was common, particularly on military facilities.

16. Section 4.3.6. Identification of fine-grain sediments is appropriate, but decades of deposition may have covered highly contaminated sediment with layers of cleaner sediment. Methodology to avoid large dilution of potential high contamination layers should be identified. Also, sieving methodology to ensure fine-grain sediment should be identified. Changes in river morphology and hydrology over the past decades should be evaluated to determine if depositional areas have changed, potentially leaving contaminated sediment unsampled in the current design.

17. Section 4.3.7. Consideration of sampling and analysis costs. Arsenic is a potentially bad example, but apparently the calculations were made for each potential COC. That information should be more transparent by presenting the decision data in a table. The basis for determining "background" concentrations in the decision process should also be much more transparent by presenting a section on this background to document that the decision to not sample arsenic or others

at higher levels is appropriate. Again, the analysis was apparently done, so show it. Otherwise, it appears to be an arbitrary decision based on some level of judgment or theory.

18. Section 4.3.8.1. The fine-grain sediment survey is important, but a morphological and hydrological model to show deposition areas based on bathymetry and flow should be available, and is highly appropriate. Visual surveys will miss important deep water depositional areas.

19. Section 4.3.8.2. Methodology for groundwater plume upwelling survey is highly important and may require specialized methods and equipment, and may be affected seasonally, or even daily, depending on river and groundwater flows. One evaluation may not be appropriate.

20. Section 4.3.8.3 Habitat and receptor surveys will also be affected seasonally, and receptor use of habitats may require specialized methods, particularly for benthic fish. Short-duration visual surveys for receptor use of habitats is inappropriate. Surveys conducted by the FWS for waterfowl include 10-14 week surveys where observers go to standard points for observation one day each week. Some surveys have required remote digital photography or trapping.

21. Section 4.3.9. When, where, and how to collect data may be different for some samples. For example, Sturgeon habitat use differs seasonally as well as daily. Defining exposure of these fish will require specific studies of movement and habitat use by several age classes to determine potential exposure.

22. Section 4.3.9.4. Beta values of 10-15% will be used..., except where determined to be too costly or unnecessary (from previous section). Again, this should be documented clearly where exceptions were made, specifically for each PCOC affected.

23. Tables 4.5 and 4.6 seem to assume that sources of variability of samples were captured by historic sampling efforts. Where variability in sediment and water have not captured variability associated with groundwater upwelling or specific depositional sites (like deep water), these assumptions may not hold. Appropriate number of samples may change on re-analysis based on more sophisticated and appropriate sampling methodology. Groundwater-surface water interface samples and surface waters and sediment otherwise affected by groundwater don't seem to apply. Previous samples may not be appropriate for evaluating appropriate numbers of samples for these conditions.

24. Table 4-7. Number of samples analyzed would be helpful. Also, locations where samples were collected should be at least discussed to show that representative deep, shallow, and transitional habitats (pool-glide transitions, thalwag areas of glides) were sampled.

25. Figure 4-5 and similar. The combined data sets are somewhat informative, but not transparent. Specific compounds or elements are more relevant, and could be presented in a table.

26. Section 4.5.4.2. Analyzing liver separately from other organs may be informative to exposure and potential ecological effects.

27. Section 4.5.4.5. Results of calculated whole-fish concentrations may be informative to ecological risk analysis for piscivorous receptors.

28. Section 4.6.3.1.2. Standard water quality parameters, although not COCs, are helpful in evaluating metal toxicity and for comparison to current criteria and therefore should be measured. Some could be measured in a subset, such as DOC in surface water.

29. Same section. A proper background evaluation and determination is appropriate before screening out any potential background radionuclides.

30. Same section. Some essential nutrients (e.g., copper, zinc, nickel) are essential in small quantities, but toxic at elevated concentrations. All essential nutrients with potential relevant toxicity should be evaluated.

31. Section 4.6.3.2. Recent evaluations in mussel, sturgeon, and sculpin sensitivity have shown that water quality criteria and benchmarks may not be protective of these species. Several data gaps in toxic sensitivity are relevant and potentially important to evaluating the Hanford Site. Evaluations should be made with this in mind.

32. Section 4.6.3.6. Consideration of sturgeon and mussel tests are appropriate.

Appendix A.

33. Appendix A, Table 2-2. Fish sampling is unclear if species-specific sampling will be used, and how many fish samples per species. Each species will accumulate contaminants differently, and should be analyzed independently. Also, Cr+6 should be analyzed in this section for comparison to downstream locations.

34. Appendix A: 2.2.3. Habitat Receptor surveys. How will a "visual review" be conducted to "verify the presence of key receptor species" and what are the key species? It is not possible to "visually survey for benthic invertebrates, mammals, etc. Additionally, the timing of the surveys can also identify only a sub-set of biota (birds) using an area.

35. Appendix A. Section 2.4. Why are fish not being tested for Cr+6?

36. Appendix A, Tables. Sampling plan does not appear to address groundwater (plume) – surface water interface that is biologically active, particularly with respect to benthic macroinvertebrates (including mussels), benthic fish (including larval sturgeon). Much closer than one foot above sediment is needed.

37. Appendix A. Figures showing sampling areas. Some species may have high site fidelity or territories that are associated with near-shore or underwater structure features. Some fish have diel movements that may not be represented in current design. Current design may be too limiting for effective capture. It is unclear why fish sampling is so restricted in certain areas, and potential plume areas are not specifically sampled. Other sampling areas seem to be in potential plume areas or in highly varied habitats to allow for adaptive sampling. Rationale should be more transparent.

DQO Summary report

38. Comments identified above with relevant similar sections in the DQO Summary Report should also be considered.

39. All tables. Laboratory detection limit requirements are problematic for many compounds or elements where benchmarks are below detection limits. Laboratories should be able to produce detection limits much lower than those requirements. See the organic and inorganic statements of work found on the U.S. Fish and Wildlife Service's Analytical Control Facility web site:

    http://www.fws.gov/chemistry/index.htm

    These statements of work identify contract-required detection limits. Most labs in the program are capable of producing method detection limits much lower than those contract-required detection limits using EPA standard methods, and they have been able to modify those methods to provide lower detection limits under special request.