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Coordinator

December 28, 2011

Mr. Jonathan A. Dowell
Assistant Manager for the River Corridor
U.S. Department of Energy
Richland Operations Office
P.O. Box 550
Richland, WA 99352



RE: *Hanford Natural Resource Trustee Council Comments on the Draft A, Remedial Investigation/Feasibility Study for the 100-KR-1, 100-KR-2, and 100-KR-4 Operable Units (DOE/RL-2010-97) and Draft A, Proposed Plan for Remediation of 100-KR-1, 100-KR-2, and 100-KR-4 Operable Units (DOE/RL-2011-82)*

Dear Mr. Dowell:

On behalf of the Hanford Natural Resource Trustee Council (HNRTC), we appreciate the opportunity to provide early comments on the subject documents. The Remedial Investigation/Feasibility Study (RI/FS) has been based, in part, on the following: River Corridor Baseline Risk Assessment (RCBRA), Volume 1: Ecological Risk Assessment (DOE-RL-2007-21) and the Columbia River Component Screening-Level Ecological Risk Assessment (DOE-RL-2010-117). Our comments also reflect an initial reading of those documents as they influence the RI/FS.

This review of the RI/FS and Proposed Plan (PP) is neither detailed nor definitive, but rather intended to call attention to issues specific to the statutory responsibilities of the HNRTC. To the extent that we raise specific issues related to risk assessments, they are intended as examples, not to provide thorough technical review of those reports. We hope that our initial comments will result in a dialogue with DOE to effectively incorporate Natural Resource Damage Assessment (NRDA) liabilities into Hanford remedial action decisions, and be responsive to the guiding principles recently adopted by the HNRTC and transmitted to DOE. The RI/FS and PP for the 100-K decision unit will presumably serve as a template for final cleanup decisions in the entire river corridor, so we would like to discuss and resolve concerns prior to issuance of RI/FS and PP documents for other decision units.

In general, Council concerns include:

- Adequacy of the Risk Assessments and their ability to inform the Feasibility Study and Proposed Plan
- Conclusions of the Ecological Risk Assessment summary in Section 7 of the RI/FS
- Soundness of the assumptions and conclusions in the PP
- Implications of the proposed plan in terms of lost services, residual waste left in place, residual injury to natural resources, and costly future liability

Risk Assessments

Hanford trustees have a statutory responsibility to determine whether releases of hazardous substances have impacted natural resources, to quantify those effects, and to restore injured resources and lost services. This responsibility applies to the Site in its entirety, and requires a comprehensive, scientific approach.

Adequacy of Data

Individual trustees have participated in numerous river corridor baseline risk assessment workshops and commented on draft reports. Concerns have included basic environmental design issues such as:

- Small sample sizes, which lead to very limited statistical analyses
- Sampling arrays based on opportunistic sampling that does not accurately characterize the environment or support statistical analyses of an unbiased (random) data set
- Arbitrary and inconsistent inclusion/exclusion of data in analyses
- Inappropriately high detection limits
- Inappropriate data analysis methods, e.g., pooled analysis of spatially heterogeneous contaminants, thereby obscuring risk associated with localized releases and hot spots
- Compromised samples through chain-of-custody issues

While some changes were made to the ecological risk assessment planning documents as a result of Trustee comments, some lingering concerns are now manifested in draft risk assessment documents that we believe do not meet scientific scrutiny. At best, many conclusions are false-negatives; at worst they are wrong and substantively misleading.

Reference Sites

The representativeness of selected reference sites has been frequently challenged by individual trustees. As examples; (1) the river at Vernita, above the 100 areas, had high concentrations of hexavalent chromium (see RCBRA Appendix B, Figure B-18); (2) upstream of the 300 area, sites received high concentration of contaminants from the upstream 100 areas and from 200 Area groundwater; (3) the Columbia River Component Risk Assessment (CRC) uses reference samples from polluted waters including wasteways and irrigation returns.

Spatial Coverage of Data

Only operational areas were considered, yet *“non-operational areas include large portions of the River Corridor...[but] are not anticipated to be adversely affected by Hanford Site releases.”* Few representative data are offered to substantiate this assumption. The Executive Summary of the RCBRA states, *“The RI/FS reports will further evaluate non-operational areas...”* but no

quantitative evaluation has been provided for these areas at 100-K. There is a paucity of data and evaluation for the 100-K area as a whole. Consideration of transport of contaminants to other areas was lacking, particularly for hexavalent chromium.

Benchmarks

Definition of benchmarks was not based on data from newer studies or studies that use molecular methods [See WAC 173-340-702 (15)]. For example, use of the Washington State Water Quality Criteria of 10 µg/l as an Aquatic Community Water Benchmark for hexavalent chromium (Cr⁶⁺). Recent literature shows significant avoidance to Cr⁶⁺ by rainbow trout occurs at 3 µg/l with an estimated avoidance threshold of 1.7 µg/l. In the CRC, water quality criteria (e.g., drinking water standards for chemicals and radionuclides) were often ignored in identification and evaluation of potential contaminants.

Remedial Investigation/Feasibility Study

Careful review by technical experts suggests that much of the data, assumptions, analyses and conclusions presented in the RI/FS are of questionable quality and/or validity. Any information used by the trustees to develop components of the NRDA; such as the Preliminary Estimate of Damages (PED) (40 CFR 11.38) or Injury Assessment (40 CFR 11.62); must stand up to rigorous scrutiny.

There are numerous examples of incongruity between the RCBRA and the RI/FS. One example is the descriptions of uncertainties for aquatic endpoints in the RCBRA.

Overall the descriptions of habitat, representative target species and species of concern, exposure models (e.g. food web diagram), are either too generic to the 100 Area as a whole, which is misleading, or inaccurate; e.g., inclusion of grasshopper mice, vesper sparrow or robins as target species in models.

As described in the text, models used in this document are not based on Hanford conditions or data; results can either be “*overconservative or underconservative*,” such that model outputs do not inform cleanup decisions. Examples from Chapter 7 are “*the suitability of these models to conditions at Hanford [is] unknown*” and “*...no life history data specific to the Hanford Site were available.*” Given the history of annual field work conducted by PNNL and subsequent publications, these statements are not supported.

As noted above, data are extremely limited for modeling in non-operational areas, and the unambiguously stated conclusions are questionable.

Specific Comments

- In Chapter 7, “*...the 100 Area is predominately developed and use of the area by wildlife is expected to be minimal.*” This assumption is wholly unsupported by existing data or the experience of seasoned field biologists familiar with the area. Further, it negates restoration and denies potential benefits derived from future site restoration.
- It appears that even within the operational area, only 16 waste sites have been identified, which again begs the question of adequate characterization to inform the 100-K Ecological Risk Assessment.
- Exposure and risk for many contaminants is poorly characterized or completely unknown. Data from only four samples in the near shore areas along the K-Area

shoreline were used for risk analysis. Many contaminants have detection limits higher than action levels. Again, conclusions in the 100-K Ecological Risk Assessment are weakened.

Proposed Plan

Selection of the preferred remedy

We do not understand the choice of preferred alternatives (Alternative 2) for remedial actions at 100-K. Alternative 2 is asserted to be more implementable, despite reliance on several unproven technologies acknowledged in the PP as requiring bench testing. In contrast, Alternative 3 uses proven technologies already in use at Hanford. Selection of alternative 3 appears to result in less natural resource injury (and service loss) than Alternative 2, as the remedy is more complete and would be accomplished more quickly than Alternative 2 (Figures 16, 18). We recommend DOE re-evaluate remedy selection and to include NRDA issues in that evaluation.

Implications of the preferred remedy

There is no acknowledgement in the PP of the NRDA implications of remedy selection. Cleanup decisions explicitly affect natural resource injury – amount and nature of waste left in place, nature and duration of institutional controls, and extent of service losses associated with institutional controls. We believe it is timely for DOE to work with the Trustees to incorporate those implications and costs into evaluation and selection of alternate remedies. Our goal is an alternative that minimizes life cycle costs and also minimizes or eliminates residual injury to natural resources. The Preliminary Estimate of Damages (PED) for the Hanford Site, currently being prepared for the HNRTC, could provide DOE and the trustees with cost information that can be used as an initial basis in analyzing various alternate remedies

Lost Services

An integral component of the NRDA is to determine the services lost from injured resources due to past releases prior to remediation, and future exposures to residual contamination. Because the exposure scenarios developed in the RI/FS and PP does not include several potential exposure pathways, they do not inform either response actions or NRDA regarding:

- Tribal harvesting of treaty reserved resources
- Tribal religious practices
- Well-drilling, irrigation, children or a garden plot for the “resident ranger”
- Unrestricted use of orchard lands

Management of orchard lands

The brief section on Orchard Lands is inadequate because it does not:

- Provide a complete description of nature and extent of contamination
- Summarize existing and future risks to biota
- Address remediation, other than refer to a waste site boundary, which is inconsistent with the objective of final RODs, and likely ensures residual contamination, injury and liability.

The HNRTC appreciates DOE staff taking the time to make presentations on the 100-K RI/FS and Proposed Plan at our October meeting. We hope our comments are helpful and lead to a more cost-effective and efficient cleanup at 100-K and at other river corridor decision units. We invite you to meet with us again in the near future to discuss the concerns and comments presented in this letter to integrate NRDA into the cleanup process. Please feel free to contact me with questions. We look forward to working with DOE on this and future work in the river corridor.

Sincerely,

A handwritten signature in black ink, appearing to read "Jack Bell". The signature is fluid and cursive, with the first name "Jack" and last name "Bell" clearly distinguishable.

Jack Bell
Chair, HNRTC

Cc: Dennis Faulk, U.S. Environmental Protection Agency
Jane Hedges, Washington Department of Ecology
Susan Leckband, Hanford Advisory Board
HNRTC Senior Trustees