



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 HANFORD/INL PROJECT OFFICE
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April 30, 2008

Briant L. Charboneau
Richland Operations Office
U.S. Department of Energy
PO Box 550, A6-33
Richland, Washington 99352

Re: Comments on the Central Plateau Terrestrial Ecological Risk Assessment Report

Dear Mr. Charboneau:

The U.S. Environmental Protection Agency (EPA) appreciates the opportunity to review and comment on the Central Plateau Terrestrial Ecological Risk Assessment Report (DOE/RL-2007-50, Draft A Reissue). The comments in this letter and in the enclosure are provided after utilizing a portion of the 30-day extension that the Washington Department of Ecology (Ecology) is taking to review the report. This extra time was necessary to compile comments from our headquarters and also our contractor, the U.S. Geological Survey.

The major comments on the report are provided below:

1. Consistent with our opening comments at the April 9, 2008 workshop on the report, EPA advises DOE not to overreach when drawing conclusions about ecological risk in Hanford's central plateau (includes the 200 Area National Priorities List site). We remind DOE that the initial goal for the scope of the ecological risk assessment was to focus on waste sites where ecological risk might make the difference in remedy selection. It was not aimed at the sites where human health risk is a known driver for a response action. Some of these sites with human-health risk drivers also have shallow contamination that may pose ecological risk. This risk will have to be estimated under the Remedial Investigation/Feasibility Study (RI/FS) for individual operable units.
2. Waste site characterization information from the operable unit investigations must be used to complete the RI/FS process for individual operable units. This can be done, where applicable, by comparing waste site contaminant information from the shallow zone (upper 15 feet) with the results of the central plateau ecological risk assessment findings. Due to the need to utilize data from waste sites in individual operable units, the scope of the central plateau ecological risk assessment does not include the completion of the ecological risk assessment portion of the RI/FS process for individual operable units. The exception might be where DOE can make a strong case that a particular waste site investigated in this risk assessment is representative of some waste sites in operable units. This representative-analogous relationship would have to be confirmed through

investigation at the sites.

3. We agree with DOE that site-specific comparisons of soil and mouse tissue samples from the BC Control Area highlight the conservatism of the uptake assumptions in the Biological Concentration Guide when applied to this waste site. However, before cleanup levels are developed for 200 Area operable units based on such comparisons, further corroboration of these much lower uptake factors needs to be performed and uncertainties understood.
4. The report is written more like a scientific paper than a tool to communicate ecological risks to stakeholders and the public. This makes it hard to read and to follow the risk assessment process. Please see comments from Mark Sprenger of EPA headquarters (Edison, NJ laboratory) in the enclosure to better understand this point.
5. The results of the risk assessment must be viewed in light of the intensive management of many central plateau waste sites, including several of the sites studied. Uptake would no doubt be greater if deep-rooted plants were allowed to grow unchecked. Russian thistle (tumbleweeds) have been radiologically surveyed and gathered for disposal for many years. Occurrence reporting regularly cites beta/gamma detection values for these plants into the millions of disintegrations per minute. Clearly, ongoing uptake of site contaminants is occurring at some locations.

Another waste site management activity is the control of insect and animal burrowing into waste sites. The report does briefly discuss ant spoils and their radiological aspects. There needs to be a better examination in the report on why these transient, or nuisance, exposures are not significant for the food web and the greater ecology of the central plateau. A similar discussion about the exclusion of contaminated buildings and facilities from the risk assessment needs to be included.

6. As was pointed out at the workshop, there are many uncertainties inherent with the sampling designs that must be explained. Without these uncertainties prominently described, the reader might fail to put the results into the proper context. Please see comments from Patrick Moran of the U.S. Geological Survey on this subject in the enclosure.
7. Text entries in the report and its appendices need to be consistent with regard to the two reference sites selected for this risk assessment that are far removed from the Hanford site. EPA believes those reference sites are valuable and necessary considering the potential for airborne contamination from stack releases at reference sites on the Hanford site. Sections of the appendices describing earlier resistance and rationale for not having such sites needs to be prefaced by updated language that is consistent with later sections describing the two sites and the factors that were considered in their selection.
8. EPA would like to understand the source of the 0.91 ppmv (parts per million by volume) carbon tetrachloride ecological screening level value for inhalation by small burrowing mammals. At the workshop, Neptune and Associates seemed to indicate that they developed this value as a benchmark.

9. Finally, we appreciate that DOE and their contractor caught the data entry errors and provided a redline strikeout packet to EPA, Ecology, the Tribes and the State of Oregon. However, we received this rather voluminous packet on April 10, 2008, and this complicated our ability to review the document. This is especially true for our headquarters and U.S. Geological Survey reviewers who did not receive these materials. As DOE incorporates these changes into the revision of the document, it needs to assure that the new material makes sense and is correct. Some of the added sentences do not make sense and are not consistent with the existing text.

This concludes our major comments on the report. If you have questions, contact me at (509) 376-8665.

Sincerely,



Craig Cameron
Project Manager

Enclosure

cc: John Price, Ecology
Larry Goldstein, Ecology
Bryan Foley, DOE
Stuart Harris, CTUIR
Gabriel Bohnee, Nez Perce
Russell Jim, Yakama Nation
Ken Niles, Oregon Dept. of Energy
Susan Leckband, Hanford Advisory Board
✓ Administrative Record: Central Plateau Ecological Risk Assessment

Supplemental U.S. Environmental Protection Agency (EPA) Comments on the
Central Plateau Terrestrial Ecological Risk Assessment Report
(DOE/RL-2007-50, Draft A Reissue)

Enclosure to comment letter from Cameron to Charboneau, dated April 30, 2008.

The following are comments from Mark Sprenger, EPA Headquarters:

General comments

I recognize that the history and process of investigations at the Hanford Site are long and involved. This makes evaluations of individual reports difficult. However, it is critically important that documents such as the risk assessments present information and conclusions in a clear and understandable manner. The communication value of risk assessments is to present information and conclusions not only to the risk managers, but also the Site stakeholders. Risk assessments are not only technical documents but communication tools. As a communication tool this document fails. While the document claims to follow existing guidance for ecological risk assessments, the presentation of the risk assessment does not clearly do so. Much of the document appears to follow a pattern of collected data being put into statistical programs, the resulting output is discussed at length often being a discussion as to why the conclusions of the output are not real but a function of data inputs (such as detection limits). The risk assessment is lost within this process.

I am inclined to concur with the conclusions that there is not current ecological risk in the areas discussed in this report. However, I am not confident in this conclusion. After repeated efforts to look at the data used in the ERA (tissue concentrations, soil concentration); I am not confident that I know what those levels are. This is not to say the data is not in the report, but where presented it is difficult to evaluate because of the presentation in numerous charts or plots.

If the possibility exists for revisions, I would suggest that the existing document be augmented with a summary of the raw data and summary statistics; a summary of the assessment endpoints and their associated measures of effect (with a summary of why these measures of effect are relevant to the individual Contaminants of Potential Ecological Concern [COPECs] and the assessment endpoints). There should also be clear statements of what the risk questions are relative to the COPECs and the assessment endpoints. There needs to be a clear statement as to what is the "problem" at each of the areas. Also, there needs to be a clear summation of the toxicity reference values for each assessment endpoint. Within the risk characterization the reader should be able to follow the calculation of the Hazard Quotient (HQ) values, not only presented the HQ itself.

The objective is to "allow the reader to come to the conclusion which the document concludes." This document does not do this.

Executive Summary

Page ix

Explain why they consider the field measures of relative abundance, diversity, and gender ratios and reproductive status to be measures of ecosystem/receptor characteristics.

Page x

It also appears to state that “causality” relationships carry less weight within the risk characterization. This may be a misreading of the intent of the statement; however, the statements should be clarified.

Page 2-16

Why is risk question, “Q4: Do COPECs in shallow-zone soils and food decrease insectivorous reptile abundance or biomass, or affect size structure?” phrased the way it is when all of the other risk questions include growth and reproduction? I did not see an explanation.

The largest issue is that there is not a clear and concise presentation of the assessment endpoints and the mechanisms of toxicity for the identified COPECs to the assessment endpoints. The mechanisms for adverse effects should link to the assessment endpoints through the risk questions. For example, total ionizing radiation may be expected to increase mortality if a dose limit is exceeded through general tissue damage. The risk question would be, “do total ionizing radiation levels exceed this threshold?” The measure of effect would then be the total ionizing radiation dose calculations compared to the benchmark. The elements of this seem to be present, but the presentation makes it very difficult to line up components of the risk assessment.

Section 1

There are apparently SAPs which were prepared and approved for the data collection, but I’m not sure what the actual data generated was.

Multi-increment sampling was used in the design for the extent of contamination. There should be a linkage somehow to release points and or source areas. This should be an explanation of how they believe that will not omit a highly contaminated area by diluting it out by sampling. If this was used in confirmation sampling (residual), that should be stated.

Section 2

Each of the sections should include a short statement on the source of contamination and the COPECs. While it exists within the document, it is not clearly evident within each section.

Appendix C

What is the purpose of the statistical testing? There is a large amount of work done here, but little presented to say why that work was done.

There is a large amount of work done within this document on radiation and individual isotopes, but little presented as to why this is necessary, is it all to support the radiation exposure model? Cancer risk is not a typical driver for ecological risk because the life span of the organisms is such that the adverse effect is not important. Chemical risk of radioactive materials is typically the risk driver. If this work was done to support fate and transport, then it should be presented elsewhere.

Section C4.2.1 discusses an apparent impact to the small mammal population from polychlorinated biphenyls (PCBs), and then claims that the statistically significant effect is driven by non-detects in the data set. However, no data is presented on the actual concentrations. It appears that this is an example of where data was collected, placed into statistical programs and then the evaluation became an explanation of the statistical tests. The risk evaluation is lost.

Section C4.2.3 Discusses Pb (lead) in the context of mammal exposure only, but it is unclear if Pb was retained as a COPEC for only mammalian assessment endpoints. The section goes on to state that basically Pb concentrations in the area under evaluation are below the Site background and below Lowest Observable Adverse Effects Level values. It then goes on to discuss how apparent calculations indicating adverse reproductive effects are not really there.

The following are comments from Patrick Moran, U.S. Geological Survey:

Major Comment

1) The conditions under which this risk assessment is being conducted, i.e. after preliminary or early actions, but before a more permanent decision and remedy has been reached, is a subtle, yet very important consideration not adequately embraced throughout the document. Many of the habitat types under consideration in this Ecological Risk Assessment (ERA) have been and/or currently are under some active management regime- ranging from routine surveillance to herbicide application to intermittent earth removal and disposal. As the focus of this ERA takes these conditions as a given and proceeds to assess risk "under the current management regime", so too must the bulk of the conclusions of such an assessment be limited in interpretation to "under the current management routine." This needs to be stated clearly and early; perhaps in the Executive Summary. While this active management is mentioned in a few places in the document, the significance of this point warrants further consideration in both the data analysis and discussion and conclusion sections.

For example, interpretation of Figure C4-3 is difficult when it is not clear whether the groups being compared are under equal management regimes? Are any reference sites also actively managed sites? If not, should actively managed sites be compared to reference sites? Is this the case in C4-3? One interpretation of this figure is that indeed plant diversity and richness is lower at waste sites. Without the additional explanation that management activities on these sites might direct this outcome, which currently does not appear until the conclusion, this apparent "effect" appears to be overlooked. This seems to beg the question; doesn't data analysis of waste to reference sites need to take place within separate groups of managed vs. non-managed areas?

Likewise, some environmental characterization summary and discussion of the habitats under consideration, and their current management regime, is needed in the introduction of the main body of the document. An example question to guide discussion might be: What general habitat types exist on site?

2) The uncertainty discussions, as currently presented, are inadequate. The discussion needs to more fully address data gaps and uncertainty in the present data. For example, wasn't a seed germination test originally attempted in this risk assessment? What evidence do we have explicitly regarding germination inhibition- especially considering it is an expected effect from several metals; as indicated in C5-3? Furthermore, conclusions need to be drawn regarding the sources and relative magnitude of the uncertainties presented in each of the tables. These uncertainties, both as data gaps and uncertainties in the data, i.e. limited sample size, needs to be more fully woven into Section 5 and the overall conclusions.

3) Given the numerous caveats brought up in this risk assessment process, i.e. examining actively managed sites, disconnected geographic areas and removal of the highly contaminated sub-units such as the tank farms, a specific "Scope of Inference" section seems warranted. To what, where, and how far should the findings of this risk assessment be extended in the decision making process? Simple measures such as, square meters included versus square meters sampled, and where randomizations were used and where they were not could be included here. Perhaps a map clearly indicating the special area over which the conclusions of this assessment are considered relevant.

Minor Comments

Figure C-1 needs more explanation, in particular, units on the x-axis.

Some discussion, and presentation of relevant data, needs to be presented to address exposure and risk to larger herbivores such as deer and/or elk.

Growth as an assessment endpoint is referred to in numerous places throughout the document. However, it is not clear to this reviewer that "growth" was ever measured. Strictly speaking, growth is the change in physical size of an individual or population over time. Were repeated measures of any endpoint ever made over fixed periods of time to assess change per unit time? Perhaps terms such as "density" or "relative abundance" are more appropriate here.

Likewise, the term "reproduction" in ecology has very specific meaning and refers to the "production of a new, and physiologically independent, entity." Was such an endpoint measured in this study? For example, some work in Hanford's River Corridor Baseline Risk Assessment looked at King Bird nests and eggs per nest. Were any such direct measures of reproduction taken here? If not, consider deleting or rephrasing as an assessment endpoint.

Additional EPA Comments

At the April 9, 2008 workshop, Ecology mentioned discoloration of vegetation in the hottest zone of the BC Control Area (Zone A). EPA would like to learn more about this and if this might be related to an effect

During a tour of the Hanford site on April 21, 2008, EPA spotted a small herd of elk just downhill and north of the 200 West Area. This supports the comment by Moran (above) that some discussion needs to address potential exposure to large herbivores.

Figure B4-10 looks exactly like the Figure B4-11 and the same for B4-12 and B4-13. Is this correct or was there an oversight?

Some of the figures in Appendix C could use more explanation. For example, figures C2-43 and C2-57 have two colors of data plotted without any explanation of what the colors mean.