



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

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

**Re: Comments on the Deep Vadose Zone Treatability Test Plan for
the Hanford Central Plateau**

Dear Mr. Charboneau:

The U.S. Environmental Protection Agency (EPA) has reviewed the Deep Vadose Zone Treatability Test Plan for the Hanford Central Plateau (DOE/RL-2007-56, Revision 0). EPA's comments are provided below:

1. The test plan is better than the version first submitted by the U.S. Department of Energy (DOE). However, it is still a "plan for a plan." This does not meet the expectations that EPA and the Washington Department of Ecology (Ecology) have for the test plan. DOE has not made the kind of progress we had hoped for, especially when one considers that EPA and Ecology wrote the joint letter about the need to focus on deep vadose zone contamination back in December 2004.

The milestones and schedule for technetium-99 studies planned for the 200 BC Cribs and Trenches area appear to be too late to provide meaningful input to the 200-BC-1 feasibility study and proposed plan. We expect DOE to meet the M-015-51 milestone date by providing a feasibility study and a proposed plan that factor in treatability test results. In comments provided on an earlier draft of the test plan and in discussions at a January 24, 2008, meeting on the detailed sections of the test plan, EPA stressed the importance of getting out in the field in time to support the 200-BC-1 schedule. The schedule provided in the test plan does the opposite. It moves the technetium-99 field test out beyond what was proposed in the first draft of the test plan. This is inconsistent with our expectations and fails to support achieving M-015-51.

2. EPA had the U.S. Geologic Survey (USGS) review the more specific sections focused on the first technetium and uranium studies to be conducted. Their comments are enclosed. We plan to have USGS review the field sampling plans once they have been developed by DOE.

3. The test plan states that thorough characterization (using traditional sampling and analysis) of the vadose zone in the 200 Area is "cost-prohibitive." The joint EPA-Ecology letter from 2004 not only mentioned the need for remediation technologies, but also for better characterization. We remind DOE of its statutory obligation to define the nature and extent of contamination. Early findings from the use of electrical resistivity to characterize vadose zone plumes have not proven the technology can be used to replace some of the necessary physical sampling and there are questions about its utility for other purposes. For some waste sites the data quality objectives process led to an iterative characterization approach. A placeholder has been maintained for these sites where electrical resistivity information is assessed and the need for additional borehole or other characterization is determined. If the early findings on electrical resistivity correlation from the BC Cribs and Trenches and south PUREX areas hold true, some of these waste sites will need more borehole drilling and sample collection and analysis.
4. EPA believes that one of the reasons that DOE has not progressed as far as it should have on addressing the deep vadose zone challenge is the lack of technology needs identification and funding. If the Site Technology Coordination Group and its subgroups had remained active, DOE might be further along. We suggest that the Integrated Project Team (IPT) work groups are the logical bodies to identify and promote technology needs for consideration and funding. These work groups cover many crosscutting programs where technology development and implementation complement their integration function. We urge DOE to fully support IPT work group efforts.
5. EPA has attempted to work with DOE to develop a more comprehensive and aggressive test plan. We will continue to support improvement and push for meaningful testing. We advise DOE to fund this effort and not postpone it. We expect an adequate and timely submission of the feasibility study and proposed plan for the 200-BC-1 operable unit to meet the M-015-51 milestone. To be adequate, these deliverables must include a preferred alternative that is protective of human health and the environment. This protectiveness must account for all of the contaminants and risks they pose including the deep technetium-99 contamination.

If you have questions, contact Craig Cameron at (509) 376-8665.

Sincerely,



Nicholas Ceto
Program Manager

Enclosure

cc: John Price, Ecology
Dibikar Goswami, Ecology
Stuart Harris, CTUIR
Gabriel Bohnee, Nez Perce

Russell Jim, Yakama Nation
Ken Niles, Oregon Dept. of Energy
Susan Leckband, Hanford Advisory Board
Administrative Record: 200 Area Site-wide

USGS comments about "Appendix D Treatability Test Plan for Soil Desiccation" in DOE-RL-2007-56 Rev 0

William Herkelrath, Menlo Park, CA and Rick Dinicola, Tacoma, WA

The plan did include a better description of the general thinking behind soil desiccation, although most of that description (pages D-3 thru D-3) was reiterated from the vadose zone technical panel report. The new information presented concerned the bench-scale treatability tests and the modeling efforts to help design the field test.

Key elements of the bench-scale treatability testing are described in the bulleted list on page D-11. It was good to see that methods for desiccation monitoring will be evaluated. Although these flow cell experiments will be useful, it will be challenging to pack a flow cell in a way that realistically mimics the multi-scale variability that likely exists in the deep vadose zone. Many relevant lab experiments have already been published in the literature. How will the new experiments build upon previously published work?

New information concerning the modeling efforts are described in the bulleted list on page D-12. It sounds like the modeling details that may address the previous USGS comments on the Draft 1-30-08 Test Plan will be submitted for technical review in a future simulation plan. Prior to doing additional simulations, does STOMP work properly in the very dry, nonisothermal regime anticipated in the lab experiments? If not, will STOMP be appropriately modified? Have the results from the many relevant lab experiments previously published in the literature been compared to STOMP?

Overall, the plan describes how comments about the previous draft plan will be addressed through bench-scale tests and modeling. No new information of the actual field test was presented. It seems that DOE is not confident in moving forward with a field test until more bench-testing and modeling is completed. That is somewhat understandable given the uncertainty involved in this remediation approach. However, the primary uncertainty in the effectiveness of soil desiccation may very well be how effectively the hot, dry air can be spread throughout the treatment zone. Preferential flow of air will likely be the rule rather than the exception. Thus, the bench-scale work and modeling will only go so far towards effective deployment of the technology. The actual field test remains crucial.

Finally, serious consideration should be given to the Sisson and Lu site for a "cold" field test due to the (presumably) dense monitoring well network at the site, or the relative ease and lower cost of enhancing the existing network. A key element of the field test will be monitoring the results; a greatly expanded monitoring network at the BC cribs may be very difficult and costly.

If you have any questions about the comments, please contact me by phone (253) 552-1603, 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.