



U.S. Department of Energy  
Hanford Site

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Ms. Susan L. Leckband, Chair  
Hanford Advisory Board  
Enviroissues Hanford Project Office  
713 Jadwin, Suite 4  
Richland, Washington 99352

Dear Ms. Leckband:

HANFORD ADVISORY BOARD (HAB) SEPTEMBER 4, 2009, ADVICE #221, "FISCAL YEAR (FY) 2011 HANFORD CLEAN-UP BUDGETS AND PRIORITIES"

Thank you for the subject HAB advice letter dated September 4, 2009, regarding FY 2011 Hanford Cleanup Budgets and Priorities, and your continued interest in the cleanup work at Hanford. Please see enclosed our responses to your advice.

If you have any questions, please contact Paula Call, RL, at (509) 376-2048 or Lori Gamache, ORP, at (509) 372-9130.

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U.S. Department of Energy

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HAB:PAC

Enclosure

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**RL and ORP Responses to HAB's Advice #221, "Fiscal Year (FY) 2011 Hanford Clean-up Budgets and Priorities"**

***HAB advice:*** DOE-RL and DOE-ORP should develop and submit fully compliant Integrated Priority Lists (IPLs) that identify and request all the funds necessary to meet existing Tri-Party Agreement (TPA) milestones and regulatory requirements.

- *Where USDOE reasonably believes that a relaxed milestone may replace current requirements, it can identify that in a footnote, rather than reducing the funding request and failing to identify the existing compliance requirements.*
- *All funding required to meet the TPA and regulatory requirements should be within the target budget, and requested by both field offices and by USDOE Headquarters to Congress.*

**Response:** The U.S. Department of Energy, Richland Operations Office (RL) and the U.S. Department of Energy Office of River Protection (ORP) do submit compliant budget requests. The budget requests are supported by the development of Integrated Priority Lists consisting of Analytical Building Blocks – all in accordance with U.S. Department of Energy Headquarters (DOE-HQ) direction. When the Tri-Party agencies have negotiated milestone changes – based upon their collective understanding of the activities necessary to complete cleanup work, shared cleanup priorities, and anticipated funding, the U.S. Department of Energy (DOE) may submit a funding request based upon proposed Tri-Party Agreement (TPA) milestone changes.

The Tri-Party agencies and the Hanford Advisory Board (HAB) have recognized and identified the need for a tool to better understand Hanford cleanup activities, costs, and schedule impacts over the long term. The proposed Settlement Agreement that recently underwent public comment proposes a Lifecycle Scope, Schedule, and Cost Report milestone. This milestone will require DOE to develop an annual report with detailed cost estimates that takes into account all the actions necessary to meet all applicable environmental obligations, including those under the TPA. Although this milestone has not yet been finalized, we have already formed a Tri-Party agency working team to discuss and prepare the first Lifecycle report. We are considering the values of tribal nations, the State of Oregon, the HAB, and other stakeholders as we develop the report. We believe the report will be a tool for setting realistic TPA milestone schedules and budgets.

***HAB Advice:*** USDOE-RL and USDOE-ORP should plan for characterization of waste sites (e.g. tank releases for USDOE-ORP and the 40 miles [DOE editorial note – the correct metric is 1.2 square miles] of unlined trenches of buried waste on the Central Plateau) and identify funding to carry out characterization activities on a pace supporting remediation of all non-tank farm units by 2024 and meeting other pertinent milestones.

- *USDOE-RL's funding should ensure that Central Plateau and remote-handled Transuranic (TRU) waste sites are characterized to meet new proposals for acceleration, as well as existing milestones. Without ARRA funds in 2012 to 2015, it is vital that River Corridor work be completed on time and on budget so that base funding can move to these other projects.*
- *Groundwater funding should include accelerating 300 Area groundwater remediation to match the public expectation fostered by USDOE that the River Corridor will be cleaned up by 2015.*

**Response:** As part of the overall cleanup strategy for Hanford, we are working aggressively to achieve the 2015 vision for a safe and effective cleanup that protects the Columbia River and reduces the active site cleanup.<sup>1</sup> The 2015 goal is to complete waste site cleanup and removal of excess facilities, and implement groundwater remediation systems for the River Corridor. Groundwater remediation will continue after waste sites have been remediated and facilities have been demolished. Achieving the 2015 vision allows a greater focus on Central Plateau cleanup beginning in 2016.

To better prepare for that transition, DOE developed a Central Plateau Cleanup Completion Strategy. Over the past year, the Tri-Party agencies have discussed the concepts and ideas within that draft strategy with tribal nations, State of Oregon, HAB, and other stakeholders. The agencies have considered feedback received from these interactions during TPA negotiations focused on Central Plateau cleanup milestones. This feedback will also be reflected in a Revised Central Plateau Cleanup Completion Strategy that will be issued after the draft TPA change packages have undergone public comment and have been finalized.

We have participated in numerous discussions with the HAB about waste site characterization and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) decision-making process. We plan to continue those discussions at future workshops on the 200-PW-1/3/6 and CW-5 and the Solid Waste Burial Grounds.

Groundwater cleanup remains one of Hanford's highest priorities. In spring 2009, the Tri-Party agencies proposed and subsequently adopted 29 new and accelerated groundwater milestones. One of the milestones was to accelerate by three years (December 31, 2018 to December 31, 2015) to have in place a remedy designed to meet Federal Drinking Water Standards for uranium throughout the groundwater plume in the 300-FF-5 Operable Unit (OU) (M-016-110-TO5). We restated our cleanup goal to ensure Hanford groundwater meets drinking water standards at the Base Assumptions Committee of the Whole meeting in December 2009.

ORP's plans for characterization and interim measures focus on the two areas of Waste Management Area (WMA) C closure support and interim measures to help mitigate additional groundwater insult at selected tank farms.

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<sup>1</sup> It is important to clarify that reducing the footprint of active cleanup does not mean DOE intends to physically reduce the site boundaries or excess the land. It would, however, result in making some areas available for DOE's reuse consistent with the existing Hanford Comprehensive Land Plan Environmental Impact Statement and Record of Decision (ROD) (64 FR 61615), which established the Comprehensive Land Use Plan. DOE anticipates that the Hanford Site will remain under Federal ownership, with DOE control and accountability for the foreseeable future.

Closure of WMA C is required in 2019 as part of the draft change package under review. In order to achieve this goal, an aggressive program of soil characterization is currently being pursued in and around C tank farm, including direct push logging and sampling of multiple locations. Soil characterization in and around C tank farm will be completed by 2013. In parallel, possible soil remediation methods are being evaluated to provide a corrective measures study for WMA C.

The characterization of WMA C and other potential barrier sites at selected west and east Tank Farms is being integrated with RL efforts both to characterize waste sites and to monitor the groundwater, including coordinated planning of new groundwater wells via Multiproject teams under the Groundwater-Vadose Zone Project.

Several technology development/implementation efforts are also underway to improve future characterization of soil in WMA C and other tank farms. These include developing and testing a prototype beta detection tool to look for technetium-contaminated soils and geophysical methods to guide exploration and to assess extent of contamination using resistivity below the tanks and deep in the vadose zone using innovative deployment of deep electrodes. A field test of the best available technology will be performed in 2010.

Interim measures, particularly interim surface barriers, are the other key focus area. An interim barrier is currently being constructed over all of TY Tank Farm and an adjoining tank farm pipeline leak (to be completed by September 2010). Additional soil characterization is underway in S Farm, and planned for BY Farm in 2010 and 2011. This characterization includes both direct push logging/sampling and the use of resistivity measurements deploying surface and deep electrodes. Based on the results of characterization, it is possible that four additional barriers will be designed between 2011 and 2014, and built between 2012 and 2015.

***HAB Advice:*** *Multiple Records of Decision are needed to ensure proper characterization of waste sites and work plans that take into account potentially dramatic differences between units on the Central Plateau (Inner and Outer Areas). Budget and schedule baselines should not be based on assuming that there will be a single Record of Decision for the Central Plateau Inner and Outer Areas.*

***Response:*** The agencies are aware of the HAB's concerns about reducing the number of Central Plateau Record of Decisions (RODs). DOE is looking for ways to make the decision-making process--and the ensuing cleanup--more comprehensive and efficient. Moving to larger decision units is not an attempt to do less rigorous cleanup. Each waste site within each OU will be evaluated using the nine CERCLA criteria.

We have heard general support for grouping cleanup decisions by geographic area rather than process waste. We considered this feedback during recent negotiations concerning TPA milestones for Central Plateau cleanup, reflected in the TPA Tentative Agreement and proposed milestone changes that are currently undergoing a formal public comment period.

***HAB Advice:*** *USDOE-RL should budget using assumptions that significant portions of pre-1970 buried or disposed TRU wastes will be retrieved [DOE Editorial Note: It is incorrect to*

refer to waste disposed of before 1970 as "TRU waste". Radioactive waste disposed before the 1970 Atomic Energy Commission policy created the TRU waste category is correctly referred to as 'radioactive low level waste']. *This requires adequate funding for characterization of scores of waste sites. Therefore, the IPL should include identification of funding necessary for characterization of these sites – even if it places the total USDOE-RL budget above the target budget.*

**Response:** DOE's current priorities are to complete active cleanup of the River Corridor, continue aggressive groundwater cleanup and shrink the active site cleanup footprint. In the coming months we will be meeting with the HAB to discuss the decision-making process for the Solid Waste Burial Grounds and the PW-1/3/6 and CW-5 waste sites. Budget requests will stem from remedies selected through the CERCLA process; i.e. approved CERCLA Remedial Investigation/Feasibility Study work plans, ROD and Remedial Action Work Plans.

**HAB Advice:** *DOE-RL should request an increased target budget to include all funds needed to meet the current TPA milestones and other compliance requirements for 1) contact-handled TRU retrieval; 2) beginning the retrieval of remote-handled TRU; 3) having a facility capable for treating remote-handled TRU; 4) mixed waste treatment; and 5) characterizing waste sites with chemical and pre-1970 TRU miles [please see previous DOE editorial note].*

**Response:** Funding received through the American Recovery and Reinvestment Act (ARRA) is allowing for continued progress on the retrieval, certification, treatment, and shipping of mixed transuranic (TRU) waste and mixed low-level waste in FY2009, FY 2010, and FY 2011. Shipments of contact-handled TRU waste to the Waste Isolation Pilot Plant resumed in March 2010 and will continue at an accelerated pace through the end of FY 2011. Funding from ARRA has allowed RL to plan the design for the retrieval and packaging of the alpha caissons remote-handled TRU waste using a mobile hot cell technology.

The Tri-Party agencies have recently completed negotiations and signed a Tentative Agreement and proposed TPA milestone changes for the mixed waste treatment and disposal activities which are documented in the TPA as the "M-091" Milestone series. The proposed milestone changes are currently undergoing public review. The FY 2012 budget submittal will include compliance case funding scenarios to provide for continued work in this area.

**HAB Advice:** *Fully funding 618-10 and 11 burial ground remediation planning and startup to meet TPA milestones.*

**Response:** The work to remediate the 618-10 and 618-11 burial grounds is part of the River Corridor Closure Contract and is fully funded by DOE to meet TPA milestones. However, start of remediation has been delayed due to the lack of waste characterization data that is required to plan for and safely perform the work. Obtaining the characterization data has been accelerated by ARRA funding and nonintrusive characterization of the 618-10 burial grounds is almost complete. Characterization of the 618-11 burial ground is scheduled to start in FY 2011. DOE is planning to start remediation of the 618-10 burial ground in FY 2011 and is challenging the contractor to complete both sites (618-10 and 618-11) by 2015. Planning is also underway to procure a mobile hot cell to retrieve remote-handled waste stored in the 200 Area caissons.

Operating experience gained through deployment of the mobile hot cell could be directed to the retrieval and potential processing of other remote-handled waste including remediation of the 618-10 and 618-11 burial grounds vertical pipe units and caissons.

***HAB Advice:*** DOE-RL is making good progress at the K Basins with removal of the K East Basin to be complete this year. New TPA milestones have been adopted and a new technical approach has been developed to characterize the remaining sludge material so that it can be removed from K West Basin. This project should be adequately funded to meet the milestones and complete the project.

***Response:*** Cleanup of the K Basins and associated waste sites is key to completing cleanup of the River Corridor and achieving DOE's 2015 vision. Reducing the risks associated with 100-K Area, including the sludge and basin, remain high priorities for the agencies. To-date, the project has received sufficient funding to complete remedial actions and meet the TPA milestones.

***HAB Advice:*** DOE-RL should apply lessons learned from K Basins and other complex decommission and demolition projects to the Plutonium Finishing Plant cleanout and demolition.

***Response:*** We agree. DOE encourages its contractors at the complex and site level to look for ways to share and implement lessons learned, especially in the area of decommissioning and demolition (D&D). The as low as reasonably achievable (ALARA) Center of Excellence, located in the Hanford Site's 200 Area, is a service focused on supporting project safety, radiological engineering, ALARA, and D&D challenges. While the focus of the ALARA Center has been at the Hanford Site, ALARA Center staff routinely exchange information and ideas with others throughout the DOE complex for the mutual benefit of all. The Center also maintains the Society for Effective Lessons Learned Sharing database of lessons learned. The results of such coordination efforts and resources are enhanced safety, greater efficiency, and reduced costs.

***HAB Advice:*** DOE-ORP should make available a more detailed breakout of its IPL, rather than showing the majority of all of its non-WTP funding as a single line item in the IPL at \$239 million.

***Response:*** The Integrated Priority List (IPL) is prepared in accordance with DOE-HQ requirements and represents a prioritization of Analytical Building Blocks, which are summations of lower level work breakdown elements. The \$239 million that the Board is referring to is for Tank Farm minimum base operations. As the term "minimum base" implies, these are the programs and activities necessary to assure safe and efficient operations of the Tank Farms. Although ORP has and may continue to brief the Board on the components of this portion of Tank Farm funding, the IPL will not be modified to reflect that level of detail, and ORP will not attempt to prioritize these sub-items.

***HAB Advice:*** DOE-ORP should develop technologies viewed as having significant potential to make additional space available in double shell tanks (with ARRA funding in FY 2009 and FY 2010). DOE-ORP should request additional funding in the FY 2011 budget to deploy multiple units (e.g. wiped film evaporators) to enable DOE-ORP to make additional space available for

*SST waste retrieval. These funds should be included in the IPL now to avoid a year of delay after testing is completed. The Board also urges DOE-ORP's investment in projects to accelerate the retrieval, processing and disposal of wastes from the existing SSTs.*

**Response:** Maximizing double-shell tank (DST) space is a high priority for ORP, and we agree that more space must be created through evaporation campaigns and technology development. As we continue to develop and deploy tank technologies, such as the wiped film evaporator, we will evaluate the benefits and costs of multiplying these efforts in subsequent budget requests. Early work using simulated tank waste on a pilot-scale version of the wiped film evaporator showed promise. In FY 2010, technology development funding will be used to test the pilot scale version in a hot cell using actual tank waste. ARRA funding is being used to construct a larger version of the wiped film evaporator for further testing. It should be understood however, that wiped film evaporation technology will primarily supplement the capabilities of the 242-A Evaporator, reducing the project risks of a failure of this substantial facility. Use of wiped film evaporators will not, by themselves, create large amounts of additional DST space for more single-shell tank retrievals.

**HAB Advice:** *DOE-ORP should begin funding in FY 2010 for the work required to define the path forward and support a decision on supplemental treatment facility by 2012 to assist in completing its mission. Having a supplemental vitrification facility available shortly after WTP begins operations is important for processing that portion of low activity waste for which the WTP Low Activity Waste facility will not have capacity. Additionally the Board suggests the inclusion of over target proposed expenditures based on need and public priorities if additional funds become available.*

**Response:** The External Technical Review of System Planning for Low-Activity Waste (LAW) Treatment at Hanford determined that a decision on how to proceed with LAW supplemental treatment is not needed until 2017. Further, the proposed settlement agreement and consent decree require DOE to make a decision on supplemental treatment no later than April 30, 2015. ORP feels it has ample time to determine a path forward on supplemental treatment options, and that a push to make this decision years ahead of schedule could potentially offset funding for the Waste Treatment and Immobilization Plant (WTP) design and construction. Even as ORP focuses on WTP construction, preparations for WTP operations, tank retrievals, and tank integrity, significant effort is being applied to improving the tank waste treatment flow sheet.

**HAB Advice:** *DOE-ORP should involve the Washington State Department of Ecology in setting priorities for the development and deployment fund of \$50 million in technology development. The Board supports DOE-ORP's request for this investment in waste processing technology development.*

**Response:** The \$50 million technology development funding was not used for ORP purposes only, but rather was coordinated by DOE-HQ's Office of Environmental Management (EM) and applied to several technology development needs for tank waste treatment across the DOE complex. Development topics included waste retrieval and closure, alternative waste pretreatment, advanced unit operations, improved vitrification capacity, and increased waste loading. For FY 2010, \$20.4 million will be applied specifically to improving Hanford tanks



cleanup. ORP will continue to seek and consider input from all stakeholders, including the Washington State Department of Ecology, as we develop and implement new tank waste retrieval and treatment technologies.

***HAB Advice:*** DOE-ORP should include planning and design funds for a waste blending facility for WTP. DOE-ORP should continue to conduct pilot scale testing of processing stimulants in existing facilities and moving on to test real waste in pilot scale facilities.

**Response:** EM has adapted the Department of Defense technology maturation process for DOE use and has already conducted an extensive testing program to underpin the Pretreatment (PT) Plant design. Both real waste and waste simulants are used for bench scale testing, while waste simulants alone are used for pilot scale tests.

All key PT Facility unit operation technologies that are first of a kind or represent a significant technology extrapolation have been, or are being, tested at pilot scales between approximately one-tenth and one-half scale. Examples of pilot scale testing supporting the Pretreatment Facility design include:

- Pretreatment Engineering Platform Testing - Used an integrated test platform to demonstrate the core pretreatment leaching and ultrafiltration unit operations with waste simulants. Completed successfully.
- Ion Exchange Process Testing - Used pilot scale testing to demonstrate RF resin ion exchange technology. Completed successfully.
- Line Plugging Testing - Used pilot scale testing with waste simulants to confirm the adequacy of piping designs for waste slurry transport piping. Completed successfully.
- PJM Control - Used pilot scale testing with waste simulants to evaluate planned technology for PJM control. Completed successfully.
- Erosion - Used pilot scale testing with waste simulants to evaluate erosion and establish related design margins. Completed successfully.
- Waste Sampling - Used full scale testing of autosampler technology with waste simulants to validate design. Completed successfully.
- PJM Mixing - Used pilot scale testing with waste simulants to underpin the design of vessels processing non-Newtonian waste. Completed successfully. Currently completing pilot scale testing with waste simulants to validate design improvements for vessels processing Newtonian wastes with rapidly settling particulate.

ORP plans to evaluate the need for further integrated and/or larger scale testing of WTP vessel mixing, transport, sampling, and control & instrumentation systems as a risk mitigation activity. This evaluation will be completed after the current PJM mixing tests are completed and evaluated.