HAB Perspectives: PW-1,3,6 and CW-5 ROD

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From HAB Advice 207

- The early, iterative process which engaged the Board, the tribes and the public should be a model for future decision-making.
- The Board believes that the TPA agencies should commit to adequate characterization of the 200 Process Wastes (PW) 1,3, and 6 and the removal, treatment and disposal to the extent practicable of all these plutonium-rich wastes.
- The TPA agencies should ensure that soils contaminated with Transuranic elements disposed of prior to 1970, po8t-1970 Transuranic (TRU) waste, and mixed TRU waste will be retrieved and have a pathway for disposal into the Waste Isolation Pilot Plant.

From HAB Advice 207 (cont'd):

Considerations important for 200-PW-l, 3,6 and Proposed Plan development

Decision Process

- Use this model of collaborative decision-making with early Board (Committee of the Whole), public and tribal involvement in future cleanup decisions, especially at the scale of zone closure.
- Use all pertinent Board advice to define the extent to which remediation is necessary and to develop remediation alternatives. In particular, use the Central Plateau Remedial Action Values Flowchart in Hanford Advisory Board Advice #173 and #174, and the Groundwater Values Flowchart in Hanford Advisory Board Advice #197.
- Apply the requirements of all applicable regulations in one process to meet the requirements and goals of each (e.g. Comprehensive Environmental Compensation and Liability Act; Resource Conservation and Recovery Act).
- Integrate remediation actions on these waste sites with neighboring sites and facilities utilizing the "zone closure" concept. Ensure that the decisions integrate well in both timing and in actions.

From HAB Advice 207 (cont'd):

Considerations important for 200-PW-l, 3,6 and Proposed Plan development

Analysis and Data Quality

- Evaluate and include the full range of life-cycle costs for each alternative.
- Assess available science and technologies and assess needs for additional technologies. See related Board Advice #156 and #204.
- Identify and evaluate the implications of uncertainties inherent in the data and analytical procedures used.
- Use validated modeling tools that incorporate all significant fate and transport effects known or suspected to occur at Hanford.
- Ensure that assumptions inherent to the alternatives are validated. Do not bias alternatives on expected outcomes.
- Evaluate the effect of alternative discounted cash flow values, including non-discounted values in life-cycle cost analysis.
- Use good science to determine whether plutonium is mobile and ensure groundwater is not an exposure pathway.
- Run hazard analyses for long-lived radionuclides out to 1000 years.
- Evaluate implementation of mining and construction technologies and techniques rather than assuming that large lay-backs of soil are required.

From HAB Advice 207 (cont'd):

Considerations important for 200-PW-l, 3,6 and Proposed Plan development

Decision Criteria

- Decisions should be based on adequate characterization. Retrieve and treat wastes and contaminated soils (especially long-lived radionuclides with Transuranic elements such as plutonium) to meet goals for permanent remedies consistent with our prior advice and values.
- Do not rely on institutional controls or physical barriers to human intrusion unless there is no other practicable remedial option.
- Do not rely on barriers to prevent the migration of contaminant plumes unless there is no other practicable current remedial action.
- Do not leave wastes in the soil that pose any significant risk for use in nuclear weapons or dirty bombs.

From HAB Advice 247

Background

- The draft "Proposed Plan for the Remediation of the 200-CW-5, 200-PW-1, 200-PW-3, and 200-PW-6 Operable Units" (Draft Plan) discusses the proposed remediation of 22 waste sites within the 200 Area of the Central Plateau. The 200-PW-3 Operable Unit (Cesium Sites) includes four Plutonium Uranium Extraction Plant cribs and one unplanned release, all containing primarily cesium-137 in the 200 East Area. The remaining 17 waste sites (PW-1, PW-6) are cribs, ditches, and other miscellaneous release sites associated with the plutonium recovery activities in the 200 West Area. The nature and extent of the nitrate plume and technetium-99 contamination is not understood.
- The Hanford Advisory Board (Board) adopted Advice #207 outlining criteria for development of this Draft Plan. The Board's commitment to the values, considerations and criteria in that advice is unchanged.
- The Draft Plan proposes to cover the cesium waste sites in 200-PW-3 with additional soil to achieve a 15-foot thick "cap" thought to be protective of human health for 300-400 years of institutional control. The Board disagrees with this solution.

From HAB Advice 247 (cont'd)

- Remove/Treat/Dispose (RTD) approach for this waste is consistent with the Board's Central Plateau Remedial Action Values Flowsheet (Advice #173).
- In the case of the five Cesium Sites, most of the cesium-137 appears to be accessible within the top 15 feet of the disposal site, which would make these sites a good candidate for RTD. The configuration of these waste sites provides an excellent opportunity to remove the clean top soil in order to access the concentrated layer of radionuclides.
- In addition, the Draft Plan proposes to apply the RTD approach to the Z ditches in the 200 West Area by mixing clean top soil with lower layers of soil containing concentrated plutonium (blending) to qualify for disposal at the Environmental Restoration Disposal Facility (ERDF), rather than the Waste Isolation Pilot Plant (WIPP). The Board strongly disagrees with this approach.
- In Advice #207, the Board specifically advised sending as much plutonium to WIPP as possible. Plutonium is "forever." The high salt waste sites typically contain high plutonium concentrations in the near surface, making them candidates for the RTD remedy. Employing RTD for shipment to WIPP is the approach that would remove the plutonium (and the risks associated with that plutonium) from Hanford forever, and would result in a cleaner remediated site with substantially less plutonium permanently disposed in ERDF.

From HAB Advice 247 (cont'd)

- The Board advises the U.S. Department of Energy (DOE) to get as much plutonium out of these waste sites as possible.
- The Board advises DOE to implement a RTD policy for plutonium that emphasizes remediation of plutonium disposal sites. DOE policy should opt to ship eligible plutonium-contaminated soil to WIPP for geological disposal, permanently removing it from Hanford.
- The Board advises DOE to utilize a RTD approach when a high concentration of a radionuclide exists. This approach is consistent with established Board values.
- The Board advises basing remedial design for cleanup of technetium and nitrates upon increased characterization. Extensive sampling is needed to determine the location and extent of technetium and nitrate contamination. This characterization should coincide with remediation efforts.
- The Board advises a policy to conduct RTD concurrently with vapor extraction efforts to ensure meeting Tri-Party Agreement milestones.
- The Board advises the proximity of cesium-137 to the surface necessitates implementing an RTD approach in order to dispose of cesium into the ERDF burial ground.
- The Board advises the Tri-Party agencies to hold public meetings to discuss the draft "Proposed Plan for the Remediation of the 200-CW-5, 200-PW-1, 200-PW-3, and 200-PW-6 Operable Units.

From the ROD (Sept. 2011)

3.0 Comments and Responses

318 comments were received from 122 individuals and groups covering a wide range of topics and varying perspectives. The public comments were separated out and aggregated into the following general categories:

- Excavate and Remove All Plutonium
- Remove All Cesium
- Dig Deeper Than Two Feet in the High-Salt Waste Sites
- Ship Plutonium Off-Site
- Plutonium Is Mobile
- Don't Rely On Barriers/Caps
- Government Is Not Long-term Stewardship
- Don't Rely On Institutional Controls
- Modeling for Seismic Activity, Floods, Climate Change
- Insufficient Scientific Data
- Support for Leaving Cesium in Place
- Public Involvement Process
- Other Comments on the Proposed Plan
- General Comments

From the ROD (cont'd)

- The 200-CW-5 *au,* also known as the Z-Ditches, will use the RTD approach to excavate contaminated soils and debris exceeding cleanup levels to a depth of 15 ft below ground surface (bgs) with disposal at ERDF or WIPP, as appropriate.
- Three of the six 200-PW-l waste sites, also known as the High-Salt Waste Group, will use the RTD approach to excavate contaminated soils and debris located to a minimum of 2 feet below the bottom of the disposal structure (20 ft - 23 ft bgs), with disposal at WIPP or ERDF, as appropriate. After the excavations are filled, an evapotransporation barrier will be constructed over the remaining waste in these waste sites.
- The 200-PW-6 au and three of the six 200-PW-l waste sites, also known as the Low-Salt Waste Group, will use the RTD approach to excavate contaminated soils and debris to a depth of 22 ft to 33 ft bgs, with disposal at ERDF or WIPP, as appropriate. After the excavations are filled, an evapotransporation barrier will be constructed over remaining waste in these waste sites.